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GARDEN AND FOREST

A JOURNAL OF

HORTICULTURE, LANDSCAPE ART AND FORESTRY

Conducted by

CHARLES S. SARGENT

Director of the Arnold Arboretum, Professor of Arboriculture in Harvard College, etc.

ILLUSTRATED

VOLUME IV. JANUARY TO DECEMBER, 1891

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ILLUSTRATIONS.

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The White Oak.

OF the Oaks which inhabit the New World, the White Oak (*Quercus alba*) is most akin to the common and familiar tree of all European countries—the Oak of myths and of poetry, of Dodona and Hercynia, the tree which Celt and Briton worshiped, which shaded the Druids' sacred fire, and has in all times been the emblem of strength and longevity. And here in America, when we think or speak in a general way of an Oak-tree, it is the White Oak which naturally most often presents itself to the mind, as the leaves and fruit of this tree resemble more nearly than those of any of our other species the conventional Oak-leaves and acorns with which we have become familiar from childhood.

The American White Oak is a noble tree. In girth of stem and stoutness of branches it is not second to its Old World relative; and there are very few American Oaks which grow over such a wide stretch of country, or are so generally multiplied. The Burr Oak, perhaps, when it has grown under the most favorable conditions, produces timber which is stronger and more solid than that of the White Oak, but there is no American Oak which furnishes universally and over such large areas such a high quality of timber.

As it grows in the dense forests of the Alleghany Mountains, or of the valley of the lower Ohio, the White Oak sends up a tall and massive stem destitute of branches to a height sometimes of sixty or eighty feet, and crowned with a narrow head of comparatively small branches. In less favorable climates or on thinner soil it is a smaller tree, with a shorter trunk and larger branches, which extend laterally in proportion as the individual has found room for their development.

The White Oak owes its name to the color of the bark, which is light gray or sometimes nearly white on vigorous trees, with a surface broken into long, narrow, rather thin scales. The character of the surface is the same on young and on old trees, and only varies slightly in color on different individuals, and, as it is unlike the bark of any other Oak-tree of eastern America, it furnishes the most ready means for distinguishing this tree at a glance at all seasons of the year. The inner bark, as is the case with that of many other Oaks, possesses astringent properties, and has found a place in our materia medica in the form of decoctions.

The wood of the White Oak is very heavy, a cubic foot of dry wood of average quality weighing rather more than forty-six pounds; it is strong, hard, tough and close grained. The annual layers of growth are marked by numerous rows of the open ducts present more or less in all Oak-wood. The broad and prominent medullary rays are silvery white, and make a handsome contrast with the light brown color of the body of the wood.

The leaves of the White Oak when they first unfold are tinged with red and coated with silvery white tomentum. At this time, when the tree is covered also with its catkins of yellow flowers, the White Oak presents a beautiful appearance in the forest, and is perhaps more distinct and attractive than at any other season of the year. As the leaves grow they lose their hairy covering, and at maturity are quite smooth; they are obovate-oblong in general outline, and obliquely cut into three to nine obtuse, mostly entire lobes, which vary considerably on different trees in number and breadth and in the depth of the sinuses which separate them. These sometimes penetrate nearly to the midrib, making the leaf appear almost pinnatifid. The leaves when fully grown are six or eight inches long by two or three broad, and are borne on stout petioles. Late in the autumn, after the leaves of many of the trees with which the White Oak grows have begun to fall, they turn gradually first yellow and orange and then deep vinous red or sometimes bright scarlet. The brilliancy of their autumn coloring is retained for a long time, and, as the leaves die, they turn gradually brown and fall slowly, many remaining on the branches through the winter and until the buds of another year begin to open.

The sterile flowers, like those of our other Oaks, are produced in slender, naked, hanging catkins, which are single, or often several together from the same lateral scaly bud. The male flower consists of a lobed yellow calyx and six to eight stamens with conspicuous yellow anthers. The female flowers, which are composed of a three-lobed sessile stigma and a three-celled ovary enclosed by a scaly bud-like involucre which grows into the cup of the acorn, are solitary or clustered near the base of the shoots of the year. The fruit, like that of all the so-called White Oaks, ripens at the end of the first season. This character best distinguishes these trees from the so-called Black Oaks, which require two summers for the maturity of their fruit. The acorn when fully grown is sometimes an inch long, or often smaller at the north; it is slender, ovoid or oblong, chestnut brown, and enclosed for about one-third of its length in a pale, hemispherical, saucer-shaped cup, which is covered with tubercles at maturity. The fruit is sessile, or sometimes produced on slender stalks an inch or more long, the two forms appearing occasionally on the same tree—a peculiarity also of the Old World Oak.

The White Oak grows from northern Maine, Ontario and the lower peninsula of Michigan to the shores of Tampa Bay, in Florida. It ranges west to western Missouri and Arkansas, and to the valley of the Brazos River, in Texas. In some parts of this great region it forms more than half of the forest-growth. It is especially abundant in the group of states which contain the ranges of the southern Appalachian Mountains and in the valley of the middle portion of the Mississippi River. The White Oak grows on nearly all soils except those saturated with stagnant water. It attains its greatest size on the rich lands of river-bottoms, and produces in such situations its most valuable timber. Mr. Robert Ridgway, whose excellent observations upon the trees of the Lower Wabash and White River valleys, in Indiana, are published in the *Proceedings of the United States National Museum*, records the measurement of a

number of White Oaks produced on different soils. He found that the average trunk-diameter of ten trees growing on bottom-land was 4.59 feet, and that their average total height was 123.60 feet, while of seven trees growing on gravelly uplands in the same region the average trunk-diameter was 2.40 feet, and the average total height only 99.82 feet.

The White Oak was noticed by the earliest botanists who explored the North American flora. Bannister, the English minister, who died in Virginia in 1692, knew it; Clayton, whose Virginia plants were published by Gronovius, remarked on the resemblance of its leaves to those of the English Oak; and Catesby published in 1731, in his "Natural History of Carolina," the first portrait of the foliage and fruit of this tree. It is said to have been cultivated in England as early as 1724, and Michaux, late in the same century, sent great quantities of the acorns and young plants to enrich the forests of France. Such a valuable tree was naturally sought for by European planters, who a hundred years ago were keener than they are to-day in their search for exotic timber-trees. Efforts to grow it successfully in Europe have, however, always failed; and a good specimen of this or of any of the other American species of the White Oak group is probably not to be found there. The reason of this is not easily explained, for nearly all the Black Oaks, especially the Red Oak, the Scarlet Oak and the Pin Oak, grow rapidly and live as long in Europe as they do in this country. Here the White Oak, although it is a difficult tree to transplant, and is best grown from seed planted where the tree is to remain, grows very rapidly, and is one of the most desirable and ornamental of all our native trees for the embellishment of large parks and gardens.

The value of the White Oak from an economic point of view is not easily overestimated. It supplies the principal part of the American oak of commerce, and is very largely used throughout the country in ship-building, in all sorts of construction, in the manufacture of carriages and agricultural implements, for railway-ties, fencing, cabinet-making, the interior finish of buildings, and for cooperage, fuel, etc. For years it has been exported in immense quantities in the form of staves for wine and other casks, for which purpose there is a large and increasing demand for it in Europe, and in California, where no Oak furnishing wood suitable for this purpose grows. There are still great bodies of this timber standing in the United States, especially in western North and South Carolina and in eastern Tennessee and Kentucky and in Arkansas. Railroads, however, are penetrating these Oak-forests, which inaccessibility has thus far preserved from the axe of the lumberman and the settler. Every year the supply is becoming less, and if it is fair to judge of the future of our forests by their past, white oak as a great forest-product must eventually disappear. The time has already arrived when the White Oak is worth preserving. Few of our trees, indeed, better deserve care, especially as a danger more serious even than the axe is threatening to exterminate the White Oak in the very region where it grows naturally in the greatest abundance. The acorns of this tree, like those of the other Oaks with annual fructification, are, unfortunately, sweet, and are, therefore, hunted for and devoured by the hogs which are allowed to roam at will in great bands through the forests of the southern states. They eat the White Oak acorns and pass by the bitter fruit of the Black Oaks, which are, therefore, gradually getting possession of the soil and driving out more valuable species, so that it will be a question of time only, if the pasturage of the southern forests is continued, when their most valuable tree will disappear.

The density of the original forest-covering of eastern America prevented, except in rare cases, the growth of broad-branched, spreading trees such as we so much admire in some of the old forests and parks of England. There are exceptions, however, and fine old wide-spreading White Oaks are occasionally met with in the eastern states. Such trees are those at Waverly, in Massachusetts, which have already appeared in this journal (vol. iii., p. 81), and such is the tree which appears on pages 6 and 7 of the present issue. It is growing on the grounds of Mr. W. H. Fearing, near Jobstown, New Jersey; the diameter of the trunk is six feet at three feet from the ground, and the branches cover a circle 120 feet across. Larger trunks are not uncommon, but such a magnificent expanse of foliage is rare. The tree is fortunate, too, in having escaped mutilation by wind and storm. It has lost no large limbs, shows no dead or dying wood, and is in vigorous health. Altogether the tree is a fine example of what the White Oak can become under favorable conditions, and what character of trees the people who inhabit America three or four hundred years hence will have before their eyes if the present generation of planters plants wisely, and their descendants value trees for what they are worth and bestow upon them the care they deserve.

Dispatches from Washington state that Secretary Noble has asked the War Department for two companies of cavalry to protect the additions to the Yosemite Park and the Tulare Sequoia Reservation from the dangers that beset all Government forests when not under military control. The presence of troops has alone kept the forests and game of the Yellowstone Park from extermination, and no doubt the visible presence of the force of the Federal authority in the shape of armed and uniformed men will do much to prevent wanton destruction of the nation's property by fire and trespass of various kinds. In spite of the smallness of our army and the vast area over which our public forests are scattered, we still feel that these forests would be safer under the control of the army than under any other administration. As matters now stand, the army is the only force that will be likely to represent with any firmness the dignity of the nation against local interest, and against the right which herders and lumbermen, and, in fact, settlers of all kind, feel they have acquired by long usage, to cut or pasture or burn over the woods on the public lands as it may seem for their profit or pleasure to do so.

Old Methods of Preserving Seeds for Transportation.

The *Gentleman's Magazine* for 1760 and 1769 gives some interesting notes on the methods then employed in treating seeds for long voyages. Four methods are described, one as originating with Linnæus, and the other three with John Lewis, Esq., F.R.S.

Mr. Lewis' first method was tried with acorns of the English Oak, and consisted in wrapping the acorns separately in thin sheets of "common yellow bees-wax," warmed so as to be pliable; then adding a coating of "brewers' loam" moistened with a thick solution of gum-Arabic. The acorns were afterward placed in a "chip box," the interstices being filled with dry "house sand," and the box stowed away in a dry cask, from which, after nearly ten months, they were taken out (on arriving at Georgia) "in a state of vegetation, and being set, soon germinated and grew."

Spanish chestnuts were made to retain their germinating power for nearly a year on a sea voyage by pouring a melted mixture of bees-wax and mutton suet over the nuts in an earthen jar; and similarly by using pure bees-wax. Mr. Lewis laments, however, that in one instance, at least, a supply of chestnuts from Spain failed to grow under this process; but he subsequently learned that the nuts had been "thoroughly kiln-dried" to prevent their moulding on the voyage.

The third process tried is similar to the first, with the exception that the nuts were simply wrapped in small sheets of wax. The bottom of the box to contain the nuts was then covered with melted wax to a depth of an inch, and when the wax became partly cooled the nuts were packed in regular layers and the interstices of the last layer filled up with warm, pliable wax; a wooden cover was then secured over all. The acorns thus encased were placed in a dry closet for one year. At the end of this time they were transmitted for examination "to Mr. William Aiton, botanic gardener to Her Royal Highness the princess dowager of Wales at Kew." Mr. Lewis states that in a letter subsequently received from Aiton the

acorns were found to be in a good state of preservation and when planted germinated successfully.

Mr. Ellis remarks that the above methods may suffice for carrying seeds to and from the East Indies, but that they have not been sufficiently tested for larger voyages, and, therefore, recommends "to the curious" the following method contrived by Linnæus, "which has been tried," and, Linnæus affirms, "has never failed":

"Put the seeds in a cylindrical glass bottle, fill the interstices with dry sand to prevent their lying too close together and that they may perspire freely through the sand; then cork the bottle, or tie a bladder over its mouth. Then take a glass vessel so much larger than the one containing the seeds that when the latter is suspended in it there may be a vacant space on all sides of two inches between the two glasses, which must be filled with four-fifths of nitre and one-fifth of equal parts of common salt and sal-ammoniac, well pounded and mixed together. This saline mass, which should be rather moist, will always be so cold that the seeds in the inner glass will never suffer during their voyage from the heat of the sun."

Mr. Ellis concludes with these judicious words: "Perhaps Dr. Linnæus' method will answer the end. I think it worth the trial, especially as he assures us it never fails." To this the editor comments with some warmth: "This seems to be an insinuation to the prejudice of Linnæus' character, the publication of which the reader will the less approve when told that this very method was communicated by Linnæus in a letter to Mr. Ellis in consequence of Mr. Ellis having applied by letter to him for information on this subject."

Washington, D. C. *George B. Sudworth.*

Cranberries in Wisconsin.

IN former issues we have given at some length accounts of the Cranberry as it is cultivated in the bogs of Cape Cod and New Jersey. The following article on the Cranberry in Wisconsin was prepared by Professor Goff and published in a recent number of the *Farmer's Review*:

In several central counties of Wisconsin are extensive marshes, in which the Cranberry-plant is indigenous. From time immemorial the Indians of the country have feasted upon this grateful fruit in its season, and from the first settlement of those regions, farmers, lumbermen and others, at least in productive years, gathered their full winter's supply of cranberries from the spontaneous harvests. But not until the railway had penetrated these wilds did any quantity of the fruit ever reach an outside market, or were the rudest attempts made at improving the marshes, or at introducing the most primitive culture. The crop borne, bountiful in some seasons and very scanty in others, was entirely at the mercy of the elements. When these were favorable the ungathered harvest returned to the soil that gave it by the thousand bushels. But fire or drought or untimely frosts often so far cut off the yield that only the leisurely Indian found time or patience to avail himself of it. It is scarcely more than twenty years since the first systematic attempts were made at improving these extensive marshes, or at gathering the fruit on a commercial scale. A few years previous to 1870 interest began to be awakened in Cranberry-culture in the vicinity of Berlin, in the eastern part of the state, and the more available tracts of Cranberry-land began to be improved in a primitive way by clearing out brush and fallen trees and excavating ditches for the better control of the water. A few years later (about 1873) railroads were extended eastward and west across the central part of the state, which opened up hundreds of square miles of native Cranberry-marshes. The success that had been attained in the neighborhood of Berlin gave a stimulus to the industry in this new field, and soon capital and enterprise began to be attracted there.

From that time to the present the business has shown a gradual, but tolerably steady advance, both in the area cultivated and in the methods, until at last the output of cranberries in the average season amounts to about 5,000 barrels. The greater part of this aggregate, however, is as yet gathered from wholly unimproved marshes. How long this increase will continue it is impossible to estimate. The market for cranberries may be considered as almost unlimited, and if all the Wisconsin marshes were available for improvement the present annual product might be multiplied by thousands. But while one may in places ramble ten miles in a straight line over continuous native Cranberry marshes, the conditions are such that only the areas lying near the railroads can be profitably improved. Owing to the quaggy nature of the soil of the marshes horses are scarcely available either for traffic or labor, and it will only be after the construction of costly roads that the marshes located at a distance from the railways can be utilized. At present the locations adjoining the railroads that are fortunately situated as regards water supply are for the most part in a fair state of improvement.

The methods of culture practiced in Wisconsin are of a much more primitive kind than those in use at Cape Cod and in New Jersey. Very few of the Wisconsin marshes that are considered improved have ever been systematically planted. The "improvements" consist simply in clearing out foreign rubbish and in ditching the ground, so that the water may be under some system of control. Very few of the marshes have conveniences for flooding at pleasure, and the number that have been "turfed" and systematically planted is perhaps still smaller. The "turfing" consists in breaking up the tough sod of the marshes at a dry time, and piling the turf into heaps for burning. This destroys most of the native plants that interfere with the growth of the Cranberry-shrub, and leaves the ground in a smooth condition for planting. The process of sanding the marshes, so common in the east, has scarcely been attempted in Wisconsin. Sand is rarely sufficiently available in the marshes to make the expense warrantable, and it is, indeed, a question if much would be gained by the process. The comparatively few Cranberry-beds that have been planted in Wisconsin have been set with the native plants of the locality. Little attention has as yet been paid to varieties. In the Berlin district a very large and fine bugle-shaped variety is native and has been considerably planted in that part of the state. In the marshes situated in the more western districts this variety abounds to some extent, but is so much mixed with others as to render the separation of the plants a difficult task. I was informed by persons who are familiar with the Cape Cod and New Jersey marshes that nearly all the varieties grown there are to be found wild in Wisconsin.

It cannot be denied that the northern latitude and the consequent danger of early frosts is a drawback to Cranberry culture in Wisconsin. But experience shows that this drawback is by no means fatal to success. In the more improved marshes, where the ground is kept free from grass, and so becomes, to some extent, warmed by the sun, frosts are found to be less injurious than in the wild ones. Where the marshes can be promptly flooded, injury from frosts may be effectually prevented, and some of the other means that have been tried to prevent frost injuries promise good results. One of these, used the past season on the extensive marshes of Messrs. S. & A. S. Mills, at Millsonia, Monroe County, is especially promising and worthy of being described in detail. The hay that is cut during the summer upon the embankments along the ditches is left in small piles, where it partially dries and partially decays. By the time the frosty season arrives this hay is in just the condition to burn gradually, with a great deal of smoke and vapor. But the use of smoke as a preventive of frost is by no means new. The part that is original with the Messrs. Mills is the means used to compel the smoke to drift over the marshes instead of being wafted away by the breezes, as so often happens where this method is tried. A large number of campaign torches are set up at distances of a few yards from each other throughout the central part of the marsh, and as the wet-bulb thermometer gives its frost warning, the grass piles and the torches are lighted simultaneously. The heat generated by the torches is soon sufficient to start an upward current of air at the centre of the marsh, which immediately causes an inward counter current at the surface of the ground. This wafts the smoke, steam and warmed air from the grass-fires around the borders of the marsh inward toward its centre, and the result is that the marsh is hovered over by something of the nature of a thin summer cloud.

While it cannot be claimed that this method of protection from frost has been sufficiently tested, it was used the past autumn on the marshes of the Messrs. Mills with apparently complete success. The torches possess one important advantage over the other means that have been proposed for preventing frost by means of fire, viz., they can be used amid growing crops without in the least endangering them. If it must be confessed that the methods of the Wisconsin Cranberry-growers are somewhat of the slipshod order as compared with the more prim and expensive practice of the Eastern fraternity, it must be admitted that the growers themselves are not lacking in enterprise when the main question is at stake. They have a wide-awake State Association which holds its annual meeting in August to form estimates of the yield and agree upon a schedule of prices. To show that these estimates are more than haphazard guesses, I mention that in the scant cranberry-crop of 1889, the total estimates,

which amounted to something more than 20,000 barrels, were within 16 barrels of the actual output of cranberries for the year, and the estimates of the previous year were nearly accurate. No good reason appears why the cranberry interest of Wisconsin should not, when fully developed, rival any other interest of this progressive state. Already the importance of the industry is attracting eastern capital to some extent, and as new railroads open up tracts of Cranberry-land not yet available for improvement, the business will unquestionably be much extended. The fine keeping quality and color of the Wisconsin fruit is rapidly making for it a place in the markets, while the ease with which the marshes are improved and cared for will render successful competition with the more limited Cranberry-regions of the older states a comparatively easy matter.

Notes on North American Trees.—XXI.

A south Florida and West Indian tree which has often been referred to *Myginda integrifolia* of Lamarck differs in such important characters from the other species of this genus, as Kunth and Grisebach pointed out long ago, that it hardly seems possible to unite it with them without greatly emending the characters of the genus as generally limited to receive it. The unisexual flowers, cup-shaped, fleshy disc, two-celled ovary, suspended ovules and seed, appear to sufficiently distinguish this plant generically; and I should propose for it the name of Gyminda,* the name of a section of Myginda established by Grisebach (*Cat. Pl. Cub.* 55) for our plant.

The genus is an anomalous one with many affinities, as Kunth pointed out, with *Ilicineæ*, from which, however, the prominent cup-shaped disc of the flower and the opposite leaves separate it; while it differs from all the American *Celastraceæ* in its solitary suspended ovules.

A specific name must be found, too, for an examination of the specimen (without flower and with a single fruit only) in Lamarck's herbarium, now in the Museum in Paris, upon which he founded his *Myginda integrifolia*, shows that it is not a Myginda at all but the *Rhamnus ferrea* of Vahl now referred to Condalia by Grisebach, so that *Myginda integrifolia* must become a synonym of that plant. Nothing, therefore, stands in the way of associating with our tree the name of the distinguished botanist Grisebach, who appears first to have understood its peculiar structure and monotypic character. The rather complicated synonymy of this plant as I now understand it is:

Gyminda Grisebachii.

Myginda integrifolia, HBK., *Nov. Gen. & Spec.* vii. 66 (not Lamarck, *Dict.* iv. 368).—De Candolle, *Prodr.* ii. 243.—Grisebach, *Cat. Pl. Cub.* 55.—Sargent, *Bot. Gazette*, xi. 314.—Trelease, *Proc. St. Louis Acad.* v.

M. pallens, Sargent, *Forest Trees N. Am. 10th Census U. S.* ix. 38 (not Smith).

M. latifolia, Chapman, *Fl. S. States*, 76 (not Swartz).—Trelease, *Trans. St. Louis Acad.* v.

There is a form with rather smaller and more broadly obovate, thinner and very glaucous leaves, found in Cuba by Charles Wright (No. 81ª) and distinguished by Grisebach as *Myginda integrifolia glaucescens*. For this *Gyminda Grisebachii*, var. *glaucescens*, would be the varietal name.

The Florida Myginda (Palmer, Key West, 1874, No. 81; Curtiss, No Name Key), referred usually to *M. pallens*, Smith (see Chapman, *Fl. Southern States*, Suppl., 612.—Trelease, *Proc. St. Louis Acad.* v.), turns out to be *M. latifolia* of Swartz, to which, I suspect, Smith's plant also belongs. Professor Wittrock, of Stockholm, has most obligingly compared a specimen of the Florida plant with the type of *M. latifolia* preserved in Swartz's herbarium and finds them identical; and his conclusions are confirmed by a leaf from Swartz's plant with which I have been favored.

C. S. Sargent.

Gyminda, Nov. gen. Celastracearum. Flores dioici. Calyx parvus, tubo brevi urceolato, lobis 4, rotundatis. Discus cupularis, crassus, 4-lobus. Petala 4, rotundata, reflexa. Stamina 4, inter disci lobos inserta; filamentis subulatis, incurvis, excertis; antheræ oblongæ, introrsæ, 2-locularæ, loculis confluentibus, longitudinaliter dehiscentibus. Ovarium, oblongum, sessile, cum disco confluens, 2-loculare; stylus 0; stigma terminale, 2-lobatum; ovula, in loculis solitaria, ab apice loculi pendula; raphe dorsalis. Fructus parvus, obovatus, drupaceous, carne parca, putamine crustaceo, 2-loculari. Semina pendula; testa membranacea, albumine carnoso. Embryo linearis, axilis; cotyledones ovatæ, amplæ; radicula supera, hilo proxima.

Frutex vel arbor glabra. Folia opposita, oblongo-ovata, ad apice rotundata vel emarginata, integerrima, vel crenata, margine crasso revoluto, brevita petiolata, coriacea, sempervirentia. Stipulæ parvæ, caduceæ. Flores bi-bracteatæ minuti, subcymosi, pedunculis, axillaribus, dichatome pauci-floris. Fructus nigrus vel coerulescens. Species unica. Antillana et Floridana.

Gyminda Grisebachii.

New or Little Known Plants.

New Orchids.

Cattleya granulosa, var. Buyssoniana, O'Brien, is a beautiful variety with ivory-white sepals and petals, and the front lobe of the lip rose-crimson, with some yellowish markings. A plant was exhibited by Messrs. Linden, L'Horticulture Internationale, Brussels, at a meeting of the Royal Horticultural Society on October 14th last, when it received an award of merit.—*Gardeners' Chronicle*, October 18th, p. 447, and November 22d, pp. 588, 589, Fig. 116.

Dendrobium × Cassiope, Rolfe, is a very pretty little hybrid raised by Mr. Norman C. Cookson, of Wylam-on-Tyne, from *D. Japonicum* fertilized with the pollen of *D. nobile abliflorum*. The flowers are pure white, with a clear maroon-purple throat to the lip. It can well be compared with *D.* × *euosmum* and *D.* × *endocharis*, two of the most elegant little hybrids yet raised.—*Gardeners' Chronicle*, November 29th, p. 620.

Cattleya superba, var. alba, Rolfe, is a most beautiful pure white variety, discovered and cultivated by Mr. Edward S. Rand, of Parà, Brazil. It is to be hoped that a stock of it will in time appear.—*Gardeners' Chronicle*, November 29th, p. 620.

Cypripedium × Arnoldianum, Manda, is a distinct and pretty hybrid raised from *C. superbiens* and *C. concolor* by Joseph Manda, Jr., of Short Hills, New Jersey, U.S.A. It is said to have flowered when less than two years old, the quickest time on record for a Cypripedium. The flowers are lemon-yellow, with vinous purple nerves on the dorsal sepal, some dark spots on the petals, and some deep vinous purple veins and dottings on the front of the lip. The staminode is lemon-yellow with purple border.—*Gardeners' Chronicle*, November 29th, pp. 632, 633, Fig. 123.

Cirrhopetalum Mastersianum, Rolfe, is a pretty little species introduced from the Dutch Indies by Messrs. Linden, L'Horticulture Internationale, Brussels. It is allied to *C. gamosepalum*, Griff. The peduncles are reddish crimson and the flowers orange-yellow, with brownish crimson lines, except on the upper half of the lateral sepals; the lip is purple-brown.—*Lindenia*, vi., p. 33, *t.* 255.

Kew. *R. A. Rolfe.*

Cultural Department.

Notes on Some Hardy Wild Roses.—I.

In a standard work on Roses, by an eminent authority and pleasant and entertaining writer, the wild type of our Roses is spoken of as "fit only for the road-side." But this statement was made before the general introduction of that exceedingly hardy and handsome species, the *Rosa rugosa*, from Japan, and its still more beautiful white variety known as *Rosa rugosa alba*. A typical Wild Rose may be said to be any single flowered wild species which has not become much changed or modified by cultivation or artificial treatment at the hands of man. Semi-double forms and plants having unusual peculiarities are sometimes found growing wild, but they are exceptional, and, as a rule, abnormal. Although always admired and sought for and furnishing a theme for many a poem and homily, these single species remain comparatively rare in our gardens, being quite supplanted by the vast number of hybrids and other double Roses of artificial origin. But besides their chaste beauty of flower, some of the single species have another recommendation in the bright colored fruit which they show in the autumn, whereas the double flowered garden varieties generally produce no hips.

The Wild Roses are all, apparently, easy of cultivation in good garden soil; but a few may seem more at home and give more satisfaction under exceptional conditions. As a rule, all of them may be safely and exactly reproduced or propagated, according to their kind, by seed. If, however, it is desirable to perpetuate a peculiarity of color, a free-flowering habit, large blossoms, or any other characteristic of any individual plant, it should be propagated by cuttings or layers and not by seed. Some species form new roots very readily,

while others demand a little trouble and care in the production of new plants by division.

Grafting or budding of Wild Roses should be avoided as being of little utility and likely to perplex the amateur.

There has been much confusion and diversity of opinion among different botanists regarding the limitations and the number of natural species of the Roses of the world, some writers reducing the number of species to a score or two, while others have divided them into several hundred specifically distinct kinds. So many of these Wild Roses resemble one another so closely that there seems to be strong grounds for keeping only a limited number of specific names, many intermediate forms being referable to some typical characteristic species.

Some of the largest-blossomed and most beautiful of these single-flowered Roses are not hardy in such a rigorous climate as that of New England, but in our southern states they are or may be perfectly hardy and at home.

Among recent studies of Wild Roses by rhodologists certainly none are more thorough than those by Professor F. Crépin, of Brussels, who has devoted many years to a careful study of this genus. In his classification he divides all the species into a number of groups or sections, chiefly according to the characters and affinities of their flowers and fruit. As already stated, it is not always easy to determine the species of these plants. A student of the American Wild Roses, Dr. G. N. Best, very truly says: "Few plants are more strikingly modified by differences in environment than Roses. Even the younger growths appear quite different from the older, so much so indeed as to cause them to be taken for different species. A knowledge, therefore, of the value of characters is desirable. Quite contrary to what was once thought, the varying degrees of pubescence, glaucousness, glandulosity, and, to some extent, of prickles, possess little diagnostic value, and are to be considered most frequently as accidents of growth depending on peculiarities of soil and location for their development. Not that they are wholly devoid of value, but are so only when taken in connection with characters of the first order. . . . In rank bushes the spines may be stout and curved, in depauperate and slender, straight, and yet belong to the same species. They are frequently absent from bushes to which they normally belong, and this from no known cause." Such variations are liable to become more marked under a long term of garden cultivation, especially in regard to the size and vigor of all the parts of the plants. Where a large number of species are grown together it would seem that foreign pollen must sometimes have an influence on some of the seedlings of an allied species and natural hybrids be the result. In botanic gardens, where pure seed of any good species is desired, it would be well to protect the blossoms from visitations by insects, some of which are industrious collectors of the pollen.

One of the largest groups of wild Roses is that to which the old-fashioned Cinnamon Rose belongs. The single-flowered type of the Cinnamon Rose (*Rosa cinnamomea*) is a native of Europe and northern Asia. It is perfectly hardy where the thermometer registers thirty degrees below zero. The blossoms are of good size, fragrant, and in color like the double-flowered form which has been grown in gardens for centuries. This form has been neglected since the advent of so many finer double garden Roses. In some places it has escaped from cultivation and is found away from any building, covering considerable patches of ground by gradual spreading from underground shoots. *Rosa cinnamomea* is an early flowering species; but one of the earliest, if not the very earliest, of wild Roses to bloom here is *Rosa acicularis*, a species common in northern Europe and Asia and also indigenous in America. This may be made to include the *Rosa Engelmanni* figured on p. 377 of the second volume of GARDEN AND FOREST, or the *R. acicularis*, var. *Bourgeauiana*, as it was first named by Crépin. Under cultivation *Rosa acicularis* is an erect, vigorous bush from six to eight feet high, with stems and branches usually quite thickly covered with rather slender prickles. In this region the first of the large rosy pink flowers often expand as early as the 15th or 20th of May, and the fruit which follows ripens and becomes bright red in the latter part of August. It is a very hardy plant and blooms freely. It does not appear to have given origin to any double garden forms or to have been used much in artificial cross-fertilizing.

Rosa alpina, from Europe, has much the same habit and stature as the last species, and its flowers are hardly distinguishable and seem almost equally early. It is, however, comparatively unarmed and bears very few prickles. A number of double varieties have been derived from this species, and it is said to have been one of the parents of the old climbing, double-flowering kinds known as the Boursault Roses.

Rosa Beggeriana is an Asiatic species, which, although hardy, has not yet shown great vigor or long life here. It attains a height of five or six feet, and is erect, with slender branches which seem insufficiently covered by the foliage. It has slender spines, and the flowering branches are quite smooth and without prickles. The delicate pearly white blossoms are not large, averaging about an inch and a half across, and they are pleasantly fragrant. The fruit is small, round, and dark red in color. The regular blooming of the plant begins about the second week of June, but a few flowers continue to appear throughout the summer, imitating the habit of *Rosa rugosa*. Although the few stray flowers do not make much of a show, the habit may be further developed by selection, and the species is one which may yield some interesting hybrids. Professor Crépin states that there is a double variety of this in cultivation in the gardens of Turkistan.

Arnold Arboretum. *J. G. Jack.*

Pomological Candidates for Promotion.

IF, in the near future, it should seem good to the members of the American Pomological Society to revise its fruit list, with the purpose of amending and enlarging that portion of it allotted to the "best" apples, it would be well that the apple culturists of the continent should begin now to consider the subject, and make known their opinions. It seems to me that the state and provincial lists ought really to be made the basis of the continental list. In this way would be removed the anomaly of a list like the present, which contains so few varieties other than those of the north-eastern states. Surely the south, the west and the Pacific coast ought to be heard from; and even in the north and east there may be apples better entitled to the highest place than some of the present list.

It will be urged that time is required before any variety should be promoted to the highest place. Certainly, time enough should be allowed to permit a majority of the members of the Society to have some adequate knowledge in regard to fruits put forward as candidates for this award. But this need not be very long, when it is so easy in a few years to acquire the necessary acquaintance with such fruits. It must be determined, also, whether high dessert quality alone, without reference to thrift, productiveness and commercial value, is to be sufficient. Some of our finest apples are strictly garden sorts, requiring high culture and special treatment to fully develop their merits. But in these times such a need does not exclude a fruit from commerce. The great improvement which has taken place in our market gardens can be and is being extended to our orchards; and choice varieties, well grown and properly handled, can be made commercially profitable in the hands of competent growers, provided that they join to excellent flavor the other market qualities in a reasonable degree. If, however, a variety is absolutely unprofitable, and cannot be grown except as apricots are grown on our Atlantic slopes, it certainly is open to doubt its admissibility to the list of best apples on the mere quality of the fruit.

It ought to be in order, also, to inquire why sweet apples are excluded from the highest place. We have not excluded other fruits for this cause. On the contrary, sweetness is an acknowledged merit in our grapes, plums, oranges, peaches, strawberries and many other fruits. Mere sweetness, unaccompanied with other definite and acceptable flavor, may not be thought to entitle an apple to the highest place. But a considerable number of our sweet apples possess marked excellence of flavor other than saccharinity, if I may be allowed to use the term.

Further, it may be questioned whether it should be required that an apple be found "best" in every part of a country so large as this. If growers over a considerable section, or even of a single state, are unanimous in claiming this position for any of their choice fruits it should be allowed. Practically, this was the course taken in making up the present list, which was mainly done when the attendance was chiefly from eastern states.

I have been at the pains of drawing off and classifying carefully the apples rated by Downing as "very good," "very good to best" and "best" in his "Fruits and Fruit Trees of America." A considerable proportion of the apples described are given no rating; and those in the second appendix, though the quality is frequently spoken of, are not rated by this otherwise general system. A few varieties termed "excellent" I have included under the head of "very good," though it might be inferred that they are entitled to a higher rating. I here

append the names of the apples in the two higher lists, "very good to best" and "best," out of which (but not exclusively) I think a considerable number might be taken which are every way equal to some in the Society's list of "best." There are apples in the "very good" (and even in the "good") list which I believe worthy of the highest rank as dessert apples; but I recognize the fact that it is well to be chary in this matter rather than to err in the other direction. I give also the season (Summer, Fall, Early Winter, Late Winter, etc.) and the state where known. The following list comprises Downing's "best": American Golden Russet, W.; American Summer Pearmain, S.; Early Joe, S., New York; Esopus Spitzenburgh, W., New York; Garden Royal, E. F., Massachusetts; Green Newtown Pippin, L. W., New York; Jonathan, W., New York; Melon, W., New York; Mother, E. W., Massachusetts; Newtown Spitzenburgh, W., New York; Yellow Newtown Pippin, W. There are eleven in number, and except two, of which the origin is uncertain, they are all from two states. It is observable that Downing rarely expresses a definite opinion of the quality of fruits with which he is not somewhat familiar.

Downing's "very good to best" follows: Buckingham, E. W.; Canada Reinette, W., Quebec; Cogswell, W., Connecticut; Dyer, F.; Early Harvest, S.; Ellsworth, W., New York; Fall Pippin, L. F.; Fall Wine, F.; Fameuse, L. F., Quebec; Geneva Pippin, L. W., New York; Golay, L. W., Indiana; Grimes' Golden, W., Virginia; Haskell Sweet, F., Massachusetts; Higby Sweet, W., Ohio; Hubbardston Nonesuch, W., Massachusetts; Hunt Russet, L. W., Massachusetts; King of Tompkins, W., New Jersey; Lady's Sweet, L. W.; Long Island Pippin, W.; Mangum, F.; Monmouth Pippin, W., New Jersey; Peck's Pleasant, W., Rhode Island; Pomme Grise D'Or, W., Ontario; Primate, F.; Red Canada, L. W.; Rochester Pippin, W., New York; Summer Rose, S.; Swaar, W., New York; Wagener, W., New York; Westfield Seek-no-Further, W., Connecticut; White Pippin, W.

This list, it will be noted, contains three sweet apples; of one of them, the Lady's Sweet, he says: "We consider this one of the finest winter sweet apples for the dessert yet known or cultivated in this country. Its handsome appearance, delightful perfume, sprightly flavor, and the long time it remains in perfection, render it universally admired wherever it is known, and no garden should be without it." Of the Haskell, or "Sassafras," Sweet, he says, "tender, juicy, very sweet, rich, aromatic."

It cannot be doubted that there now exist many excellent apples of local fame which are not yet on record in our books of pomology. In a number of states there has been no systematic effort made to search out and place upon record the merits of their native apples; while in others where, in time past, lists have been made, varieties old and new in large numbers remain which have never fallen under the notice of pomologists, yet which may possess very valuable qualities. Is it not time that stronger efforts should be made to make our lists and estimates more complete and more exact?

Newport, Vt. *T. H. Hoskins.*

Fig. 1.—The White Oak (*Quercus alba*) in Winter.—See page 2.

The Pompone Lily.

OF the long list of Lilies in cultivation there are but few that are really hardy and reliable for out-door cultivation here in the eastern states, and of those that are satisfactory the greater portion are late-fall blooming kinds. It is also true that the early summer flowering Lilies are fewer still in number and may be easily counted. *L. pomponium* is one of the most reliable of Lilies; it is perfectly hardy in a well-drained, porous soil; the flowering period is June; the color of the flowers is similar to that of *L. tenuifolium*, the Siberian Lily—that is, bright scarlet, with just a tinge of orange—but, while *L. tenuifolium* rarely has more than one flower to the stem and is a most difficult bulb to keep, *L. pomponium* grows three feet high and often has from twenty to thirty flowers to a stem, and these are very fragrant. *L. pomponium* is a native of northern Italy and southern France, but, as before stated, is perfectly hardy. This Lily is often catalogued as *L. pomponium verum* to distinguish it from *L. pomponium aureum* of Dutch growers, which is very similar to it, but has yellow flowers. These flowers are also fragrant, and the plant has much larger bulbs, which are generally difficult to keep. This Lily is known to botanists as *L. Pyrenaicum*, a native of the Pyrenees, and is quite a different plant from the one under notice. It should, perhaps, be added that, after flowering, *L. pomponium* dies down about the end of July, to reappear early the next spring.

While on the subject of early-flowering Lilies, one cannot

refrain from saying a word in favor of *L. Hansoni*, a beautiful Japan species, named after an enthusiastic American cultivator of Lilies with whom this species first flowered. Descriptions of the flower of this Lily differ as to color; we, however, have always found it to be of a bright yellow, with dull purple spots. Its petals are remarkably thick in texture, which makes the flowers very lasting. This Lily also is perfectly hardy and of easy cultivation, and when grown well often attains a height of four to five feet, the leaves being disposed in dense whorls the whole length of the stem. This also is a distinct Lily, flowering in June, lasting long in bloom, and a plant with which we have never had any difficulty in cultivating. On the contrary, the bulbs increase rapidly when established.

South Lancaster, Mass. *E. O. Orpet.*

Dracæna Lindeni.

THIS is one of the most useful foliage plants that has been introduced during recent years. It lasts a considerable time in rooms without injury, and will bear the temperature and conditions of the conservatory from April until October, or longer if the temperature of that structure does not fall below fifty degrees. Although it will bear for a long time shady positions in rooms and in the conservatory, it does much better and lasts longer where a fairly light position can be accorded it. Highly colored specimens are handsome, but poorly colored ones are ordinary in appearance, and in this condition the plant has not much to recommend it. Success in having the plants a good color or the reverse depends solely upon the treatment they receive. Many have been unsuccessful in this respect through growing the plant in too warm a temperature. In a close stove the plant either becomes green or a sickly yellow, and is destitute of those beautiful markings which render it so conspicuous. Plants that are in this condition will, if removed to a lower temperature, soon develop colored leaves. An intermediate temperature appears to suit it best, although it does not grow so rapidly as under stove treatment. This does not matter materially as long as well colored examples can be produced, for if once they are developed they last a considerable time, and in light sunny positions in rooms we have known them to grow and improve. Plants that were taken into the dwelling-house in June are still there, and will last for some months longer in a presentable condition, when they will be cut up for stock.

This Dracæna does not require to be fully exposed to the sun, but it is by no means particular as to the amount of shade. The temperature appears to be the main factor of importance, whether the foliage colors or not. Even if heavily shaded in a moderately low temperature it colors well. We have this season discovered that it is at home even in a late vinery where the foliage was moderately thin and the air admitted liberally. To develop fine specimens they should never have insufficient root room from the time heads or cuttings are rooted. Pot them from time to time, until they are placed into ten-inch pots, if large, well developed plants are needed. This size is none too large, although the plant can effectively be used for decoration in any size down to two-inch pots. We have found it succeed admirably when potted firmly in a compost of fibry loam, sand and one-seventh of decayed manure.

It has been said that this Dracæna cannot be propagated rapidly enough for general purposes of decoration, and this is true if one system, and a general one, only is practiced. After taking off the head, which sometimes flowers after the plants have been root-bound and checked to wait for side shoots, which are produced one by one at intervals of time, is too slow. A quicker way is to cut up the stem into lengths of about three inches and insert them singly in small pots with sand at the base and plunge them in bottom heat. These soon break into growth, and, when large enough, the young should be taken off and re-rooted. By this means numbers are produced in little more time than one or two would be secured from the stem when allowed to break from the top in a natural manner. Plants of this nature when they bear conservatory treatment during the summer are invaluable in assisting to change the character of that structure.—*Journal of Horticulture.*

Fig. 2.—The White Oak (*Quercus alba*) in Summer.—See page 2.

The Hardy Hydrangea as a Decorative Plant.

WHEN walking through village streets one is often tempted to wish that nurserymen had not been so successful in introducing certain plants. A plant may be beautiful or satisfactory in itself, or when properly placed, and yet produce an unpleasing effect on account of its surroundings. A case in point is *Hydrangea paniculata grandiflora*, a valuable and showy shrub, which is pleasing enough when appropriately placed. This shrub is so readily propagated that it has proved a very profitable plant for the grower, and the result is that it has been the most largely distributed shrub of recent years. In certain streets one will find on the average

about every other lawn, large or small, decorated with one or more of these vigorous bushes, and the effect of the great masses of lumpy heads of white flowers in late summer so frequently repeated, is, to say the least, not very pleasing. These plants make rather rapid growth, and one sees many large masses even in small gardens, where they are often the pride of the owner; but, nevertheless, they do not favorably impress some casual passers-by.

My neighbor, who cultivates a small garden, treated this plant to better purpose last summer, and made a most effective group with it in combination with so-called "foliage plants." He struck, during the early spring, shoots about a foot long, of the Hydrangea, which were planted out at intervals near the grass-border and backed by dwarf Cannas and annual Euphorbias. Some low growing Snapdragons or similar flowering plants occupied the spaces toward the front and gave flashes of color during the season. In late summer the drooping heads of the Hydrangea flowered low, and were relieved by the background and surrounding masses of foliage. The whole effect, with glints of color from Cannas and other flowers, was cheerful, but quiet withal and in excellent taste for a moderate sized lawn. Frequent propagation from cuttings would, of course, require more care than many small growers are willing to take, but it would seem that these small cuttings would often be useful in many positions where the large standards were not satisfactory.

The Annual Euphorbia, *E. heterophylla*, to which allusion has been made, is a half hardy annual from Mexico, and it is also said to occur in south Florida. The plant is readily grown from seeds, is about three feet tall, branching, and with deep green, fiddle-shaped leaves. In late summer the bases of the leaves become a bright scarlet color, but only over a small section in the specimens I have observed. Judging from these it is far from being the brilliant and effective plant that was claimed when it was introduced as a novelty in 1889.

Elizabeth, N. J. *G.*

Clematis paniculata.—About the same time that Mr. Orpet had achieved success in grafting this valuable plant, I succeeded in raising over 200 of them from seed, and these have been distributed through the United States. I have always found it to ripen seed freely, but the seed is slow to germinate. It is better to sow it in the autumn, since nearly a year is saved by so doing. Spring sown seeds do not come up in any quantity until the spring following. When once started the plants grow rapidly and bloom at two years old. This Clematis comes perfectly true from seed, indeed this could hardly be otherwise, as no native allied species bloom at the same season. Seedlings, however, vary a little, and among ours is one superior variety. While time is saved by grafting, I yet think that when a species can be perpetuated by seed it is the best way. This is a well known fact with regard to plants from foreign countries having a milder climate, since much is gained in the way of acclimatization. This climber grows rapidly to a height of fifteen to twenty feet; but as the stems are woody and persistent, the lower part of the plant is apt to become bare. I would, therefore, advise pruning some part of it back yearly in order to keep it well furnished.

Wellesley, Mass. *T. D. Hatfield.*

Peaches for Forcing.—One-year-old plants should be obtained now and placed singly in fourteen-inch pots, or in boxes, two or more in each box, protected in some outhouse for two months and then taken into a greenhouse where the temperature is kept not warmer than fifty degrees at night. They will need syringing twice a day, and the top shoots, as soon as they are three inches long, should be pinched back to three leaves. This will give the lower shoots a slight advantage and balance the growth generally. Of course it is understood that the plants have been pruned into shape before planting—that is, the side shoots are to be cut back and the tops reduced one-third. After the growth is completed in the greenhouse they must be removed out-of-doors and water given them in sufficient quantity to keep them from shriveling. Such plants can be brought into the forcing-houses about the first week of November. Peaches require good loam, bone and potash to grow in. If boxes are used they should not be less than a foot deep and a foot wide, and the plants should be set a foot apart—that is, two plants in a box two feet long, and so on. The boxes may be two, three or four feet in length, and I prefer them to pots.

Pearl River, N. Y. *John Thorpe.*

The Best Peaches.—Among the hardier sorts of Peaches, Hill's Chili is of good quality. Morris White and all of this white class are best for canning, and are hardy. Early Rivers endures cold that will destroy many other varieties, while its offspring, Horton's Rivers, is a perfect freestone, although it has its parent's hardiness and excellent quality, with rather firmer flesh. Hynes' Surprise, ripening at the close of the Early Rivers season, is a perfect freestone, and hardy, too, while St. John follows as the earliest yellow sort. Some of these kinds have never failed of a crop even in the most adverse season. Garfield is a new yellow-fleshed Peach of excellent quality and size which promises to become a standard sort.

Geneva, N. Y. *W.*

The Forest.

Forest-policy Abroad.—I.

THE paper which follows was prepared for the meeting of the American Forestry Association, at Washington, last week, by Mr. Gifford Pinchot, and read by him in an abridged form:

The history of the forest has developed itself along similar lines in all the countries of Europe. If we neglect the factors which tended to preserve the European woodlands—factors which have been largely absent in our own country—this history is not without analogy to that of the forests of America. It may be thus briefly summarized:

In early times the demand made upon the forest was small, and the areas cut over easily covered themselves with young growth. The forest renewed itself and maintained its productive power. But as the demand increased the areas cut over increased with it, and the actual re-growth no longer kept pace with the quantity of timber which the forest was called upon to yield. Thus arose the necessity for planting and for a systematic treatment. Again, as the value of forest-land grew higher the separation and demarcation of the rights held by the state, by communes and by private parties naturally took place, and led it in turn to regular systems of forest-protection and management.

All forest-management may be said to rest on two self-evident truths: (1) that trees require many years to reach merchantable size; and (2) that a forest-crop cannot be taken every year from the same land. From the last statement it follows that a definite, far-seeing plan is necessary for the rational management of any forest; from the first, that forest-property is safest under the supervision of some imperishable guardian, or, in other words, of the state.

It would be impossible in this paper even to touch upon the forest-policy of all the nations which might justly claim attention, and I shall refer chiefly to those concerning which I have been fortunate enough to gain some personal knowledge.

To begin with Germany, we find about two-thirds of the forests under more or less complete control of the state. It will not be necessary in dealing with forest-policy in the German empire to treat independently the different states of which it is composed, because one principle lies at the root of forest-policy in each of them, which may be fully illustrated by reference to any one. This principle, special to no country or form of government, holds that "The state is the guardian of all public interests." It is in its interpretation that, for the purposes of this paper, its chief interest lies. From this point of view "public interests" must be taken to mean all interests other than private ones. So understood, this maxim may be said to sum up the forest-policy of nearly all the nations of Europe, as well under republican as under governments of a distinctly paternal character. For its illustration I will describe in few words the forest-organization of the kingdom of Prussia.

Covering an area of some 20,000,000 acres, the forests of Prussia occupy twenty-three per cent. of the total surface of the country. Their ownership—a point of capital importance in relation to our subject—is divided as follows: To the state belong nearly 6,000,000 acres, or twenty-nine per cent.; to towns, village communities and other public bodies, sixteen per cent., and to private owners rather more than half the total area, or fifty-five per cent.

The relation of the state to the forests which it owns is simple and rational. Holding it as a duty to preserve them for the present share which they take in the economy of the nation, the state has recognized also the obligation to hand down its forest-wealth unimpaired to future generations. It has recognized and respected equally the place which the forest holds in relation to agriculture and in the economy of nature, and hence feels itself doubly bound to protect its woodlands. It has, therefore, steadily refused to deliver them to more or less speedy destruction by allowing them to pass into the hands of shorter lived and less provident owners. Even in the times of greatest financial difficulty, when Prussia was

overrun and nearly annihilated by the French, the idea of selling the state forests was never seriously entertained.

But the Government of Prussia has not stopped here. Protection, standing alone, is irrational and incomplete. The cases where a forest reaches its highest usefulness by simply existing, are rare. The immense capital which the state woodlands represent is not permitted to lie idle, and the forest as a timber producer has taken its place among the permanent features of the land. The Government has done the only wise thing by managing its own forests through its own forest-officers.

The organization of the Forest Service is briefly as follows: At its head stands the Department, or, more correctly, the Ministry of Agriculture, which exercises general supervision over forest-affairs through the medium of the Oberlandforstmeister, Chief of the Forest Service. Next in authority is the Bezirksregierung, a council in charge of one of the thirty-five minor divisions of the Prussian state, which has full control over forest-business within its sphere of action. The members of the controlling staff, the Oberforstemeister and Forstmeister, are also members of this council. Their duties lie in the inspection of the officers of the executive staff, of whom there are 681 in Prussia. These officers, styled "Oberförster," are charged with the actual management of the public forest-lands, and it is on them that the security of public interests in the forest chiefly rests. Upon their selection and education the utmost care and forethought are expended.

Space does not permit me to enter into a full description of a system which has produced, perhaps, the most efficient forest-staff of the present day, and, indeed, the subject has been more than once treated in American publications. Briefly stated, their course of training begins after graduation from a gymnasium, with a year of practical work under some experienced Oberförster. Great stress is rightly laid on this year of preparatory work, chiefly because of the vastly greater force and reality which it gives the subsequent theoretical teaching. As one who has suffered from the lack of it, I may, perhaps, be permitted to bear my testimony to the value of the custom, which is, unfortunately, less widely extended than its merits deserve, but which I hope to see one day established in the forest-schools of our land. The young Prussian forester, who has had the good fortune to pass through this preliminary year, next spends two years at a forest-school of recognized merit, such as Munich, Münden or Giessen, and then one year at a university. Then comes the first state examination, which demands, besides a goodly share of theoretical knowledge, large proofs of efficiency in practical detail. It is followed by at least two years of travel and work, during which the candidate, now promoted to the title of Referenda, must take part during five months in the practical administration of a forest-range, and spend four months in the preparation of working plans, besides giving half a year to the active duties of an ordinary forest-guard. At the end of this rather long period of preparation comes the much dreaded final examination, after which the Referenda becomes Forest-Assessor, and is at length eligible for serious paid employment. The actual career of the forester can hardly be said to begin, however, until the appointment as Oberförster, for which the Assessor has no sort of guarantee, and which may delay its coming for from six to twenty years. That once obtained, the chance of promotion lies open, and includes every grade up to the highest. Still, it must be said that as a rule the Prussian Oberförster is wholly satisfied with his position, and very often unwilling to exchange it for one of greater honor and profit. The stimulus which ambition fails to give is supplied by the admirable esprit de corps which pervades the whole body of forest-officers, and forms here, as elsewhere, the best security for the efficiency and healthy tone of the service.

Immediately subordinate to the members of the Executive Staff are the various grades of forest-guards, upon whom the protection of the forest directly and exclusively rests. "The forester" (I quote from the Service Instructions) "must protect the beat entrusted to him against unlawful utilization, theft and injury, and see to it that the forest and game laws are observed. He is charged with the execution of the felling, planting and other forest-work, under the orders of the Oberförster, and he alone delivers all forest-produce to the persons qualified to receive it on receipt of written instructions."

The training of the Protective Staff is provided for with a care which, in any other land, might be thought more suitable for officers of a higher grade, and a period of preparation only less long than that for Oberförster stands before the beginner.

Such is in outline the organization of the Prussian Forest-service. The principles upon which it rests are thus stated by Donne, now Oberlandforstmeister, in a work which carries all the weight of an official document without being actually such. He says: "The fundamental rules for the management of state forests are these: First, to keep rigidly within the bounds of conservative treatment, and, secondly, to attain, consistently with such treatment, the greatest output of most useful products in the shortest time." And again, "The state believes itself bound, in the administration of its forests, to keep in view the common good of the people, and that as well with respect to the lasting satisfaction of the demand for timber and other forest-produce as to the numerous other purposes which the forest serves. It holds fast the duty to treat the Government woodlands as a trust held for the nation as a whole, to the end that it may enjoy for the present the highest satisfaction of its needs for forest-produce and the protection which the forest gives, and for all future time at least an equal share of equal blessings."

Correspondence.

The Holiday Flower Trade in Philadelphia.

To the Editor of GARDEN AND FOREST:

Sir.—The holiday trade of the florists seems to have been satisfactory this season, and as usual it marks a step forward both in quality and variety of the plants and flowers disposed of.

Flowers as holiday gifts are always acceptable, though it must be admitted that American Beauty Roses at $18 a dozen are in the nature of luxuries; but there is so great a variety of other flowers from which to choose that a very pretty box of assorted flowers can always be had for a moderate sum, and these special prices only rule on special occasions.

Probably owing to the bright weather which has prevailed during December cut flowers have been more than usually plentiful, Roses, of course, heading the list since the Chrysanthemum season has waned, and at the present time (December 30th) good flowers can be had of American Beauty, The Bride, Madame de Watteville, La France, Duchess of Albany, Madame Hoste, Catherine Mermet, Papa Gontier, Perle des Jardins, and among the Hybrid Perpetuals, Madame Gabriel Luizet, Mrs. John Laing and Ulrich Brunner, these being considered among the regular stock sorts for forcing. Speaking of Chrysanthemums reminds me that, though the season for these flowers is near its end, yet there are some still in the market, though of rather indifferent quality.

Carnations are in good supply, though first-class flowers with long stems command good figures, and these, like the Roses, may be had in considerable variety. The march of improvement is continued among the Carnations, too, and Philadelphia will show some fine seedlings within a season or two.

Rather out of the common was a wedding decoration during holiday week in which Pansies were the predominating flowers, the bridal flowers being white Pansies, while the maids of honor carried fancy baskets filled with colored Pansies, and the same flower was used as far as possible throughout the house decoration. Some effort was required to secure Pansies enough for such a purpose so early in the season, but the enterprising firm to whom the order was entrusted managed to execute it satisfactorily.

Lilies-of-the-Valley, Roman Hyacinths, Paper White Narcissus and single Daffodils are plentiful, as are also Violets. The latter may always be considered among the favorite flowers, so to speak, and in Philadelphia up to some two or three years past single Violets have been most in demand; but the taste for double ones is rapidly growing, and they will probably supersede the single ones in a few years.

Some sprays of White Lilac are to be had, but these are not forced to any great extent about here, but mostly come from New York.

Smilax continues in demand for greenery, but in fine arrangements it has been displaced to a considerable degree by the graceful and feathery festoons of *Asparagus plumosus*, for, while the latter is much lighter and more delicate in appearance than the Smilax, it is much more lasting.

A few Orchid flowers, mostly Cypripediums and Oncidiums, are to be seen; but these will never be the flower for the million, for few, if any, species are sufficiently prolific in flowers to make them remunerative if sold at a low figure.

Different fashions in the way of sending flowers seem to prevail in different localities. Some florists report a considerable increase in the call for baskets of flowers, while others find boxes of loose flowers in greatest request. Perhaps the

latter way of sending the gift is preferable, as it permits the happy recipients of the boxes the additional pleasure of arranging the flowers to their individual taste.

In plants many sales are reported, a specimen Palm placed in an ornamental pot making an admirable gift, and it is naturally a much more lasting one than cut flowers could be. *Areca lutescens, Livistonia Chinensis* and the Kentias are the favorites for this purpose, and are used in all sizes from four-inch pots up.

Another popular plant is *Dracæna fragrans*, as this also is an admirable house-plant when well grown. Quite a number of young plants of *Araucaria excelsa*, from one to three feet in height and grown in six or eight-inch pots, have been sold during the present season, and charming miniature trees they are too, their light green color giving a very pleasing effect in house decoration. Some early-flowered Azaleas, mostly white, are also among the available plants for Christmas and New Year gifts, and nicely shaped little standards in six or eight-inch pots seem doubly attractive so early in the season.

Holmesburg, Pa. *W. H. Taplin.*

Winter in Los Angeles.

To the Editor of Garden and Forest:

Sir.—Lovers of fruit and flowers find much to enjoy in this favored locality. On my arrival here, November 1st, Muscat grapes were abundant. The season for these is now over, and the market is supplied with three or four varieties of excellent quality from localities further north. On the first of November a limited quantity of second-crop blackberries and raspberries were seen, with a moderate supply of strawberries, which, though not equal to those grown in the east, are exceedingly enjoyable at this season of the year.

Among the fruits which are in season at Christmas-time here are strawberries, fresh figs, guavas, Japanese persimmons, oranges, lemons, limes, apples and pears. Oranges will not be at their best before February.

This morning I gathered fairly good flowers of *Nymphæa Zanzibarensis* and *N. azurea* from my garden and find in bloom Roses, Heliotropes, Geraniums, *Jasminum grandiflorum*, *Plumbago Capensis* and its white variety, *Tecoma Capensis*, *Dahlia arborea*, *Hibiscus Sinensis*, with Ageratums, Abutilons, Fuchsias and Violets. Poinsettias are a blaze of scarlet. In the garden of Mr. J. C. Harvey, an enthusiastic amateur, is a mass of these flowers eight feet high and ten feet through. In another garden I measured one head which was eighteen inches in diameter. In the garden of Judge Charles Silent is a plant of *Bignonia venusta*, covering a space ten by thirty feet, which is now a mass of glowing deep orange color. A somewhat rare plant in cultivation here is *Solanum Wendlandii*, a climber with lovely blue flowers two inches in diameter, in clusters six or eight inches across. A fence about fifty feet long covered from one end to the other with this vine is a charming sight. In the country the farmers are busy with the plow, and the fields are green with springing grass and new sown grain. The season for abundant wild flowers has not yet arrived, though in the foot-hills there still remain a few composites and a remnant of the scarlet *Zauschneria Californica*. In one of my rambles I found the dead stalks of *Delphinium nudicaule*, six feet high, which must have been a fine sight when in bloom.

Los Angeles, Cal. *E. D. Sturtevant.*

Cypripedium spectabile from Seed.

To the Editor of Garden and Forest:

Sir.—In your issue of November 26th there is an interesting note from Mr. Hill, of Fairview, West Virginia, about *Cypripedium spectabile*, in which he notes as one of the probable causes of its being rarely seen in cultivation that it rarely bears fertile seed. On this point perhaps my experience with the same plant would be interesting to those who enjoy the cultivation of our wild flowers.

A few years ago I had in my garden quite a number of these Cypripediums which I had gathered in the woods and transplanted, and which seemed to be well suited with their new home, for many of them grew to be larger plants and flowered better than those I have generally found growing wild. The growth was very strong, and many of the plants bore two blossoms on their spikes. Some of the blossoms of the stronger plants I fertilized, and they produced good seed-pods, which, when ripe and just bursting, I took off and scattered their seeds over the bed where the plants were growing. This planting was done late in the fall, of course, and for the winter a light covering of leaves gathered from the lawn was put over the whole bed. Most of the covering was taken off again in the spring, and the bed was left without disturbance beyond the keeping out of weeds, which were pulled up while yet small.

During the season following this first planting I was not positive that any seeds had started, and more blossoms were fertilized and more seeds sown as before, and in the second season after the first planting I was assured that I had seedlings growing, and had, moreover, two sizes of young plants, the larger being those of the first fall's sowing, which I had not been able to recognize the summer before, and the smaller ones plants that I now knew to be seedlings in their first year.

In this manner I was getting quite a number of seedlings, when, unfortunately, a change of residence obliged me to move my bed of these plants, and all were lost. The care that I had given to these seedlings was very slight, and probably many were lost in pulling out the weeds, and yet I had more than a dozen of them in the second year after sowing; and I am quite sure that with good care and in a good location this plant could be multiplied very rapidly from seed.

Chicago, Ill. *F. J. Le Moyne.*

Periodical Literature.

The most interesting article for American readers in the December issue of the *Kew Bulletin of Miscellaneous Information* is devoted to an account of the production of prunes in the south of France. The prune industry of California is developing enormously, and all that is required now to give California prunes a commanding position in the markets of the world is the adoption of the careful methods by which the French have gained their well deserved reputation in such matters. In this connection the following extracts from the *Bulletin* will be read, perhaps, with interest. They are from the pen of Mr. M. W. Colchester-Wemyss, who has studied with extreme care the prune industry of southern France with a view of ascertaining the possibility of starting a similar industry in England.

"About sixty miles above Bordeaux there falls into the Garonne a fine river which, taking its rise among the mountains of Cevennes, follows a course of some 150 miles, until its junction with the Garonne. This river is called the Lot, and the two rivers together confer the name on the Department known as Lot and Garonne. For several miles along the lower reaches of the Lot, and in the country immediately adjacent to the spot where it enters the Garonne, is produced the fruit known, when it has been specially prepared, as 'French plums.' For over 100 years the industry has been fixed in this locality, and still, with the sole exception of a valley in Servia, there is no other place where the same trees are cultivated. The tree is called 'Prunier d'ente.' 'Enter' is an old French word meaning to graft, and it is simply so called because this particular species was formerly the only plum in this district that ever was grafted. Now there are, practically, no plums other than the 'Prunes d'ente' grown in the neighborhood. Higher up the Garonne, round the old town of Agen and in other parts of southern France, another plum, the 'Prunier commun,' is largely grown, and its fruit treated similarly to that of the 'Prunier d'ente,' but the produce is very inferior and only suitable for stewing; but I believe that nowhere except in the Servian Valley is the true 'Prune d'ente' at present grown; and though many experiments have been made with other varieties, no others have yet been discovered that will yield the established qualities of the 'French plums.' It is rather capricious in its growth, for its area of cultivation does not extend very far from the river bank. It appears to delight in a rich alluvial soil of a rather sandy nature, but which contains a sufficiency of clay to make it very retentive of moisture. The centre of the 'French plum' district may be said to be at Clairac, a quaint little old-fashioned town built on a steep hill-side overlooking the Lot, almost more Spanish looking than French, its houses shaded from the fierce southern sun with wide outspreading eaves and flower-clad balconies.

"In this and the neighboring communes the metayer system is in full operation, and it appears to work well and harmoniously. The owner of the land engages the metayer and supplies all the implements and stock required for the holding; he also keeps the buildings in repair, including the house used by the metayer. The latter finds the whole of the labor except such extra labor as is needed during harvest-time. The

metayer, during the year, has entire control of the farm, and buys and sells, subject, if required, to the consent of the owner. He renders account of all produce from the holding consumed by himself and family, and at the end of the year the balance of profit is divided equally between the owner and the metayer. During the last few years the metayers have fared badly, for the Phylloxera has devastated the vineyards, and sad it is to see acres and acres of land excellent for the growth of grapes, but fit for little else, now deprived of those crops which formerly so well repaid the cost of cultivation. The holdings vary in extent from ten acres to sometimes fifty and sixty, and on every holding in the lowlands are to be seen rows of the 'Prunier d'ente.' The rows are separated from each other by long strips of cultivated land where the mild fawn-colored oxen lazily drag the most old-fashioned and primitive implements over the easily broken soil. The plums are long-shaped, the end to which the stalk is attached being very much the more pointed; color red, deepening into a rich violet as the plum ripens; the skin is extremely tough, without being very thick or hard; the flesh very firm, containing a large amount of saccharine; the specific gravity much less than that of several varieties of English plums with which I made comparison.

"The tree is a very slow grower, requiring ten years to bring it into full bearing, though I saw some trees six years old, very favorably situated, with a fair crop of fruit on them. The fruit also matures very slowly, and is not ripe till all other fruits in the district, apricots, green gages, peaches, have ripened. The plums are picked when just ripe, before the flesh has begun to soften, they are placed on 'claies' or trays, one layer of plums on each 'claie.' The 'claies' are made either of strips of wood or of wicker-work, and are either triangular or round. They are a little deeper than the thickness of a plum, so that when not in the ovens they can be safely placed upon each other. The 'claies' when filled are arranged upon the bottom of the 'fours' or inside the 'étuves,' and the operation commences. Each homestead has a building in which are placed the 'fours' and also the 'étuve,' if the metayer possesses one. The 'fours' are simply like very large ordinary bread-ovens. They are usually built in pairs, each one about ten feet long and four feet wide; they are heated by burning wood inside them; the ashes are cleared out and the 'claies' placed inside. The 'étuves' are closets of variable dimensions, with different appliances for holding the 'claies.' They have a small furnace with pipes underneath the floor for heating. There seems to be a preference for the 'fours,' though the 'étuves' are simpler and more convenient in every way.

"When the fresh fruit is put in the temperature should be about 100 degrees Fahrenheit. When the plums have been inside for about a couple of hours they assume a peculiar puffy appearance. The 'claies' are then withdrawn, the fruit turned by holding an empty 'claie' upside down close over a full one, and then turning them both over. After cooling, the 'claies' are again put into the 'four'; this time at a temperature of about 135 degrees; again withdrawn, turned, cooled, and put in at a temperatare of about 170 degrees; and this operation is continued until the plums have been dried. Some dry more rapidly than others, and they are picked out as they are ready. The more slowly the operation is performed, and the oftener the plums are put into the 'four,' the better will be the result.

"When they are ready the plums are sorted out into various grades, according to the number (30, 35, 40, 45, 50, 55 or more up to about 130) that it will take to make up the French pound, for curiously enough the old French measure is adhered to. They are put into sacks and carried to the markets. Here the merchants come and buy, paying prices varying according to the number of plums required to weigh a pound. Thirty to the pound would be worth about 120 francs the 100 pounds; forty to the pound about 100 francs, and so on down to the very lowest grades, which are not worth more than fifteen francs. The merchants convey the fruit to large, cool, airy warehouses, where it is thrown into bins, and women at long tables are employed sorting over again much more carefully than before. The various grades are then packed separately into casks and are sent to Bordeaux, where the finer qualities are packed carefully in bottles or boxes; the inferior are simply exported in bulk.

"About Agen and in the other districts another tree is cultivated, the 'Prunier commun.' This is a round, violet plum, grown on its own stock. The fruit is prepared in a similar manner to the 'Prune d'ente,' but is very inferior and is only fit for stewing. Enormous quantities are consumed by the peasants in the north and east of France."

Meetings of Societies.

The American Forestry Association.

THE ninth annual meeting of this Association was held at Washington on December 30th, 1890. A summer meeting having been held at Quebec September 2d-6th, the present meeting was primarily for business. At the morning session at the Department of Agriculture members were present from Colorado, Connecticut, Massachusetts, Minnesota, New York, Pennsylvania, South Carolina, Vermont and the District of Columbia. Owing to official duties Governor James A. Beaver, of Pennsylvania, President of the Association, was unable to attend, and Honorable Edwin Willets, the local Vice-President, occupied the chair. The report of the Executive Committee detailed the past year's growth of the Association, now numbering 225 active members, and referred to the increasing popular interest and belief in the necessity of forest-preservation and management all over the country. Attention was called to the work of the New Hampshire Forest-Commission, the movement for a state forest-park in the Adirondacks, the establishment of the Adirondack League Club, the Sequoia reservation and the appeal of the citizens and the Forest-Commission in California. The committee's efforts for national legislation have not yet met with the success that was hoped for last spring when the Special Committee of Congress was appointed to consider forestry-legislation. Legislation on the tariff, the elections, etc., having absorbed the attention of Congress and the public, this committee has not yet reported any of the bills before it; and it would look as if the struggle would have to be continued in the next Congress.

Dr. B. G. Northrop, Chairman of the Arbor Day Committee, presented a report on the increased observance of that day and the practical value of the planting done. Hon. Warren Higley, of New York, described the plans of the Adirondack League Club for practical forest-management on its 93,000 acres of woodlands.

At the afternoon session the committee on resolutions and nominations reported a proposed change in the constitution, adding six members at large to the Executive Committee. This was adopted. The following officers were then nominated and elected: President, William Alvord, of San Francisco; Vice-Presidents, Hon. H. G. Joly, Quebec; Dr. Charles Mohr, Alabama; Dr. M. Riordan, Arizona Territory; Abbot Kinney, California; G. H. Parsons, Colorado; Dr. B. G. Northrop, Connecticut; Hon. C. R. Pringle, Georgia; G. W. Minier, Illinois; C. L. Watrous, Iowa; Professor E. A. Popenoe, Kansas; Hon. A. M. Brown, Kentucky; J. D. W. French, Massachusetts; Professor W. J. Beal, Michigan; Hon. C. C. Andrews, Minnesota; Hon. J. Sterling Morton, Nebraska; J. B. Harrison, New Hampshire; W. A. Stiles, New Jersey; Morris K. Jesup, New York; Professor W. R. Lazenby, Ohio; Herbert Welsh, Pennsylvania; L. D. Davis, Rhode Island; Professor H. A. Green, South Carolina; Professor Charles A. Keffer, South Dakota; Hon. T. T. Wright, Tennessee; W. Goodrich Jones, Texas; Dr. Hiram A. Cutting, Vermont; H. C. Putnam, Wisconsin; Hon. Edwin Willets, District of Columbia; Hon. G. W. Allan, Ontario; Treasurer, Dr. H. M. Fisher, Philadelphia; Recording Secretary, Dr. N. H. Egleston, Washington; Corresponding Secretary, Edward A. Bowers, Washington; Executive Committee at large, B. E. Fernow, H. B. Ayres, Colonel E. T. Ensign, W. G. Pellew, Charles C. Binney, Hon. Warren Higley.

Statements were then made by various members as to forestry interests in their states, and the Association was invited to meet next summer at Denver, Colorado, which invitation was accepted.

The evening session was held conjointly with the American Economic Association at the National Museum. Professor E. J. James, of the latter body, was prevented by indisposition from reading his paper on the duty of Government in regard to forests. Very interesting papers were read by Gifford Pinchot, of New York, who is now studying forestry in Europe, on "Government Forestry Abroad;" by Edward A. Bowers, the new Corresponding Secretary and formerly an inspector of public lands, on "The Present Condition of the National Forests," and by B. E. Fernow, Chief of the Forestry Division, on "The Feasibility of American Forest-administration."

Resolutions were adopted urging the passage of a bill for the reservation and management of the national forests, the proper protection and enlargement of the Yosemite and Sequoia parks, and the state reservation of forest-lands in New Hampshire and New York. Congress was also petitioned to enact the Senate bill for changing the boundaries of the Yellowstone Park without the objectionable amendments added by the House committee.

Notes.

It is said that Orange growers have discovered a process by which an orange picked while green can be colored a rich yellow in forty-eight hours. No doubt consumers will continue to prefer ripe oranges to green ones artificially jaundiced.

Professor Marshall Ward's excellent address on "Elementary Botany in General Education," delivered not long ago at Leeds, England, and recently quoted in our columns, is reported more at length in the *Popular Science Monthly* for January.

The new park system which the City of Montevideo is about to inaugurate under the direction of the distinguished French artist, Édouard André, consists of two parks each of 175 acres, of four smaller parks varying from twenty-five to sixty acres each, of twelve public squares, and of a series of boulevards and broad avenues to connect the old and new parts of the city.

A dwarf form of the Calla Lily (*Richardia Æthiopica*), which was certificated some time ago by the Royal Horticultural Society, is highly commended in the *Gardeners' Chronicle*. It is a seedling, bears a perfect spathe, and is only nine inches or a foot in height. It flowers very freely, has beautiful foliage, and it is so small that it has altogether a different effect from that of the ordinary Calla.

The question as to what time of the year Pompeii was overwhelmed has puzzled antiquarians, but according to the *Gardeners' Chronicle* a late discovery enables us to answer it with some degree of certainty. The trunk of a tree bearing berries has been discovered among the ashes, the berries giving the clue to the nature of the tree, which was the true or Bay Laurel (*Laurus nobilis*). From the degree of maturity of the berries it is, moreover, surmised that the eruption took place in November.

Episcia maculata, a plant of the order Gesneraceæ and a native of British Guiana, first flowered at Kew last summer. In a paper on its floral biology recently published by Professor F. W. Oliver, he says that it is remarkable from the fact that the flowers do not open, as the front lobe of the corolla remains folded back, closing the mouth like a cork. Notwithstanding, its arrangements are for cross-fertilization through insect agency of some sort. The flower is believed to be unique in being thus at once closed and cross-fertilized.

When describing the Mulberry-trees in the province of Ssu-ch'uan, in western China, Mr. Alexander Hosie says: "Here I observed an ingenious device for obtaining young trees from the old. Round a promising branch of a tree a piece of Bamboo about a foot in length, which has previously been divided into two parts along its length, is tied, and the hollow between the branch and the interior of the Bamboo filled with mould. In a short time suckers leave the branch and descend into the mould, and when they are sufficiently developed the branch is cut off and planted, the suckers forming the roots of the young tree."

One of the last papers written by the late Professor Proctor and published in *Knowledge* says (we quote from a summary in the *Popular Science Monthly*): "In all the vegetable world color seems to be in all cases dependent on the requirements of propagation. Thus, where seeds are diffused by animals, as with the berries, we find the fruits brightly colored, to attract the attention of the animal distributors. It will be noticed that when seeds are distributed by the winds, bright colors are not found in the fruit, even though the plant be closely allied to species distributed by animals in which the bright colors are present."

The latest bulletin from the Cornell University Experiment Station gives some account of the Pear-leaf blister, which appears on the leaves in the form of dark reddish spots an eighth of an inch or more in diameter, and are produced by a gall-mite, which has long been known in Europe, but has attracted little attention as yet in this country. The insect is practically invisible to the naked eye, and as it lives within the tissue of the leaves ordinary insecticides cannot reach it. The only promising method of attacking these pests is to prune away and burn the young wood in winter, since it is their habit to quit the leaves as they dry in autumn and collect on the terminal buds, where they remain until spring.

Dr. Byron D. Halsted contemplates the publication of a "Century of Weeds," and hopes to follow it by a second collection showing the seeds of the same species and then to carry on the work until all the annoying and pestiferous plants of America are fully represented in herbaria. American botanists in all parts of the country have been asked to send in lists of the twenty worst weeds in their vicinities, and from their reports the "Century" will be composed. The price has not yet been fixed, but it is expected to be about $8, and Dr. Halsted will be grateful for all words of encouragement, believing that, while the result of his laborious task will be of special value to our agricultural colleges and experiment stations, it will also be of interest to systematic botanists in general.

The last annual report of the Trustees of the Astor Library, in this city, shows that during the year 1889 only 538 readers called for works dealing with agriculture and horticulture, as against 2,748 who called for works on architecture, and 6,762 who desired to study painting, sculpture or archæology. Of students who asked admission to the alcoves for the purpose of more serious research there were fifty-six concerned with architecture, 467 with painting, sculpture and archæology, and only three with agriculture and horticulture. Yet the Library authorities seem to recognize the importance of this department, for while there were fourteen works upon architecture added to the collection during the year and forty-five on the other arts, there were thirty-nine upon agriculture and horticulture. More than half the alcove readers were interested in patents, 5,082 having applied for this purpose, while, with a great gap between, American history came next with 788 students.

Writing of western Pennsylvania in the year 1795 the Marquis De Talleyrand says, in a passage from his "Diary" published in the *Century Magazine* for January: "I was struck with astonishment; less than 150 miles distance from the capital all trace of men's presence disappeared. Wild nature in all its pristine vigor confronted us; forests as old as the world itself; decayed plants and trees covered the very ground where they once grew in wildness; others shooting forth from under the débris of the former and like them destined to decay and rot; thick and intricate branches that often barred our progress; green and luxuriant grass decking the banks of rivers; some large natural meadows; some strange and delicate flowers quite new to me; and here and there the traces of former tornadoes that had carried everything before them. Enormous trees all mowed down in the same direction, extending for some considerable distance, bear witness to the wonderful character of those terrible phenomena." In another passage Talleyrand reports that he saw, "sixty miles from Boston, 6,000 feet of timber exchanged for a bullock."

The *Calcutta Englishman* recently said: "Among the exquisite arts for which the Indian people have long been famous, Sandal-wood carving is one that neither government nor native patronage can rescue from inevitable decay. Parsees have taken up the art in Bombay, and by employing their own methods and enterprise on it have found a market and established a trade, although their work bears no comparison with that of Mysore, the home of the art. The Sandal-wood carvers of Mysore turn out work which is indeed exquisite, and their skill is acquired by slow years of patient practice from boyhood. But the decay of this and other laborious Indian arts is inevitable. The native courts, which used to be the chief patrons of indigenous art, have now the products of all Europe competing for their favor, while, on the other hand, the European markets, which might be open to Indian wares, are impatient of India's tedious methods and stinted supplies. Meanwhile, even conservative India cannot resist the rush of the railway and the whirl of education. Her boys will not sit down for years in one shop without a thought except to perpetuate for generations to come the few and curious ideas of generations foregone. Sandal-wood looks pretty and smells sweet, but the School of Art, with its morning school and its Saturday holiday, is killing the ancient order of Mysore carvers."

Catalogues Received.

F. Bartheldes & Co., Lawrence, Kan.; Seeds.—A. Blanc, Philadelphia, Pa.; Electrotypes of Plants and Flowers.—J. L. Campbell, West Elizabeth, Allegheny Co., Pa.; The Eureka Incubator and Brooder.—P. H. Foster, Babylon, N. Y.; Nursery Stock.—Haage & Schmidt, Erfurt, Germany; Novelties in Flower and Vegetable Seeds.—Johnson & Stokes, Philadelphia, Pa.; Flower and Vegetable Seeds, Bulbs, Tools, etc.—Geo. J. Kellogg & Sons, Janesville, Wis.; Large and Small Fruits.—Harlan P. Kelsey, Linville, Mitchell Co., N. C.; Wild Flowering Trees, Shrubs and Vines of the Southern Alleghany Mountains.—Wm. Paul & Son, Waltham Cross, Herts, Eng.; Roses.—James Rankin, South Easton, Mass.; The Improved Monarch Incubator.—George H. Stahl, Quincy, Ill.; Improved Excelsior Incubator.

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The National Forest-question.

THE perusal of the last annual report of the Secretary of the Interior must make it apparent even to persons little familiar with the forest-conditions which prevail in the western half of this continent that the nation's great forest-inheritance is in serious danger, and that the resources now at the command of the department are entirely inadequate to protect it. How inadequate these are and how great has become the lawlessness engendered by the way offenses against forest-property have always been condoned in this country, appear in the fact reported by the Secretary that the Canadians have actually invaded the territory of the United States at the point where the Rainy River forms the northern boundary of Minnesota for the purpose of cutting and carrying away timber growing on our public domain. Roads have been built into the forest here and a fleet of steamboats equipped to tow the plundered logs to Canadian mills. This is not a more striking instance of the inability of the Government to cope with the dangers which menace our national forests than a dozen others which might be mentioned. Indeed, during the last twenty years the forests of the public domain have been systematically robbed in Minnesota, in Colorado, in California, in New Mexico, and in every state and territory where profit was to be made by manufacturing stolen lumber. This illicit industry has developed populous towns; it has floated ships and equipped mills; and it has ruined and demoralized entire communities who have learned to forget in the looseness of the American principle of forest-management that there was as great a moral offense in stealing a tree from the public domain as in stealing a neighbor's horse. The Government, and not the people, are to blame for the present attitude of the country toward the nation's forests; and the whole theory under which the western lands have been managed is wrong and demoralizing. It may have been perhaps good policy once to give farming-land to settlers at nominal prices, although now that the best land is taken up, the time for doing this has certainly passed; and it is clearly good business for the Government to sell its lands for what they are actually worth in the market.

The conveyance of agricultural land to the settler has always been guarded by law, or, at least, by a semblance of law, and although the system is open to many serious objections, it has had at least the advantage of filling up rapidly large territories. But in the case of the forest other problems have to be met. It was long the principle to allow settlers to cut without restriction such timber as they needed for domestic and agricultural purposes from rough, stony land unfit for farming. Mining companies were allowed to cut all the timber and fuel they needed from the public forests, and railroads were given the same privilege. When men are allowed to go out and cut the timber they need upon land which does not belong to them, they will not be particularly careful how much is cut or how the work is done, and the limit set by personal needs will not always be regarded. Lawlessness and utter disregard of forest-property must be the inevitable result of such a system. The authority given to settlers to supply themselves with timber in this way was taken away some years ago; but now the Commissioner of the General Land Office recommends the enactment of a law repealing statutes forbidding the entry of rugged, stony or other timber-lands unfit for cultivation except under the mining or town-site laws, and allowing settlers to use the timber on such lands which they may actually need to develop the country.

The enactment of such a law as the Commissioner recommends seems to us dangerous and a menace to the best interests of the country. The forests in all the western country, with the exception of those which clothe the shores of Puget Sound, may be divided into two classes; those of the high mountain ranges composed of large and often valuable trees, and those on the rugged and stony land of the lower mountain-slopes and foot-hills. It is from these last, if we understand the purpose of the Commissioner, that the people living in the valleys are to be allowed to cut without control or supervision what timber they require to carry on their farming operations. All these foot-hill forests are stunted and unproductive in comparison with the forests which grow high above them on the mountains; the trees are small and stand at considerable distances apart, and the wood they yield is brittle, crooked and full of knots. To a person accustomed to the forests of Maine or Michigan or Oregon these foot-hill forests must appear worthless and their destruction a matter of no importance. Actually, however, they are as valuable as the forests of any other part of the country. It is their proximity to arable land which makes them valuable, not the character of the timber they can supply. They contain the most available, practically the only, fuel-supply and fencing material for many valleys. When they are destroyed the cost of living on the farms in their neighborhood will be immensely increased, and in some valleys agriculture will not be possible without these forests to draw upon. They are unproductive because the climate in which they grow is not suitable to develop a heavy forest; and if they are cut down or burned they will reproduce themselves very slowly, or not at all. They require, therefore, more careful management than forests growing under more favorable conditions, and unless they are cut systematically, and guarded in every possible way, they will soon disappear not to spring up again.

It is proper that farmers in western valleys should get the advantage which comes from living in the neighborhood of a forest, but they should be compelled to purchase the fee of the forest-land from the Government if they are bound to destroy the forests, or the Government should itself hold such forest-property for the benefit of the whole community, and so manage it that the whole community will get the greatest possible returns from it. This is what Government forest-management means—the care of the forest for the good of all.

The American system, which allows settlers or corporations to go into the forests and help themselves and then

burn up what is left, saves a great deal of trouble ; and the settlers and the corporations like it and are prepared to fight for its continuation. It is, however, an expensive method in the long run, and it can have but one ending—the injury and finally the agricultural ruin of the region where it is practiced.

It appears that 310 cases of trespass on the public forests, involving a loss to the Government of more than three millions of dollars, were reported during the year, although only about a hundred thousand dollars were collected by the Government for losses sustained by the illegal cutting of timber. There are, however, still unsettled claims of this sort for nearly fifteen millions of dollars, from which, probably, a small percentage will in time be collected. But trespasses of this sort do comparatively small damage to the national forest. Their greatest enemies are fire and pasturage. As compared with the damage inflicted by these, the cutting down of a few thousand acres of timber more or less amounts to little. The pasturage of sheep on the Calfornia Sierras has already inflicted untold injury to the finest coniferous forests in the world ; and fires in the western forests seem to be increasing rather than diminishing every year. They are most frequent and most severe in the dry interior region of the continent, where forests are scanty from climatic causes, and where once destroyed they reappear slowly, or not at all. It is evident that any effort to preserve the forests from illegal pasturage will be resisted in the most violent manner by the people of California, and that the spread of forest-fires can only be checked by determined effort of the Government. Apparently it can be accomplished only by the free use of the army as a forest-police, as we have already insisted.

The attention devoted to the forest-question by the Commissioner of the General Land Office and by the Secretary of the Interior in their last annual report shows that the public begins at least to realize the importance of doing something to protect the national forests. This is in itself hopeful ; recommendations are not actions, however, and the outlook in Congress for immediate action in the direction of a national forest-system is not encouraging.

The Pines at Christmas-time.

TWO days before Christmas, while walking among the Pines in search of decorative evergreens, I found several Golden-rods in bloom. They were growing where a new road had been cut through a swamp. The road was narrow, and the thick growth of underbrush and trees on either side somewhat sheltered and protected them. It was the fine thick-leaved species *Solidago sempervirens*. The road had been made during the summer and autumn, consequently the plants had been cut back or trampled down, and as soon as left to themselves they began to throw up flower stems, and although the mercury had gone as low as twenty above zero, yet here they stood, defying the cold, in different stages of growth. Some just starting to send up flower-stalks, others fully developed and not looking much the worse for the freezing. The foliage was specially fine.

Among other Christmas treasures we gathered Holly, Mistletoe, Laurel, and the rich purple, fragrant leaves of the Wax Myrtle, and the large, thick, shining leaves of Magnolia, which have a spicy odor in winter more marked than in summer. And we added the Inkberry as well as the bright scarlet berries of the Black Alder or Winterberry, and long trailing sprays of Smilax covered with clusters of purplish fruit. Small branches of Cedar full of dull bluish berry-like little cones were gathered, and with them boughs of Pine, with its delicious invigorating fragrance. There is nothing more handsome for winter decoration than small branches of Pine, its matted bunches of leaves interspersed with the young cones.

Although we had almost a carriage-load of evergreen treasures, we were still loath to leave the woods on this delightful sunny day with the thermometer at fifty in the shade, and we began to study Pine-trees, of which we have three species—the Pitch Pine (*Pinus rigida*), the Jersey or Scrub Pine (*P. Virginiana*), and the Yellow Pine (*P. mitis*). The Pitch Pine is the prevailing species in the neighborhood of Vineland.

This species, Professor Sargent tells us in his "Catalogue of the Forest-trees of North America," "is found from Mount Desert, Maine, and northern Vermont, to the upper district of Georgia, not extending west of the Alleghany Mountain region," and adds that it grows from forty to eighty feet in height, with a trunk sometimes thirty inches in diameter, and that it grows in the driest and most barren sandy soil as well as in deep swamps. No other Pine looks as well as this in our gardens among our Cedars and Sassafras, Sweet-Gums and Tupelos. When healthy it grows rapidly, and the younger trees are clothed from base to summit with heavy foliage, and the older ones are rugged and picturesque.

But from all appearances, in our region at least, they will soon all be killed by insect enemies. No other Pine, as far as I can learn, is beset with so many foes as this. It is a pitiable sight to see large tracts of young trees standing with brown foliage, killed outright by various insects. The only way that I have saved the young trees in my garden has been by the most persevering vigilance. One of the most destructive things I have found was the larvæ of a small Tortrix-moth (*Retinia frustrana*), which mines into the terminal buds and young shoots. On some of the trees, when I first found the creatures, there was scarcely a terminal shoot that did not hold from one to five of these destructive larvæ. They are completely hidden while at work, and soon destroy the twigs by eating all except a thin shell which is so brittle that it will crumble to pieces when handled.

My trees were badly crippled by their work, but by the third summer after finding them, I so diminished their numbers that the trees are again growing and looking well. There is no way of killing these larvæ after they have become established in the twigs except by hand picking. But I have found that the moth will not deposit her eggs on the twigs after they are well dusted with Pyrethrum powder. I use a small bellows while the twigs are damp with dew, and apply the powder after each rain.

Another destructive creature is the larva of the White Pine Saw-fly (*Lophyrus abbotii*), which eats the foliage. These larvæ live in colonies and soon strip a twig entirely of its leaves, and move on to the next, destroying every leaf as they go. But I can manage these creatures much more easily than the Tortrix-larvæ. I slip a pan beneath the twig and soon jar them all into it. I have no idea how many broods there are in a season, as I find them all summer long. And even as late as the middle of November I was surprised to find a colony feeding on one of my Pines, after they must have been frozen and ought to have been dead !

Although this creature is called the White Pine Saw-fly, it likes our Pitch Pine very much better. I have small White Pines growing in the vicinity of the Pitch Pines, but as yet the former have never been disturbed by the Saw-fly larvæ, nor by the Tortrix-moth.*

But these two insects are not the ones that have killed our Pines in the wood. This has been done by the larvæ of beetles, an account of which I must leave for another article.

Vineland, N. J. *Mary Treat.*

Winter Flowers in Oregon.

ON Christmas-day I counted some half dozen plants, mostly common weeds, blooming here in one of my neighbor's gardens. They were mostly plants which had not perished in the annual drying up of such things here in the latter part of the summer, which is our dry season. Their lives had been preserved because they chanced to grow in an irrigated and cultivated enclosure.

They were: The May-weed (*Anthemis Cotula*), the Shepherd's Purse (*Capsella Bursa-pastoris*), the Heron's-bill Geranium (*Erodium cicutarium*), the Mouse-ear Chick-weed (*Cerastium viscosum*), a Lupine (*L. micrantha*, var. *bicolor*), the black Mustard (*Brassica nigra*), the common Knot-grass (*Polygonum aviculare*) and *Boisduvalia densiflora*.

The last is without any common name here so far as I know. It is a near relative of the Godetias, Clarkias, etc. The small flowers are borne in a long, close, densely-leaved spike or in short lateral spikelets, and they are rose-colored or purplish. It is found only in moist ground. A smaller species, *B. Torreyi*, which blooms in the summer at the same time with this, I find on dry ground only.

The pretty little white and bluish purple flowers of the Lupine mentioned are out in the spring before those of any other Lupine here, and may be seen long after other larger and later-blooming plants of this genus have dried up and died. The Heron's-bill Geranium is the common forage plant, the "Filaree" of California and Oregon. The Shepherd's Purse,

*Figures of both these insects may be found in Bulletin No. 7 of the "United States Entomological Commission" under the title of "Insects Injurious to Forest and Shade Trees," by A. S. Packard, Jr., M.D.

the Chick-weed and the Knot-grass are the well known plants growing nearly everywhere in cultivated grounds.

But the first and only true wild flower of the season that I have seen as yet was a blossom of our little wild Strawberry plant, which I found early in December (I have found a number of them since). This plant, being a perennial, never wholly dies, and here it always renews its growth at the beginning of the rainy season. Indeed, I have known the ripe fruit to be gathered in November from plants growing wild in the pastures. If the winter be a mild one it will flower sparingly all the winter season; but it does not usually come into active blooming until about the middle of March, and April is its most floriferous season. But by that time many other species of plants, some of which are not as yet out of the ground, will have strewn the ground—literally covered it in many places—for a month or more with the prettiest wild flowers.

If the weather continues mild, in January we shall have the little Buttercup (*Ranunculus occidentalis*, var.?) which is so abundant here in the spring. It loves the upland or moderately dry ground, and in March and April large tracts of such land will be yellow for a time with its bright flowers. Its blooming period will culminate about the middle of April, or perhaps a little earlier; but it will continue to bloom more or less until nearly midsummer. The pretty little *Dentaria tenella* will also make its welcome appearance in January. By February it will have become abundant.

Crocidium multicaule, a very interesting little plant, because of its blooming so abundantly and so early in the season, will also be sure to be found. It has a little yellow blossom at the top of the slender stem, which usually is only three to four or five inches high. These little plants are gregarious, if such a term may be applied to plants, and are nearly always found occupying little patches of ground by themselves, which they render yellow when in flower. The plant belongs to the Composite family; and so the little blossom is composed of several very small individual flowers collected into a capitulum or head, the whole surrounded by an involucre of scales, which to persons not botanists gives it the appearance of a single flower. These Crocidiums always occupy warm, dry, sunny places.

In moist places, those who are looking closely for wild flowers will at this time be pretty sure to find our dainty Nemophila (*N. parviflora?*) in bloom. This little plant is also very frequently found in the timber where the ground is moist and shady, for, as its name implies, it loves the woods.

In or near the timber, where the ground is moist and shaded throughout the year, may nearly always be found *Synthyris rotundifolia*, whose cordate, crenately margined leaves are an interesting feature of these woods the year round. Its flowers are a light violet color, in clusters near the ground. In all mild winters *S. rotundifolia* blooms abundantly in January and February; I have even found it in flower before this time of year. It continues to bloom, of course, until late in the summer.

Peucedanum utriculatum, a small umbilliferous plant with yellow flowers, is also among our earliest plants to bloom. These humble plants spring up soon after the rains begin; and they have been growing now for some weeks. A Luzula, or Wood-rush, will probably complete the list of herbaceous plants found in bloom here during the winter months.

Among the trees, the Alder (*Alnus rhombifolia*) will be in bloom early in February, or in January if the winter be mild. The Hazels will follow closely after and then the Manzanitas and some of the early Willows. Nuttallia and the Snowberry will by this time be leafing out; and in early March the Dodecatheons, the Erythroniums and other large and handsome flowers will open in abundance, and our true season of flowers will begin.

Wimer, Ore. *E. W. Hammond.*

Flowers and the Perfume Industry.

M. THOMAS GRIMM describes in the *Petit Journal* the method by which, in the districts of Cannes and Grasse, enormous quantities of perfumes are annually made from the flowers grown in those neighborhoods. He estimates that something like 62,000 acres are given up to the growth of flowers between the right bank of the Var and the chain of the Estérel. At one of the largest perfume factories of Grasse, M. Grimm found that the three principal operations in the making of perfumes were the preservation of the odor of the flowers by distillation, by enfleurage and by exhaustion. The last named process, which is applied chiefly to Roses, is perhaps the most important. It consists of submitting the petals of the flowers to the action of heat in broad deep pans heated by steam and filled with a mixture of lard and beef-fat. When the Rose has yielded up the whole of its essence, the contents of the vessel are placed in horse-hair sieves, and the so-called pomade which runs out under pressure is again placed in the receptacle with fresh Rose-petals. This operation is three or four times repeated, in order that the fat may be thoroughly saturated with perfume. The product is not sold in this condition as perfume, since it is far too strong smelling. It is treated as a kind of "stock," from which most of the perfume is afterward extracted by means of alcohol, and the residuum is used as a basis for pomade or toilet soaps, according to the degree of aroma that may remain.

The distillation of flowers is still conducted by aid of the time-honored machine called the "Florentine Receptacle." This apparatus collects not only the water distilled from the flowers, double, triple or quadruple, according to the number of distillations, but also the essential oil, which is the very quintessence of the perfume. Ten thousand pounds of fresh Rose-leaves will provide only one pound of this essence; but only half that quantity of Orange-flower leaves is required to make a pound of essence. There are some flowers which will not yield up their essence to what is called the hot method of manipulation. Among them are the Violet, Mignonette, Jessamine and Heliotrope, and these have to be treated by a very delicate process; the petals are brought into contact with wool saturated with Olive oil, and then the perfumed oil is very carefully expressed. Nearly every operation connected with the making of perfumes requires to be performed very rapidly, since the value of the product depends in great measure upon the perfect freshness of the materials. The flowers are picked by women shortly before dawn, are immediately cleansed, and piled up in great heaps in the workrooms, which themselves need to be very carefully chosen, since they must be spacious, well aired and shielded from direct sunlight. That which M. Grimm visited satisfied these conditions admirably, being the crypt of an ancient Capuchin monastery.

Such is the rapidity with which the work has to be done, that if all the flowers used in the making of perfumes came to perfection at the same time it would be impossible to accomplish it. Happily, that is not the case. The season begins with the Violets, on January 15th, and they are gathered until April 15th. In the Commune of Grasse alone from 290,000 to 300,000 pounds of Violets are manipulated during these two months. The Jonquils flower in February and March, and furnish 30,000 pounds to the perfume factories of Grasse. The crops of Orange-flowers and Roses are the most important of all; this harvest begins on April 20th and ends on May 31st. The neighborhood of Grasse produces annually 3,800,000 pounds of Orange-flowers and 2,000,000 pounds of roses. Mignonette, which is gathered from May 15th to the end of June, yields a crop of 50,000 pounds. The Jasmine, which yields 300,000 pounds, and the Tuberose, which gives 150,000 pounds, are gathered from July 20th to October 10th. Then comes the Cassia, with its concentrated, penetrating and almost violent perfume, which begins to flower in October and finishes at the moment when the Roses begin. No mention has been made of Lavender and Rosemary, because, although they are cultivated to perhaps a greater extent than any other flowers, they are chiefly treated throughout the south of France by nomadic distilleries which move about from canton to canton.

Notes on North American Trees.—XXII.

42. *Reynosia latifolia*, Griseb. This small Florida tree has been referred (Gray, *Bot. Gazette*, iv., 208) to the *Rhamnus lævigatus*, Vahl ("Symb.," iii., 41), the *Ceanothus lævigatus*, DC. ("Prodr.," ii., 30), and if the correctness of this reference could be satisfactorily established the proper name of the plant would be *Reynosia lævigata*. The identity of these two plants, although possible, is certainly doubtful. Vahl's description is short and unsatisfactory. The leaves of Rhamnidium are usually opposite, while those of his plant are described as alternate without any reference to their being emarginate at the apex, a pretty constant character in nearly all the species of Rhamnidium. Professor Trelease, who has examined Vahl's herbarium at Copenhagen (*Proc. St. Louis Acad.*, v., 364), was unable to find the type of *Rhamnus lævigatus*; so that as long as this uncertainty remains it will be safe to retain Grisebach's name as he wrote it.

Reynosia is referred by Baillon ("Hist. Pl.," vi., 82) to Condalia. It differs, however, from the plants of that genus in the thinner and much less prominent disk of the flower, in the thinner wall of the stone of the fruit, and in its longer radicle and ruminate albumen; and in habit and in its unarmed branches. Baron Eggers, in his characters of the genus Reynosia ("Vidensk. Medd. fra nat. For. Kiobenh.," 1877, 3), describes the flower with five (0?) cucullate, unguiculate petals inserted on the margin of the disk between the lobes of the calyx. I have been able to examine the flowers of *R. latifolia* only; these show no trace of petals, nor do we find the margins of the cotyledons recurved and subcontorted as described by Eggers. The stigma is as often three as two-lobed.

43. *Condalia ferrea*, Griseb. This common West Indian and Florida tree has already been referred to no less than six distinct genera, in none of which it seems properly to belong. The last reference, that of Grisebach, to Condalia, made probably because, like Condalia, it has no petals, certainly cannot be sustained. The completely two-celled ovary, exalbuminous seed filled with the thick and fleshy cotyledons, remove it from that genus, which it does not resemble in its unarmed branches, and large opposite, persistent leaves. The distribution of this plant is quite different, too, from that of Condalia, which is not represented in the West India flora. The structure of the seed is that of Zizyphus, which is sometimes destitute of petals, but the pinnate venation of the leaves and the unarmed branches make it undesirable to unite it with that genus. Nothing remains, then, but to consider our plant the type of a new genus, or to refer it to the Brazilian genus Rhamnidium, enlarged by the addition of a section with apetalous flowers to receive it. This, on the whole, seems to be the best disposition to make of our plant, Reisseck's genus (Martius, *Fl. Braz.*, xi., 194) having been already extended by Grisebach (*Cat. Pl. Cub.*, 32) to include a group of West Indian shrubs very similar to our plant in habit and inflorescence and in the structure of the fruit, although, unlike it, provided with petals. The leaves of all the West Indian species are coriaceous and persistent without the prominent veins which characterize the Brazilian species, while the leaves of these last are apparently deciduous, at least in the case of two of the species. The walls of the stone of our plant are thick and crustaceous, but not more so than in one or two of the West Indian species now referred to this genus; and the branchlets are thickly beset with lenticels, a character common to all the species of the genus.

The oldest name of our plant is that of Vahl (*Symb.*, iii. 41, t. 58), who published an excellent figure of it; so that, if it is referred to Rhamnidium, it becomes *Rhamnidium ferreum*.

Rhamnidium was placed by Bentham & Hooker in the "Genera Plantarum" in the tribe *Rhamnæ*, in which the fruit is described as dry or drupaceous, with three (rarely two to four) indehiscent or two-valved cocci or stones. The fruit of Rhamnidium is, however, a true drupe, with a single one to two-celled stone, and seems rather to belong with the *Zizyphæ* and to follow naturally after Condalia.

C. S. Sargent.

New or Little Known Plants.

A Hybrid Calanthe.

IN the report of the Boston Chrysanthemum Show, on page 566 of the issue of Garden and Forest for November 19th, 1890, appears a reference to a new seedling Calanthe. The specimen in question was exhibited by Mr. Richard Gardner, gardener to Mr. Cornelius Vanderbilt, of Newport, Rhode Island, and it was awarded the silver medal of the Massachusetts Horticultural Society. The seedling, as stated in the report, is the result of fertilizing *C. vestita rubro-oculata* with the pollen of *C. Veitchii*. It was raised in the garden of Mr. Pierre Lorillard, at Jobstown, New Jersey, by Mr. Gardner in 1882. The pseudo-bulbs, in the development of which it is extremely prolific, are larger than in either parent, very broad at the base, tapering gradually to a small apex, and have never shown the jointed formation characteristic of *C. Veitchii*. The plant differs from *C. Turneri*, a species from Java to which it has been compared in this latter particular, and is superior to it in other respects. With the exception of being a trifle wider, the leaves bear a strong resemblance to those of the male parent. The racemes are shorter than in *C. Veitchii*, not so erect, and yet with a less conspicuous arch than the inflorescence of the seed parent, and they are produced more freely than in either parent. The larger flowers, with a more even spread to the parts, are arranged as compactly as those of *C. Veitchii*, the color being of a purer white than in *C. vestita rubro-oculata*, with a larger, though less dense, blotch of a reddish tint at the base of the lip. The illustration on page 17 is reproduced from a photograph of the raceme of the plant exhibited in Boston.

Some time ago a representative of the Messrs. Sander & Co. purchased a portion of the stock of this Calanthe, and sent a plant of it to Dr. Reichenbach with the suggestion that it be named after Mr. Eyerman, of Easton, Pennsylvania, well known as a collector of choice Orchids; but Dr. Reichenbach died before he had published any description or name of the plant, which is now locked up in his herbarium. Specimens have been sold at auction, however, under the provisional name of *C. Eyermanii*.

Mr. Gardner has another promising hybrid Calanthe which is also the result of crossing *C. Veitchii* and *C. vestita luteo-oculata*, but in this instance the latter is the male parent. Here the flowers resemble those of the pollen parent in color, but the white is the purest I have yet seen in a Calanthe, and the yellow of the eye is beautifully delicate. In all other respects this plant resembles *C. Veitchii*. But a correct estimate of its good qualities can hardly be given yet, for, although raised at the same time and place as the other hybrid, the plant, having passed through many vicissitudes, is still small.

There is in existence another hybrid Calanthe, *C. Sedeni*, which claims the same parents as the so-called *C. Eyermanii*. It was raised by Mr. Seden at the well known London establishment of Messrs. James Veitch & Sons. In color the flowers resemble those of *C. Veitchii*, and they show an appreciable improvement in size. I am not aware, however, which is the pollen parent in this case, but, in view of Mr. Gardner's experiences, it is probable that *C. Veitchii* was the seed-bearer. Perhaps the experts of the Veitchian establishment can throw some light on the matter.

Cambridge, Mass. *M. B.*

Foreign Correspondence.

London Letter.

Cattleya Warocqueana.—I have received the following note from M. Lucien Linden, Director of *L'Horticulture Internationale*, Brussels:

"I read in the Garden and Forest for November 26th a note by you on *Cattleya Warocqueana* in which that new introduction is referred to *C. Gaskelliana*. I have too often had occasion to recognize the fairness and courtesy of your criticism in that journal to think of complaining of your judgment with respect to this Cattleya, but I would like to call your attention to the fact that some of the best judges have recognized in *C. Warocqueana* the *C. labiata autumnalis*, a view confirmed by the time of its flowering and the form of its flowers; also that the numerous varieties of *C. Warocqueana* that have flowered with us, of which some have been exhibited in London, are much superior to the best forms of *C. Gaskelliana*. I can also assure you that *C. Warocqueana* comes from a locality very far removed from the habitat of *C. Gaskelliana*."

I have not seen among the plants of *C. Warocqueana* exhibited by M. Linden at the meetings of the Royal Horticultural Society any that could be considered identical with the autumn flowering *C. labiata*, now called *C. labiata vera*. The opinion that such might be the case was discussed by the Orchid connoisseurs at the meetings of the Royal Horticultural Society, but obtained no support. By the side of M. Linden's *C. Warocqueana* were exhibited plants of *C. Gaskelliana* (which, of course, is also a variety of *C. labiata*), and the opinion of those qualified to speak on this subject was as I expressed it in the note in Garden and Forest to which M. Linden refers—namely, that whilst there was no clear line of separation between *C. Warocqueana* and *C. Gaskelliana*, the plants of the former shown by M. Linden were better forms than any yet seen of *C. Gaskelliana* as introduced seven years ago. As already stated by me, some of M. Linden's flowers

were not unlike those of *C. speciosissima*, now called *C. Luddemanniana*, which blooms in October. Certainly I have seen in *C. Warocqueana* forms of most exquisite beauty, quite as striking and attractive as any of that section of the Labiatæ group to which it belongs. The geographical point referred to in M. Linden's note cannot be taken for much alone, as the distribution of *C. Loddigesii*, of *C. Dowiana*, with its subvariety *aurea*, and of *C. superba*, indicates. Slight variations are certain to occur in different localities. It is only in the case of Orchids that these slight differences are seized upon as good specific characters.

A HYBRID STANHOPEA.—The first hybrid in this genus has been raised in Germany by a Mr. Weber, who crossed *S. oculata* with *S. tigrina*, the result being a hybrid intermediate between the two parents and inferior to *S. tigrina*. The Stanhopeas are all interesting and good garden plants, but they do not find much favor in England. This may be partly owing to the fugacious character of the flowers, although they last quite as long as the flowers of many popular Orchids. Such species as *S. tigrina*, *S. insignis*, *S. platyceras*, *S. grandiflora*, *S. Devoniana* and *S. Bucephalus* are worth a place in every good collection. They are very easy to cultivate, they bloom annually, their flowers are large, fragrant and richly colored, whilst structurally they are more remarkable than most Orchids. A picture of Mr. Weber's hybrid is given in the December number of *Gartenflora*.

CYMBIDIUM TRACEYANUM.—This plant was sold by auction last week, and realized seventy-five guineas. It was bought by Mr. Sanders, of St. Albans, who sent a flower to Kew for determination. Mr. Rolfe considers it is only a variety of *C. Hookerianum*, the *C. grandiflorum* of Wallich. The only difference between the type and this high-priced plant is one of size, the flowers of the latter being nearly an inch wider than those of the former, which are five inches in diameter. Here is an instance where size makes a difference of seventy guineas in value.

FLORISTS' FLOWERS.—The editorial remarks in GARDEN AND FOREST (iii., 569) with reference to the "improvements" made by florists in the size and form of flowers are endorsed here by all except those who consider grossness of quality in a flower the acme of perfection. What is perfection in a flower? To some florists it is rank heresy to speak disparagingly of double flowers or big flowers or over-formal flowers. The bigger or more double a flower, the better it must be. The late Mr. Hibberd used to say, "Let this class go their own way; they have their own ideas of perfection, and in their efforts they do an enormous amount of good work which is easily separated from the bad." Even double and huge-flowered Begonias have a special interest as showing the wonderful power to vary inherent in all plants, which requires certain simple conditions to bring it out. Mammoth turnips and cabbages are only a few examples of what cultural skill will achieve when its aim is to produce size. It is only when size is repulsive that objection is strong. With regard to double flowers I am of the opinion that except in a few cases they are less attractive than their single-flowered progenitors. The Carnation, the Chrysanthemum, the Gardenia, the Almond, and, of course, the Rose, are the exceptions.

Fig. 3.—A Hybrid Calanthe.—See page 16.

QUERCUS TINCTORIA.—Mr. Anthony Waterer has forwarded some leaf-branches of his "Knap Hill" variety of what he calls Scarlet Oak. He also states that "the leaves are still hanging thick upon the trees." As this was written on December 17th, after a fortnight's severe frost and fog, it is clear that Mr. Waterer's Oak is an unusual one. *Q. tinctoria* as represented at Kew has been leafless for some time. Of course there is a great difference between these Oaks as grown on the poor gravelly soil at Kew and in the famous Knap Hill Nursery, where the soil is exceptionally deep and rich and the situation sheltered. At the same time it is risky to attempt to name an Oak of this character from leaves alone. The rich chocolate crimson of the leaves of Mr. Waterer's Oak, together with their persistency in frosty weather, give it an exceptional value, in England at any rate. After comparing the leaves with specimens with the help of Mr. Nicholson I am driven to own that the Knap Hill Scarlet Oak may be *Q. tinctoria* or *Q. coccinea* or a hybrid, or something else. [The Knap Hill Scarlet Oak is *Quercus coccinea*.—ED.]

London. *W. Watson.*

Cultural Department.

Notes on Some Hardy Wild Roses.—II.

Rosa blanda is a very hardy Wild Rose, belonging to the Cinnamon Rose group, which is found more or less commonly throughout the north-eastern part of North America. The type is a dwarf plant, rarely growing more than three feet in height, and probably hardly averaging over two feet, and it is particularly distinguished by having its stems wholly unarmed or bearing very few prickles. The leaflets are usually large, and the flowers, which appear a week or ten days later than those of *Rosa acicularis*, are also above the average in size, fragrant and of a bright rosy color, and often borne singly. The large, roundish, dark-red colored fruit, with persistent sepals, is often brightly conspicuous as it hangs just above the snow along road-sides in its native habitat, notably in the valley of the St. Lawrence River. In its natural haunts it seems to prefer rich rocky soils.

Little seems to have been done to improve this plant from the gardener's point of view, but on account of its large blossoms and unarmed habit it may be made a parent of some useful hybrids. As this species extends westward it seems to become more variable, several varietal and specific names having been given, which are considered as simply forms or varieties of *Rosa blanda* by other authors. Some of these plants are characterized by having more numerous flowers, in corymbose clusters, and by their prickly stems.

Rosa Nutkana, a native of the Rocky Mountain region and the Pacific slope from northern Utah to Alaska, appears in cultivation at the Arboretum as an exceedingly strong, stout-stemmed species, growing from six to eight feet in height. The stems bear a few strong recurved spines, which are often very broad at the base, so that they are almost triangular in shape. On many plants there are few or no prickles, and the flowering branchlets are perfectly smooth. The first flowers appear at about the same time as those of the last species. They are usually solitary, and average about two inches or more in diameter, and are of a delicate pale, pinkish red color.

The erect habit of this species, its thick, clean stems, which attain a height of three or four feet without branching, and its comparative freedom from spines, may make it a desirable plant to form tree-like or standard bushes upon which to bud or graft other garden varieties, as is often practiced upon the Dog Rose in Europe. *Rosa Nutkana* does not spread from suckers, and it is perfectly hardy in this latitude.

What has been classed as *Rosa pisocarpa*, a species from California and the Pacific coast region, appears very variable in habit under cultivation. Sometimes the plants are moderately tall and bushy, while others have stems as high as those of *R. Nutkana*, but not so coarse and stout. The spines are more abundant, though very much smaller, and prickles are numerous. The flowers are not so large, and are usually of a much deeper color than those of *R. Nutkana*, and the fruit is small and globose. There is some confusion as to the limitations of *R. pisocarpa*, as well as of a number of other western species of Rose which are too little known by botanists and in cultivation to give any idea of their value.

Rosa gymnocarpa, whose habitat is also the western side of the continent, is a slender, sometimes long stemmed, species, which, although it lives through our winters, does not yet appear to be sufficiently vigorous and enduring to be very satisfactory here. The flowers are rather small, of the usual pale rose color, though forms with white flowers are found. It seems to be more closely allied to the Asiatic *R. Beggeriana* than to any other species in cultivation.

Rosa rugosa also belongs to the Cinnamon group of Roses, with one or more species of which it appears in gardens to have exchanged pollen, which has produced forms intermediate between the two parents. Some of these have been sold as *Rosa rugosa*, a fact which is to be regretted, because these plants are generally much inferior and less beautiful in foliage and flower than the typical species. *R. rugosa* and its white variety easily rank among the most beautiful of the very hardy Roses in cultivation; and, either for its thick glossy foliage, or on account of its flowers, which, under good cultivation, expand four or even five inches across, or for the sake of its large rich red fruit of late summer and autumn, it is a desideratum for any garden. It is one of the hardiest species, and will stand twenty-five degrees or more below zero without any apparent injury. It may be called a perpetual blooming Rose, for although it has only one regular period of profuse flowering, it continues to bear blossoms as freely as a Hybrid Perpetual until checked by frosts. This species is now being used in hybridizing with others in the hope of obtaining even better Roses than any we now have.

So far, the double flowered forms have, as a rule, proved less interesting than the single blossomed type. There is much variation in the depth of color of the flowers of different plants, those having the deepest purplish red blossoms being the best. The white form is very desirable. The prickly character of the whole plant is objectionable, but it is exceeded by the dense and formidable covering of prickles which protect the stems of *R. Kamtschatica*, a species closely resembling *R. rugosa* and possibly only a variety of it.

It has been stated by some writers that the thick, rugged, dark green foliage of *Rosa rugosa* was not liable to attack by the usual Rose-injuring insects. This is not the case, however, for the Rose-slug (*Selandria rosæ*), the Leg-Hopper (*Typhlocyba rosæ*) and other insects sometimes attack it quite freely, but the thick, leathery character of the foliage serves to make equally serious invasions less noticeable than in other thinner leaved species. The flower-buds of this, and some other wild Roses in the Arboretum, are often destroyed by a well known and widely distributed red-colored snout-beetle (*Rhynchites bicolor*), which eats holes into the buds, and whose larvæ live within and destroy the fruit.

Arnold Arboretum. *J. G. Jack.*

Winter Pears for Market.

THE Anjou pear I regard as the queen of winter pears for the table. It possesses all the virtues of a perfect pear, being rich, vinous and melting, with keeping qualities not excelled by any pear of its season. It is large, of pleasing shape, fragrant, and when fully ripe of a warm straw color. Coming into market when all fall pears are gone, it may be kept from November until March. As a market fruit it is always in ready demand wherever known, and brings the highest price, $5 to $6 per bushel for fine selected fruit. The tree is hardy, vigorous, not subject to blight, does not overbear, and hence requires little thinning, while few inferior fruits are seen on the tree.

Anjou does well as a standard or a dwarf. It should be planted in well-prepared, rich, dry ground and kept under the best cultivation, enriching it every year alternately with a moderate dressing of well decomposed stable manure and hard-wood ashes. A thin sprinkling of salt during winter is also beneficial. Pruning is very important to keep up the vigor and health of dwarf trees and also to prevent overbearing. Dwarf trees that have been maintained under proper cultivation, and have been properly pruned, may be seen producing excellent crops of fine fruit after a half century of existence. Most of the dwarf Pear-orchards throughout western New York are neglected in most, if not in all the above requirements, and therefore their lease of life is short and unsatisfactory.

The Winter Nelis is one of the finest winter pears, and a great favorite in eastern markets. The fruit is of medium size, melting, and possesses a rich aromatic flavor. For a dessert pear in respect to size, color and quality it has no superior among winter varieties. Its season is from December to March. Winter Nelis should be grown on Pear stock, or double-worked on dwarf stock, White Doyenne being the best tree for double working. A slender grower, in order to obtain bearing trees within a few years, it should be top-grafted on good-sized, vigorous trees. It often overbears, and requires thinning, otherwise the fruits prove inferior in size and quality. Indeed, too much stress cannot be laid upon the necessity of thinning, not only with pears, but with all other kinds of fruit.

By all who have tasted the Josephine de Malines when well grown and ripened this will be pronounced one of the very best late-winter pears. The fruit is medium to large, the pink or salmon-stained white flesh, melting and of a delicious rose aroma. This succeeds either as a standard or dwarf. Its season is from January to April. Owing to its moderate, irregular growth, it is little propagated in nurseries, and on this account is not much disseminated.

Lawrence, largely grown in some sections of our state, is held in high esteem by those who prefer sweet pears. The fruit is medium to large, melting and of pleasant flavor. Its season is from December to January. The tree is a moderate grower and very productive.

Clairgeau is the largest and most attractive early winter pear in cultivation, and always commands the highest price. The fruit is very large, pyriform, yellow and red, with its red cheek usually very highly colored, nearly melting, and keeps till January, the tree being a good grower and an abundant bearer. This is a very valuable market pear.

I have thus briefly referred to the best winter market pears that have come under my observation. Others might be added, but none, all requisites considered, equal to those specified. This is applied to winter market pears solely.

The pear for market and the pear for the amateur are two different matters. And yet, while the list might be increased in the latter case, where quality is the main consideration, it would be, nevertheless, difficult to name any finer winter pears for the table than Clairgeau, Anjou, Winter Nelis and Josephine.—*George Ellwanger in Popular Gardening.*

Bartell's Dewberry.

ONE of the most encouraging phases of pomology in this country at the present time is the progress we are making in improving our native fruits. Within the past half century many valuable varieties of the native Grape have been developed, and as the result our markets are now abundantly supplied with this delicious fruit. The tender foreign Raspberry has been supplanted by hardy native varieties, and the same may be said of the Gooseberry. In the north-western states improved varieties of the native Plum are gradually coming to the front and give promise that plums of good quality may soon be grown in our coldest states. The Crandall Currant seems to be a step forward in the development of a new species that may yet prove valuable, and the dwarf Juneberry and Buffalo-berry are beginning to receive attention. The garden Blackberry, now a valuable market fruit, appears to have been entirely developed in this country, and of more recent introduction to culture is the Dewberry, which, if we may judge from its best showings, gives promise of developing into one of our most delicious and productive small fruits.

It is only within a few years that the cultivation of the Dewberry seems to have been attempted. The earliest mention I have seen of any attempt of this kind was in the *Massachusetts Ploughman* in 1882. This was before the introduction of any named variety so far as I know. Within the past few years the Lucretia and Bartell's Dewberries have been rather extensively advertised in nurserymen's catalogues. But not all of the testimony from those who have tried them has been favorable, though occasional reports have been very flattering.

My experience with the Dewberry at Geneva, New York, was quite unsatisfactory. The variety tested was called Mammoth, and it proved a decided failure. But in the summer of 1889 I saw a small plantation of Bartell's variety on the grounds of Mr. H. C. Adams, of Madison, Wisconsin, that at once established my faith in the possibilities of this fruit. I was informed that the most productive season had passed at the time of my visit, and that the berries which I saw were inferior in size to those gathered a few days earlier. But at this time the vines were fairly well loaded with fruit of larger size and more attractive appearance than the finest blackberries, and, to my taste, altogether superior in quality. There is a juicy, melting quality in the dewberry that is scarcely equaled by any other fruit of my acquaintance.

Fig. 4.—Bartell's Dewberry, natural size.

The fact that the Dewberry is prostrate in its habit of growth is a decided objection to it in climates where winter protection is unnecessary. But in regions of severe winters the ease with which the plants may be covered is a partial recompense for this fault. It is said that a plantation once started is eradicated from the soil with considerable difficulty, which, if true, is an additional objection to the plant in cultivation.

I consider Bartell's Dewberry worthy of trial by all who are interested in testing new fruits. Mr. Adams, who is an extensive grower of Blackberries, has found this variety more profitable as a market fruit than any Blackberries he has grown.

The accompanying illustration is made from a specimen taken after the height of the fruiting season had passed. It would not have been difficult to have found larger fruits and much larger clusters at an earlier date.

University of Wisconsin, Madison. *E. S. Goff.*

Notes from Wellesley.

Reinwardtia trigynia and *R. tetragynia* are old-fashioned winter-flowering greenhouse plants now blooming here which deserve more general cultivation. They belong to the Flax family, and are nearly related to the typical genus Linum, to which they have sometimes been referred. Their habit is semi-shrubby, flower clear yellow; and although the petals are fugacious the flowers are produced in such abundance as to remain showy for five to six weeks during December and January. Old plants may be divided yearly, but cuttings taken from non-flowering shoots make neater plants.

Streptosolon Jamesonii, the handsome greenhouse evergreen, is the only species of the genus, and was sent out as *Browallia Jamesonii* many years ago. It is still a comparatively uncommon plant. I have grown it for two years, and had almost come to the conclusion that it had little to recommend it, until recently I saw two fine trained standards in a neighboring greenhouse. I had grown mine planted out, and so treated they made coarse, rambling plants which never flowered well; but treated as standards, continuously in pots, the growths are shorter, they can be better ripened, and the beauty of the plant is increased by their taking a graceful, weeping habit. The flowers are orange yellow, borne in elegant panicles at the ends of the branches, and they last for a long time. Propagation is by cuttings in early spring; they root easily. This plant requires a good rich loam and abundance of water during the growing and blooming season.

Daphne Indica is not so frequently met with as it should be. It is almost indispensable in any conservatory for the odor of its flowers. Although having handsome bright green foliage it is an ungainly plant no matter how it is grown, but wherever the flowers are, in view or out of sight, their presence will be felt. It is propagated by cuttings or grafting. Cuttings of half ripened growths taken off with a heel and inserted in sand without bottom heat are pretty sure to root, although they may take two months to do it.

Clematis indivisa is a rare and pretty white flowering greenhouse climber from New Zealand. Mr. Harris has trained it to the roof of the Odontoglossum-house, in company with Lapagerias, which position seems to suit it exactly. Though not so handsome as many of the summer-blooming species of the northern hemisphere, it is yet a very interesting plant.

Lachenalias are not now required to fill the position they once did. They are remnants of the time when it was customary in all large places to have a house for South African plants alone, from whence they come. They are still grown because of a dislike to discard anything really good. The genus is here represented by two of the best, *L. tricolor*, and its variety, *Nelsoni*, the latter raised by the late Mr. Nelson, of Alborough, England, an amateur who made a specialty of these charming bulbous plants. In appearance they somewhat resemble a Squill, with mottled leaves and pendant waxy bells of yellow, red and green in mixture. It will not do to force them; their growth is slow, beginning about September, the blooming season in a cool greenhouse being February. In England, Mr. Ingram, of Belvior Castle, uses the common *L. tricolor* for bedding purposes, keeping the plants over winter in a cool frame, where their blooming season is retarded until March and April. They increase freely by bulblets produced naturally, and blooming the second year.

Wellesley, Mass. *H. G.*

Work of the Season.

THE great variety of work now pressing in the many departments of the garden makes this one of the most interesting periods of the year to the in-door cultivator. Among the tender-foliaged plants, such as Marantas, Dieffenbachias, Alocasias, Begonias, and others of like character, the increasing power of the sun will be felt, and light shading will be found necessary, though this should be applied with judgment, as over-shading is fully as injurious to most plants as is the other extreme. The use of one of the many different shading materials, such as muslin, burlap or other cloth, or that formed of light wooden strips linked together so that it can be rolled up in cloudy weather, is undoubtedly the best system of shading, but as such appliances add considerably to the running expenses of a place, they are frequently supplanted by cheaper devices, and among these naphtha and white lead, mixed to about the consistency of milk, and applied either with a brush or syringe, is one of the most serviceable. Even whitewash will give good results, except for the fact that it removes the paint from the wood-work wherever it is applied. In the Palm-houses little or no shading is required so early in the season, except for some of the soft-leaved species, such as Calamus, Verschaffeltia, and most of the Geonomas.

If one could only secure perfect glass for glazing the houses there would be less need for early shading, but one imperfect square of glass may ruin several fine plants in a few hours, and it is therefore best to be on the safe side. And speaking of glass brings to mind the fact that some of the large Rose-growers are now using second quality of French glass in preference to first quality American glass, on the ground that there are fewer imperfections in the French glass and consequently less injury is done to the foliage beneath it, while the cost of the two qualities quoted is about the same.

Where the early forcing of flowering plants is practiced this operation will now be under full headway, and it will be necessary to give proper attention to every detail. With Lily-of-the-Valley one of the necessary conditions for successful early forcing is to allow the pips to freeze thoroughly before they are brought into heat. This fact is so well recognized by large commercial growers that they secure this condition by means of cold storage houses; this arrangement, though costly, rendering them independent of the weather.

For Tulips, Narcissus, Hyacinths and other Dutch bulbs the freezing process is not essential, and as these may be brought into flower with moderate heat they are naturally among the most popular and satisfactory plants with amateur cultivators.

A succession of *Lilium Harrisii* and *L. longiflorum* should be arranged, as the former may be had in flower by Thanksgiving-day, and by successive lots a supply may be kept up until spring. *L. longiflorum* will not force as early as *L. Harrisii*, but from the latter part of February or beginning of March and onward this exquisite Lily may be enjoyed in all its pure-tinted loveliness.

Other easily forced spring flowers are the Indian Azaleas, among which the old Fielder's White and also Alba are of the easiest to manage, though Deutsche Perle and Flag of Truce may also be brought in early, and are far superior in flower to the first named. Among the host of colored Azaleas, Madame Vander Cruyssen is by far the best for early work, while Charmer, a large-flowered, dark pink variety, is also good, but is not quite as shapely a grower as Madame Vander Cruyssen.

Some Genistas will also be brought in from the cold-house from time to time in order to continue a supply of their graceful racemes of bright yellow, and it is well to remember also that the present is a good time to put in cuttings of these useful plants, in order to secure strong, stocky young plants for next winter. Rose-cuttings, and also those of Carnations, Bouvardias and similar stock for next season, should now be provided, while the time for sowing seeds of a multitude of plants for summer bedding is at hand. The usual complaint at this time is lack of space for some of these very necessary operations, but it should be borne in mind that drawn up seedlings seldom make satisfactory plants, and it is therefore wisest to limit the varieties in accordance with the space at command. If Ferns are grown this is also a good season in which to sow spores, from the fact that the growing season for most of the exotic species is now about to begin, and in fact in many cases has already begun, and seedlings started now usually make more progress than when sown later.

Holmesburg, Pa. *W. H. Taplin.*

Orchid Notes.

Cœlogyne cristata.—This is an old favorite with Orchid-growers, and it makes a host of new friends for itself every year. It is very beautiful at this season, the graceful racemes of pure white flowers, with conspicuous marking of yellow in the lip, being produced in great profusion from the base of the most recent pseudo-bulbs. Where there are a number of plants a succession of bloom may be maintained from the middle of December to the latter end of February by confining to a lower temperature those whose flowering it is desirable to retard. They may be returned to the normal conditions as occasion demands. The plant loses somewhat in some hands by being too severely dried off after the growing season. During the blooming period it is far from uncommon to see the flowers associated with pseudo-bulbs much shrunk and withered, and leaves of unhealthy hue. It is true that a smaller quantity of water is demanded when the growth has been perfected, but the supply should not be withheld so far as to cause this condition. There is nothing to be gained by this rigorous treatment. The flowers appear just as freely in the company of plump pseudo-bulbs and rich green leaves, and, as a matter of course, the plants are then much more pleasing to the eye.

Maxillaria picta.—Some other species of the genus Maxillaria are better known than this one, and their superiority entitles them to much more general attention than they receive. It is a plant very easily managed. It is a native of Brazil and was introduced to Europe in 1832. The ovate pseudo-bulbs are slightly compressed, furrowed and clad with ragged brownish sheaths. They support two or three sharply pointed ligulate leaves, from twelve to fifteen inches in length, leathery, and dark green. The scapes emerge from the base of the pseudo-bulbs formed during the previous spring and summer. They are from six to nine inches in length, and each bears a single flower about two inches in diameter. The petals are smaller than the sepals; and both petals and sepals are incurved and have their margins turned slightly backward. The interior surface is dark orange with irregular brownish blotches, and the exterior creamy white, becoming greenish at the base, with numerous spots and patches of reddish purple. The sepals are further marked on the outside with a line of the latter color which traverses one-third of their length from the base. The lip is broader than the sepals and about half their length, creamy white, marked on the upper surface with reddish purple spots and with lines, which are most numerous toward the margins. The column is reddish purple and very conspicuous. The flowers are produced with great freedom during November and December, and they are powerfully fragrant. It is the odor, rather than the color, size or form of the flowers, which renders them attractive and pleasing. The plant thrives best in pots or pans, with ample drainage material, rough peat fibre and growing sphagnum. Abundance of water is required during the growing season, but afterward the supply may be slightly diminished with advantage. A constant intermediate temperature gives very satisfactory results.

Saccolabium giganteum.—Among the numerous Orchids now in bloom it would be difficult to find one more stately or one in which the colors of the flowers are more exquisitely blended. It is a plant of erect habit, the stem being well furnished with bold strap-shaped leaves about twelve inches in length, unequally notched at the apex, and of dark green color, with parallel lines conspicuously paler. The pendulous axillary inflorescence is about as long as the leaves, and it takes the form of a cylindrical raceme four inches through at the widest part, tapering slightly toward the tip. The flowers are sweetly fragrant, each an inch across, and densely packed on five-sixths of the peduncle's entire length. The sepals are elliptical, white, with pale purple spots, and the petals elliptic-lanceolate and like the sepals in color. The lip is dilated and trilobed at the apex, the lobes turned upward, bright purple, with lines of a darker tint on the upper surface and lilac tipped with purple beneath. The column is greenish white, marked with purple at the base and in front. This species succeeds best in pots, as do most of the large-growing Saccolabiums, with crocks and rough pieces of charcoal and sphagnum on the surface for the roots. The plant delights in a hot, moist atmosphere and frequent applications of water during the growing season. To promote abundant flowering it is necessary, however, that the roots and air be maintained in a somewhat drier state, and that the temperature be slightly reduced in winter. But even then sufficient water should be given to prevent the smallest degree of shriveling. Free exposure to light, but strict shading from brilliant sunshine, even at the dullest period of the year, are essential for securing luxuriant foliage.

Cambridge, Mass. *M. Barker.*

Anchusa Italica.—The Italian Alkanet, as it is called, is a member of the Borage family, and is also known as *Anchusa azurea* and *A. paniculata*, both of which names are descriptively correct, as the flowers are borne on tall panicled stems and are of a bright shade of blue. If we except the Larkspurs there are few hardy plants that possess this peculiar shade of blue; and, as the plant under consideration flowers in early summer and lasts long in perfection, its value is considerable, as it is quite hardy and also a true perennial. The Anchusas are among the easiest of perennials to raise from seeds, for these germinate as readily as those of most annuals, and as seeds are freely produced it is obviously the best means of propagation. There are several other Anchusas, but our own experience is limited to the above and to *A. Capensis*. This last species is said to be a tender biennial; but we have found it perfectly hardy in that the abundant seeds, produced rapidly, germinate around the parent plant, survive the winter and flower the following season in profusion for three months. The flowers, however, are small in comparison with those of *A. Italica*. It is a well known fact that bees are partial to many Boraginaceous plants, and to the genus Anchusa in particular. *A. Capensis* is eminently suitable for sowing in places where it can be left alone to take care of itself, as in a wild garden. The Alkanet of commerce, a deep red dye, is the product of *A. tinctoria*, a dwarf species of spreading habit.

South Lancaster, Mass. *E. O. Orpet.*

The Forest.

Forest-policy Abroad.—II.

WITH respect to the second class of forest-property, that belonging to towns, villages and other public bodies, it is again impossible to speak for the whole of Germany, except upon the broadest lines. The state everywhere exercises oversight and a degree of control over the management of these forests, but the sphere of its action varies within very wide limits. Even within the individual states it does not remain the same. Thus far, however, the action of the Government is alike, not only throughout Prussia, but in all parts of Germany. It prevents absolutely the treatment of any forest of this class under improvident or wasteful methods; nor does it allow any measure to be carried into effect which may deprive posterity of the enjoyment which it has a right to expect. How far the details vary may be gathered from the fact that while in the Prussian provinces of Rheinland and Westphalia the village communities manage their own forests, subject only to a tolerably close oversight on the part of the controlling staff, in the former Duchy of Nassau, now Prussian territory, their share in the management does not extend beyond the right to sell the timber cut under the direction of the Government Oberförster, the right and obligation to pay for all the planting and other improvements which may be deemed necessary, and the rather hollow privilege of expressing their opinion. But however galling so extensive an interference with the rights of property may appear, it is none the less unquestionably true that in France, as well as in Germany, the state management of communal forests lies at the root of the prosperity of a very large proportion of the peasant population, and the evils which have attended its withdrawal in individual cases are notorious. While, on the one hand, villages whose taxes are wholly paid by their forests are by no means rare, on the other, the sale of communal forest-property in certain parts of Germany in 1848 has been followed with deplorable regularity by the impoverishment of the villages which were unwise enough to allow it.

The relations of the state to the third class of forests, those belonging to private proprietors, are of a much less intimate nature. The basis of the relations is, however, the same. To quote again from Donner, "The duty of the state to sustain and further the well being of its citizens, regarded as an imperishable whole, implies for the Government the right and the duty to subject the management of all forests to its inspection and control." But this intervention is to be carried only "so far as may be necessary to obviate the dangers which an unrestrained utilization of the forest by its owners threatens to incite, and the rights of property are to be respected to the utmost consistently with such a result." Prussia, of all the German countries, has respected these rights most highly, and the Government exerts practically no restraining influence except where the evident results of deforestation would be seriously dangerous. Here it may and does guard most jealously the woodlands which have been called in general "protection forests," of whose many-sided influence so much has of late been said and written in America.

The state leaves open a way of escape for the private proprietor who finds himself unwilling to suffer such restriction of his rights for the public good, and shows itself willing to buy up areas, not only of Protection Forest, but also of less vitally important woodlands. On the other hand, it is ready, with a broadness of view which the zeal of forest-authorities sometimes unfortunately excludes, to give up to private ownership lands which, by reason of their soil and situation, will contribute better to the commonwealth under cultivation than as forest. In this way the forests, whose preservation is most important, are gradually passing into the hands of the state; yet the total area of its woodlands is increasing but slowly.

The policy of state aid in the afforestation of waste lands, important through their situation on high ground or otherwise, is fully recognized, but the absence of considerable mountain chains has given to this branch of government influence very much less prominence than in the Alps of Austria, Switzerland and France, where its advantages appear on a larger and more striking scale.

In closing this brief sketch of forest-policy in Prussia it may be proper to refer briefly to the erroneous ideas of German

forest-management which have crept into our literature. They have done so, I believe, partly through a desire of the advocates of forestry to prove too much, and they injure the cause for which we are working, because they tend to make forest-management ridiculous in the eyes of our citizens. The idea has arisen that German methods are exaggeratedly artificial and complicated, and the inference has not unnaturally been made that forestry in itself is a thing for older and more densely populated countries, and that forest-management is inapplicable and incapable of adaptation to the conditions under which we live. It is true, on the contrary, that the treatment of German forests is distinguished above all things by an elastic adaptability to varying circumstances which is totally at variance with the iron formality which a superficial observation may believe it sees. It is equally true that its methods could not be transported unchanged into our forests without entailing discouragement and failure, just as our methods of lumbering would be disastrous over there; but the principles which underlie not only German, but all rational forest-management, are true all the world over. It was in accordance with them that the forests of British India were taken in hand and are now being successfully managed, but the methods into which the same principles have developed are as widely dissimilar as the countries in which they are being applied. So, forest-management in America must be worked out along lines which the conditions of our life will prescribe. It can never be a technical imitation of that of any other country, and a knowledge of forestry abroad will be useful and necessary rather as matter for comparison than as a guide to be blindly obeyed. Under these conditions I do not believe that forest-management in the United States will present even serious technical difficulties. It only asks the opportunity to prove itself sound and practical.

Switzerland is a country where the development rather than the actual condition of forest-policy may best claim our attention. The history of forestry in the Swiss republic is of peculiar interest to the people of the United States, because in its beginnings may be traced many of the chracteristics of the situation here and now, and because the Swiss, like the Americans, were confronted by the problem of a concrete forest-policy extending over the various states of a common union. The problem has been brilliantly solved, and not the least important result of its solution is the fact that the people of Switzerland have recognized the vast significance and importance of the forests in so mountainous a country, and a full and hearty appreciation and support of the forest-policy of the Confederation is found in every nook and corner of the land.

The history of the forest-movement in Switzerland has not yet been fully written. I may be allowed to quote from an unpublished sketch of it by Professor Landolt, who, more than any other man, has contributed to make that history of which he writes. As the example set by a republic to a republic, as the brilliant result of the work of a few devoted men, crowned by a public opinion which they created, and rewarded by the great and lasting blessing which they have brought to their country, our country can find no worthier model, no nobler source of encouragement and inspiration.

"Soon after the middle of the last century," begins Professor Landolt, "certain intelligent, public-spirited men of Zurich and the canton of Bern (which then included Waadt and a great part of Aargan) turned their attention to the situation of agriculture and forestry in Aargan. Their object was to gain a knowledge of the conditions involved, and their surroundings, and to remove the most pressing evils.

"In the years between 1780 and 1790, the cantons, following the lead of Bern, succeeded in appointing forest-officers, whose first task was to become conversant with the actual management of the state and large communal forests, and to make suggestions for their future treatment. Partly at this time, partly earlier, a large proportion of the state forests and a few communal forests were surveyed, and a few of them were marked off into compartments on the ground, a measure of vital importance to conservative management.

"The appointment of state forest-officers is to be regarded as the beginning of regular forest-management. Great numbers of forest-regulations bearing on the most various subjects, tree-planting among others, had been promulgated in former centuries. They had been often renewed, but without forest-officers they could not be enforced.

"Until about 1830 forestry in the less mountainous parts of Switzerland developed slowly, but still in a satisfactory manner. The mountain forests, however, with few exceptions, were in complete disorder. But the following years brought new life not only into politics, but also into national economies, and the status of the forest, which last was materially improved by the floods which spread in 1834 over the greater part of the Alps. The damage which they caused was so severe that the philanthropic and scientific societies set themselves the task of searching out the cause of inundations, which became more frequent as time went on. They concluded that it was to be found largely in the improvident destruction of the mountain forests. To the fear of a wood famine, which had hitherto been the chief incentive to the advancement of forestry, there was now added another, which, if not wholly new, still had been formerly little insisted on. It was the influence of forests on rainfall and the phenomena of nature in general. The societies did not fail to direct attention to this question, and with excellent result. The less mountainous cantons, with imperfect legislation, made new laws, or amended and completed the old ones, looked after the appointment of foresters, and took the organization of the felling, planting and care of their timber seriously in hand. But the chief gain lay in the fact that the mountain cantons applied themselves to the work."

Taken as a whole, forestry has made satisfactory progress as regards legislation, the improvement of forest-management and the increased number of forest-officers, since about 1840. In 1865 the Swiss Forest-school was established (as a fifth department of the Polytechnicum at Zurich), and "provision was thus made," says Professor Landolt, "for a forest-staff of our own, educated with special reference to our own conditions."

The Swiss Forestry Association was founded in 1843. Through frequent agitation, and by setting forth what action was necessary, it has rendered great services to the cause of forest-protection. It has moved successfully, among other things, for the foundation of a forest-school, the examination of the higher mountain forests, the passage of a new forest-law and the correction of the torrents.

In 1854 Professor Landolt called the attention of the Association to the investigation of the mountain forests. In 1858 the Federal Assembly appointed a commission of three men with authority to study and report upon the Swiss Alps and the Jura in regard to geology, forestry and police regulations bearing on water supply. From the appearance of the final report of this Commission in 1861 the improvement of Swiss forestry has been kept steadily before the Confederation. In 1875 a federal forest-inspector was appointed, and a year later the first Swiss forest-law was passed. This law does not extend to the whole of Switzerland, but only to the Alps and the steeper foot-hills. More recently attempts have been made by the Cantonal Government and the Forestry Association to extend its influence to the Jura or to the whole of Switzerland, but the need of such action is not yet clearly apparent.

The passage of the federal forest-law was followed almost everywhere immediately by the appointment of trained forest-officers, and all the cantons whose forest-legislation was defective amended or completed it.

"Our forest-laws," Professor Landolt goes on, "are intended to work more through instruction, good example and encouragement than by severe regulations. This method is somewhat slower than one which should involve more drastic uneasiness, but the results achieved are the more useful and lasting. Our laws require the same treatment for the forests of the state, the communes and other public bodies."

The oversight of private forests is less strict. Their owners may not reduce the area of their woodlands without the consent of the Cantonal Government; they must plant up the land cut over which is without natural growth, and they are bound to take proper care of the growing stock, but they are not held to a conservative management. In "protection forests," on the other hand, the timber that may be cut by private owners is marked out by Government officers, so that reckless lumbering may be prevented. The regulations which look to the formation of new protection forests must also be conformed to by private proprietors, or they must allow themselves to be expropriated. In these matters the Confederation and the cantons work in unison. The consent of the Federal Assembly is necessary to the clearing of private land in protection forests.

It hardly needs to be added that the present condition of forestry in Switzerland is admirable. Systematic forest-management has probably been known there as long as anywhere in Europe, and nowhere can finer individual examples be found. I have seen nothing, even in Germany, which seemed to me so workmanlike as the management of the Sihlwald, a forest belonging to the city of Zurich; and I am the bolder in my opinion because the Sihlwald (Garden and Forest, iii., pp. 374, 386, 397) has been called the most instructive forest of Europe by, perhaps, the most experienced forester of the present day.

New York. *Gifford Pinchot.*

Correspondence.

Tuberous Begonias.

To the Editor of GARDEN AND FOREST:

Sir.—Not every one who is familiar with the species and has watched the marvelous development of the hybrid Begonias will agree with all the views expressed in a recent article, entitled "Form in Flowers," in GARDEN AND FOREST. "Spoiling the flowers" is a familiar cry to the reader of horticultural literature, and we have had the same warning and very much the same arguments over all florists' flowers which those who are deploring the fate of the Begonias are now advancing. "Nature gives us the Ramanas and the Cherokee Rose, the florist produces Paul Neyron." So runs the complaint, and it seems a severe arraignment till the florist finds time to remark that besides Paul Neyron, his art has also produced La France, The Bride, Catherine Mermet and others which seem to have been overlooked in the course of the argument.

While there are certain ill defined canons of taste recognized among people of intelligence, yet practically we all decline to believe that anything which gives us pleasure has no beauty. I have no desire to enter into an unprofitable discussion on the beauty of form or the lack of it in the new Begonias, but simply wish to call attention to the conception of "Nature's Begonia," on which the argument is based. The type as Nature designed it, we are told, is a low dwarf plant with weak peduncles and small, drooping flowers of somewhat irregular outline. But taking the entire family of tuberous Begonias, of which there are about a score of species in cultivation, the combination specified is on the whole a rather rare one. The rule, if there is one, among the very diverse habits of these plants, is that the dwarf ones have stiff flower-stalks and the tall kinds weak ones, while there seem to be at least as many flowers of regular as of irregular shape. But most of our hybrids have been made from *B. Boliviensis*, *B. Pearcei*, *B. Veitchii*, *B. Davisii*, and in a smaller degree from *B. rosæflora* and *B. Clarkii*. *B. Boliviensis*, a tall plant, is responsible for the weak peduncles appearing so frequently in the hybrid Begonias, especially in the double varieties, the first of which were derived from that species. From a cultivator's point of view a flower on a low plant which has a peduncle so weak as to allow it to lie on the ground like a boy's sucker is not very desirable, and after supplying one's wants for hanging baskets, etc., such varieties are usually discarded by careful growers. There does not seem to be any inherent objection to trying to secure seedlings of the Davisii type with dwarf habit and fine flowers on stout, erect stems. We could hardly have too great an abundance of such pure colors, and if the flowers are sometimes rather large, this fault would regulate itself, for under ordinary treatment they are generally but little larger than those of some of the types. No doubt many inferior forms have been sent out, for every plant produces a salable tuber, and the margin of the florist is so small that he cannot be expected to throw away a plant so readily marketable. But after all, instead of assailing the hybridizer for lack of taste, why not encourage him in the production of what is new? Suppose some of the seedlings are not beautiful according to some ultra-Japanese standard, many of them will be sufficiently wayward and whimsical to suit the hyperæsthetical, and many more will delight those whose tastes are less highly educated, who can endure a regular flower and even admire a double Camellia.

Now is a good time to get some seed of one of these naughty hybridizers, for if sown at once they will commence to come into bloom in early June. The culture from seed is of the simplest. Use light soil, sow thinly on the surface and cover pan with glass. They will germinate in a fortnight, and even in the seed-leaf stage will stand considerable neglect. They should be dibbled out when small and kept growing at not too high a temperature. One can scarcely have too great a stock of these plants either for the garden or greenhouse.

Flatbush, L. I. *Quis.*

[If our correspondent will take the trouble to read again the article on which he comments, he will find not a word in disparagement of hybridizing. What the article maintained was: That increased size alone is not necessarily improvement; that a certain irregularity of outline which is pleasing in small flowers may be disagreeable when exaggerated in larger ones; that stiff perpendicular stems with a flower at the top, face upward, is no improvement on the graceful drooping habit of most Begonias, and that in many plants (not all) the single natural flowers are more beautiful than those which have been doubled by the gardener's art. "Quis" admits that "many inferior forms have been sent out," and we agree with him that the grower can hardly be expected to throw away marketable tubers. And yet it is well to insist now and then that flowers are not always beautiful merely because they are new or big or perfectly double.—ED.]

The Owl and the Sparrow.

To the Editor of GARDEN AND FOREST:

Sir.—Your pleasant correspondent, Charles Naudin, has some interesting notes on the *Stryx passerina*, a bird of whose existence I may as well confess my ignorance. The suggestion of any process which promises to aid in the extirpation of that admitted pest, the English sparrow, is alluring, but in avoiding Charybdis we often fall upon Scylla, and it occurs to me that our pigmy friend, who is, to quote Mr. Naudin's description, "a ferocious and well-armed bird," who "not only exterminates the sparrows' nests, but drives them away entirely by its presence alone from any locality," is a party to be respected certainly, but distrusted as to his ability or willingness to draw the line at English sparrows. I think your correspondent, who praises him possibly not too highly, would hardly care to "seal to such a bond" as would guarantee his discriminative powers in this respect. Like the writer, there are doubtless a few of your readers whose suburban experience, having a retrospect of something over half a century, includes, among other pleasant memories, recollections of countless mornings in years long past, which in one respect at least answered to Milton's beautiful description as "Sweet, with charm of earliest birds." That these are now mainly matters of reminiscence is largely due to the thoughtless and unfortunate introduction of the English sparrow. The diminished ranks of the native inhabitants of our orchards and hedge-rows are ill-conditioned to face a new marauder of the type Mr. Naudin describes, and it would seem to be the part of prudence to keep the Atlantic between us and the fierce little Chevêche until we are better informed as to his preferences and limitations. While we admire his valor, we may fairly question his discretion, and before making further reckless ventures we ought to be well assured, as between the English sparrow and the Chevêche, that this is not a case where "bad begins and worse remains behind."

West Roxbury, Mass. *W. H. C.*

[We have received letters containing the same warning from several correspondents, and should be glad to hear from others who have some knowledge of the habits of the Pigmy Owl.—ED.]

Recent Publications.

Outings at Odd Times. By Charles C. Abbott. New York: D. Appleton & Co.

Dr. Abbott has found another felicitous title for this latest addition to his series of out-of-door books. He saunters through upland and meadow, along woodside and brookside, to discover in every well-tramped highway and byway a freshness that never fails in the familiar forms of lowly life. The oftener he strolls among the familiar scenes where he has so often invited his readers to accompany him, the more thickly throng the surprises among the shrubs and weeds, the reptiles and insects, the birds and "small deer," for one who has eyes to detect them. And what Dr. Abbott sees he can weave into a narrative so entertaining that reading it is the next best thing to actually watching and witnessing in detail the modest events in the history which Nature keeps making day by day all the year long.

The book is so much in the vein of its predecessors that what has been so often said of their scope and quality will answer as a characterization of this one, and yet it differs somewhat in its flavor from the rest, and particularly from the earlier volumes of the series. It is less distinctly descriptive of our humble relatives and their ways and not so photographic in its delineation of what is seen. It is more contemplative. It treats the reader to musings on the more general laws of Nature. It is more subjective, too, and depicts the mood of the observer as often as the object mirrored in his mind. If, therefore, the reader finds fewer facts recorded he may detect more poetry; and since the book is not advertised as having merely or mainly a scientific value, he will not complain, and he may find the change not disagreeable.

Notes.

Small trees of *Araucaria excelsa* are largely used now in table decorations for large dinner parties.

Foreign journals state that the whole stock of a new Rose, Mamam Cochet, which last autumn was introduced by Charles Verdier, has been sold by him to an American, whose name is given as Mr. Ernest Asmus.

At Lafayette College, Easton, Pennsylvania, free tuition in road-building is now offered to one student from each county of the state. The instruction will be given by professors in the Engineering Department of the College.

A Stevia possessing an agreeable aromatic odor has been introduced to European horticulturists by Herr Dammann. It is a perennial, which grows only to a height of fifteen inches, is a strong bloomer, and is said to be more beautiful than any in common cultivation.

The annual report of Dr. J. A. Lintner, State Entomologist of New York, has been published, and as usual it is an important contribution to economic entomology. The illustrations are excellent, the index is complete, and the elaborate bibliography adds greatly to its value.

At the meeting of the Ohio State Horticultural Society a new Grape, raised by Mr. T. V. Munson, and said to be a cross between Lindley and Delaware, was pronounced very promising. The Colerain, a pure native seedling of the Concord type, and Nectar, a seedling, raised by the late Mr. Corywood, were also commended.

Professor Lazenby bagged some sweet cherries last year just after the fruit had set, and kept them covered until they were ready to pick. The fruit developed in this way was larger and heavier than that which remained uncovered, the skin was more tender, the general appearance particularly fresh, and the color notably brighter.

The *Bulletin of the Torrey Botanical Club* says that at a recent meeting of the club Miss Stabler "reported a peculiar growth of aërial roots in Swamp Maple as noticed by her at Great Neck, Long Island. The trees in several instances were decayed ten or fifteen feet above the ground, and roots one and a half inches in diameter had been sent out from above through this decayed growth to the ground, fifteen feet below."

Monsieur André, already distinguished by his explorations of the South American flora, made last year at the time of his visit to Montevideo an extended botanical excursion into northern Uruguay to the borders of Brazil, where virgin forests of the greatest interest were traversed, and where many trees were found of first-rate ornamental value for the future plantations of the parks and public gardens to be laid out in Montevideo under his direction. Among these there are many, he writes us, capable of embellishing the gardens of southern Europe. The results of these explorations are soon to be given to the public.

Professor George Lawson, of Halifax, in a private letter calls attention to the interesting fact that *Rhododendron Catawbiense* is likely to become naturalized in Nova Scotia. "It is nearly twenty years ago," he writes, "since I imported a few hundred Rhododendrons from Edinburgh. Many died; but all of the Catawbiense blood survived and have grown enormously. They seed very freely, and spontaneous seedlings are now seen peering out of mossy banks at long distances from my grounds. *Quercus sessiflora* is also spontaneous here with the Rhododendron from acorns of trees planted about the beginning of the century."

A "Hay Palace," recently built at Momence, Illinois, is described as being 206 feet in length and 166 feet wide in the centre. "The main hall is 103 feet in diameter, flanked on the four sides with wings. A circular gallery eighteen feet wide sweeps entirely around the main hall. The walls are built of baled hay, with just enough baled straw to make a pleasing contrast in shading and color. The primary object of the exhibition is to make a display of the varied products of eastern Illinois and western Indiana, which will include products of the farms, factories, forests, mines, quarries, and of the arts, domestic skill, and the accomplishments of the people of the district in music, oratory and manual training. A special feature is the display of the latest tools in haying machinery, and implements for ditching, laying and making tile, and road machinery."

A correspondent of the *American Architect and Building News* says: "Baton Rouge received its name from an enormous Cypress-tree which stood upon its site early in the eighteenth century, and out of which a certain carpenter once offered to build two boats of sixteen and fourteen tons respectively. The Cypress of Louisiana has bark of a reddish hue, grows to a great height, and is bare of branches excepting at the top. Naturally this particular Cypress was recognized among the pioneers and settlers as a landmark, and 'one of the first travelers who arrived at this locality,' says Le Page du Pratz, an old chronicler, 'exclaimed that this tree would make a fine stick' (a walking-stick for the Titans, presumably), 'hence the name of Baton Rouge (Red Stick), given to this place.'" The reference in this account is, of course, to the Bald Cypress (*Taxodium distichum*).

A writer in the *Illustrirte Gartenzeitung*, of Vienna, while disputing the excessive claims recently made for certain so-called "weather plants," points out the fact that a modest degree of power in forecasting atmospheric changes is possessed by a multitude of common plants. Among these he cites *Gallium vernum*, whose pleasant fair-weather odor becomes strong and pungent at the approach of rain; *Carlina vulgaris*, whose leaves close before rain; *Calendula pluvialis*, which predicts rain when its flowers remain closed after seven in the morning; *Oxalis acetosella*, which closes its leaves at the approach of rain or cold; *Lapsana communis*, which keeps its flowers open in the evening if it is to rain the following day, but closes them if fair weather is coming; *Draba verna*, which droops its leaves toward the ground before rain; and *Alsine media*, which predicts a clear day if its flowers open about nine o'clock, and a second one to follow if they remain open as late as four in the afternoon.

In his "Three Years in Western China" Mr. Alexander Hosie says: "Between Ch'ung-k'ing and Ch'i-chiang Hsien, the first city of any importance on the southern road to Kuei-chow, there are a number of factories for the manufacture of the ordinary coarse Chinese paper. . . . There is an entire absence of machinery for washing and shredding rags; there are no troughs of pulp, chemicals for bleaching, resin for watering, wire moulds for receiving and drums for firming the paper as it comes from the pulp-troughs. Bamboo-stems and paddy straw are steeped with lime in deep concrete pits in the open air and allowed to soak for months. When nothing but the fibre remains, it is taken out and rolled with a heavy stone roller in a stone well until all the lime has been removed. A small quantity of the fibre is placed in a stone trough full of water and the whole stirred up. A close Bamboo mould is then passed through the mixed fibre and water, and the film which adheres to it emerges as a sheet of paper, which is stuck up to dry on the walls of a room kept at a high temperature. The sheets are afterward collected and made up into bundles for market."

Mr. T. S. Brandegee distinguishes, in the November issue of *Zoe*, a new Poplar of Lower California under the name of *Populus Monticola*. It inhabits the high mountains of the Cape region in the extreme southern part of the peninsula, growing along streams and following down the cañons toward the warm lowlands. Young trees have a smooth, light colored bark similar to that of the Aspen, but it becomes very rough on old specimens. At elevations of five thousand feet it is rarely more than twenty feet high, but at lower altitudes it becomes a large tree nearly a hundred feet high, and is a favorite support for the wild Grape-vine. The wood is described as light red in color, and is said to be used in making furniture. The new growth is densely tomentose. The leaves are round-ovate, with a short point, variably sinuate-crenate or dentate, silky-pubescent upon both sides, especially upon the veins, with terete, white-tomentose petioles; the stipules are linear and the bud-scales white-silky; the capsules are ovate, densely white-silky tomentose, two to three-valved; styles usually two, united at the base, each with two narrow divisions. The disk is small and nearly flat; scales minutely sinuate-dentate, nearly glabrous. "This tree is known by the name of 'guerigo' to the inhabitants, who distinguish it from the common one of the fields and gardens called by them 'alamo.' The leaves and flowers appear in February, and in October all have fallen, a season of growth usual in Alta California, but very different from the ordinary habit of the plants of the Cape region of Baja California, where most of the vegetation comes forward with the summer and fall rains at the time when the cottonwoods are losing their leaves and appear to be preparing for a winter, which, however, never comes."

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The Proposed Widening of the Drives in Central Park.

IN his recent message Mayor Grant, of this city, declares that the question of widening and improving the drives in Central Park is one which demands immediate attention. There is nothing novel in this suggestion. The necessity of widening and straightening and leveling the roads of the park has often been urged by persons who assume that these roads were made primarily for pleasure-driving. But it should never be forgotten that the only excuse for the existence of such a park in such a situation is to furnish an opportunity for rural and sylvan recreation to an urban population. The scenery is the park. The drives were constructed to enable those who visit the park in carriages to enjoy the scenery just as the paths are laid to make these refreshing prospects available to those who come on foot. As has been often stated, the walks and drives are not essentially the park any more than knives and forks or glass and china are the essentials of a dinner. They are simply the means of making the park accessible and available.

There have always been persons who have insisted on the necessity of a Rotten Row, a place of gallant and festal promenade, just as others have felt the necessity of a speed-road for those whose delight is in fast trotters. No doubt both of these objects are desirable in themselves considered, and so are many others that could be named, but that is no reason for confiscating the park, or for condemning a portion of it to any such purpose. If it had been originally intended to provide a place where the wealth and fashion of the city could meet for social greeting and the display of equipage, no man in his senses would have chosen as the field for such assemblage these rugged ledges, which have since been transformed into rolling meadows and grassy dales. Some level, open space would have been selected for such a promenade; and now that the city has borrowed and spent $10,000,000 for the avowed purpose of creating the scenery of the park, it would be a breach of trust, as well as a wild extravagance, to sequester a portion of the park and devote it to alien use. These millions have been spent to develop the park in accordance with one motive; that is, in its construction and maintenance the original design of furnishing pastoral and reposeful prospects has been adhered to. Any attempt now to adapt the park to another and quite a different motive, to transform it into a display ground for stately processions, or a place for pleasure driving, would not only destroy the original intention, but signally fail to fulfill the new purpose. The result would be a spiritless compromise between two, or rather several, designs; for the men who drive fast horses and those devoted to athletic sports, not to speak of the botanists and zoologists who want gardens and the militia who desire more parade grounds, and the rest, will all insist with equal justice that their claims should be recognized.

It will be urged, as it always has been, that the roads can be widened without affecting the value of the landscape; but a little study of the ground will show that any expansion of the wheelways, besides increasing the already large ratio of gravel to grass, would not only displace and separate essential elements of the landscape, but would destroy many of the finest trees and most effective of the rugged and rocky passages in the park. The planting was, of course, adapted to roads of the present width, these roads were adjusted to the contours of the ground, and the modeling and planting of the road-sides are an integral part of the design. The widening would not only mean the destruction of slopes and banks and ledges that have been beautified with the growth of thirty years, which could not be replaced in a shorter time, but the sweeping away of trees, groups of shrubs and vine-covered rocks would open the views in front which are now masked by projecting ledges and masses of foliage, and thus destroy that charm of surprise which a winding course now ensures. Not to speak, therefore, of the immense expense of widening the roads, an expense which would include almost a complete reconstruction of the drainage system of the park, any considerable addition to the graveled roads or curtailment of the verdurous elements on either side of them would mean the destruction of the scenery which gives the park its value.

The wheelways are now ample to fulfill the purpose for which they were designed, and no park drives could be more free from obstruction. The transverse, sunken and hidden roads by which traffic can be carried on across the park, besides the numerous bridges and archways which have been so planned that it is possible for persons on foot to reach any portion of the park without crossing a carriage track, are devices which have demonstrated the foresight of the designers and more than doubled the efficiency of the wheelways. And finally, if they could be widened with no injury to the essential value of the park, this would do nothing to relieve congestion of the drives at certain points and at certain periods. As a matter of fact, whenever a roadway is widened to make room for crowding carriages this will only mean, at the point selected by fashion for a festal promenade, another file of carriages, and the throng will be more dense and impenetrable than ever. This is not a probable theory merely; it has proved true in actual practice. The promenade ground of fashion has been shifted more than once in both London and Paris within the memory of men still living, and when a wider space was made for the increasing number of vehicles the exclusives deserted it for a narrower road.

The truth of the whole matter is, that the park roads are of a width which is ample for the purpose they are meant to serve. They cannot be enlarged without serious defacement of the beauty of the park and the practical destruction of elements which constitute its unique charm and value. Even if the area of gravel should be extended at so great a cost, it would do nothing to relieve any temporary crowding of vehicles at special points which is complained of. When the throng is greatest on the East

Drive even now the equally attractive West Drive is comparatively vacant, and if after years of labor the capacity of the East Drive were doubled it would probably be deserted for Riverside or some other carriage road. The system of drives and bridle paths which are in process of construction, and are to connect Central Park with Morningside and Riverside, and which can be completed in two years, ought to offer accommodation for all who ride or drive for pleasure until the extensive park areas further north are made ready for the growing city. In this great system of roads there can be found better opportunities for those who drive for the sake of driving, or for the display of horses and horsemanship, or of dress and equipage, than can be afforded in the narrow limits of Central Park, which, it should be remembered, will soon be a down-town park. Those who visit this park on foot will multiply much more rapidly than the visitors in carriages, and if it is to serve its highest purpose for the refreshment of this thronging population, its character as a rural retreat must be preserved.

The first issue of the *Gardeners' Chronicle* for the year is a jubilee number devoted largely to a commemoration of the fiftieth anniversary of that journal's first appearance. Founded by Dr. Lindley and Sir Joseph Paxton, its policy has always been directed by men of accurate knowledge and scientific temper. Its trusted correspondents have been among the foremost of skilled cultivators and recognized authorities in the sciences related to horticulture. During its life of half a century its influence has tended to elevate and dignify the art of horticulture, not only in England, but throughout the world, and it was never more worthy to command respect than under its present management. Our venerable cotemporary is to be congratulated on the possession of so honorable a history, while its future is bright with the promise of ever increasing usefulness.

A correspondent of the *Northwestern Lumberman*, in a recent issue of that journal, describes, with the aid of an illustration made from a beautiful photograph, a small tract of virgin forest on the northern slope of the Adirondack mountains. This picture gives some idea of what these forests were before their ruin had been largely effected by irresponsible management. The tract in question consists of 1,748 acres of land, and is situated in the town of Duane, on the banks of Deer River. It is supposed to contain not less than 10,000,000 feet of pine, and the trees, as they appear in the illustration, stand close together, with tall, straight, beautiful shafts. The Pines are mixed with Spruce and hard-wood-trees, and lie in clusters on the ridges. The trees are sound, running as high as forty or fifty inches on the stump. From the northern slope of the Adirondacks it is safe to say, this writer remarks, that two-thirds of the original Pine has been cut away, although in the central portion of the wilderness large tracts are yet untouched. In the south-west corner of the wilderness are dense forests of Spruce with some Pines scattered through them. These forests, however, are now being invaded by operators on a large scale, and their ruin is only a question of time. The most extensive lumbering now being done in the northern Adirondack region is on the San Regis River, spruce and pine being cut indiscriminately. Logging railroads, as they are understood in the west, are not, however, in use, the rivers being generally depended on to float the logs to the mills.

Methods of Quickening the Germination of Seeds.

It is almost always desirable to hasten the germination of seeds, not only that plants may be obtained more quickly, but also that their long exposure to the enemies which exist in the soil and destroy them, or many of them, if seeds are allowed to remain in the ground too long before germinating, may be avoided. As a general rule, the fresher seeds are, the quicker they germinate, and, with the exception of the cases here enumerated, it is desirable to sow, as far as possible, the last seeds to ripen on any given plant. The exceptions are :

First. Where double flowers are desired, as in the case of Zinnias, China Asters, etc.

Second. Where plants are likely to be ruined by an excess of growth at the expense of heading, such as in the case of Lettuce, Cabbage, etc.

Third. Where plants are liable to produce leaves at the expense of flowers and fruits, as in the case of Tomatoes, Cucumbers, Melons, etc.

Other things being equal, seeds preserved in their natural envelopes up to the time of planting germinate much better and more quickly than those which have been washed and preserved without covering, even if kept in paper or cloth bags in a dry, equable temperature. With few exceptions, all seeds with fleshy coats should be preserved in their natural covering as long as possible. When their natural covering is removed, if the planting-time has not come, it is always safe to place the seeds between layers of fine sand containing at least ten per cent. of humidity, and so preserve them from direct contact with the atmosphere. Seeds of the Grapevine washed and dried at the time the fruit ripened, and then placed in bags and sown the following spring, germinated only in the proportion of eight to ten to the hundred the first year, while others did not germinate until the second or third year. The plants produced by these had the seed-leaves nearly always blotched with white. A part of the same seed preserved in their pulp to the end of December, and then placed in sand until the sowing-time, germinated much more quickly and in the proportion of seventy-five to eighty in a hundred. The same precaution is necessary in the case of various large oily seeds, such as the seeds of Oaks, the Tea-plant, the Camellia, Laurels, Chestnuts, Beeches, etc., which lose in a large part their power of germination if preserved during the winter in bags, and require to be sown as soon as ripe, or, at least, to be preserved in sand, and so prepared for germination when the time for sowing arrives. This is the best method, too, in the case of seeds with bony, hard covering, which germinate slowly, such as the seeds of the Olive, and of most of the Rose family, nut-bearing plants, etc. There are also a number of vegetable seeds which take a long time to germinate, such as those of the Parsnip, Carrot, Sugar Beet, Parsley and Tarragon; these are improved by being placed in layers of sand before planting, although their germination can be hastened by more active treatment. Many systems are in use for this purpose among gardeners. Sometimes good results are obtained by mixing seeds of this character with fine soil, and then, after placing them in a pot or sack, plunging them for some time into hot water. Others soak such seeds for a longer or shorter time, varying from six to forty-eight hours, in tepid water, to which is added a little salt or chlorine. Some gardeners soak Carrot and Beet seeds in liquid manure for two or three days before sowing them. All such methods are generally good if they are carefully used.

I have read of certain Indian fakirs being able to cause seed to germinate in a few minutes with a little powder, which they sell afterward to an astonished public without disclosing their secret. They are probably very skillful prestidigitateurs, and their process consists in changing the seed rapidly.

I do not recommend the method of hastening germination which consists in plunging seeds into water strongly impregnated with potassium or caustic soda. The strength of these salts is so great that if a Coffee-seed is dropped into a solution made with them, germination takes place at the end of a few hours; but seeds so treated, instead of continuing to grow, perish when they are transferred to the soil.

It is said that electricity stimulates germination. Experiments which I have made in this direction have only given moderate results, although I recognize certain results which make me suppose that with proper appliances electricity would be a powerful and efficacious means of making old seeds or seeds with hard and bony coatings germinate quickly.

I have secured the germination of seeds in half the ordinary time by plunging them during a period varying from six to thirty-six hours, according to the hardness of their coats, in water to which was added one-tenth of its volume of the liquid ammoniac of commerce.

Any process which facilitates the transformation of the starchy parts of the seed into glucose and renders it assimilable by the embryo, favors its development and hastens germination. Air, humidity and heat being the indispensable agents for this, it only remains to select the substances best suited to aid these agents in their work. That which appears to me the best is ammoniac. In practical application it is best applied in the form of fresh horse-manure or horse-manure refreshed with horse-urine, which should be used either mixed with other substances or alone, and which for this purpose should be

placed in a bed in a warm greenhouse. I have caused in this way the germination of Pear and Grape-seeds, nuts, Plum-stones, Almonds, the seeds of the Coffee-tree, of Palms, Sugar Beets, Peanuts, Fraxinella and other seeds of slow germination in half the time needed to secure the germination of the same seeds sown in the ordinary condition. In the case of Beets, Beans, Lupins, and other plants of the Pulse family, the use of heated soil produces the most deplorable results on account of the rapid development of the cotyledons, which results in the breaking and destruction of many embryos when the seeds are treated in this way. For all such seeds it is recommended to immerse them for six or eight hours in slightly-heated water, which softens the coating of the seed and facilitates the exit of the germ.

There are certainly many additions to make to the examples I have cited, my object being simply to indicate methods of making experiments through which, perhaps, results may be reached which will be of use to future generations of gardeners.—*J. B. Weber in the Revue Horticole.*

—Mr. Duncan has been much more successful than with the exterior. The latter is not altogether pleasing in outline, and its various parts seem to lack harmonious proportion and unity, while the interior is harmonious, appropriate and imposing. But when he actually undertakes his task, Mr. Duncan will have time to study his exterior in a way that was impossible before the competition, and the result will no doubt be more satisfactory.

Meanwhile, the chief interest for the readers of GARDEN AND FOREST will be with the scheme in its entirety rather than with the design of the monument as a work of architecture narrowly so-called. The site where it will stand is one of the most commanding which could be found near any city in the world, and this is to say, of course, that especial care ought to be given to its environment and approaches. To place a building, however fine in itself, on this elevated bank, in the centre of a noble driveway and close above a mighty river, and not to give architectural accent to these surroundings, would be to throw away an unrivaled opportunity. Even were the place

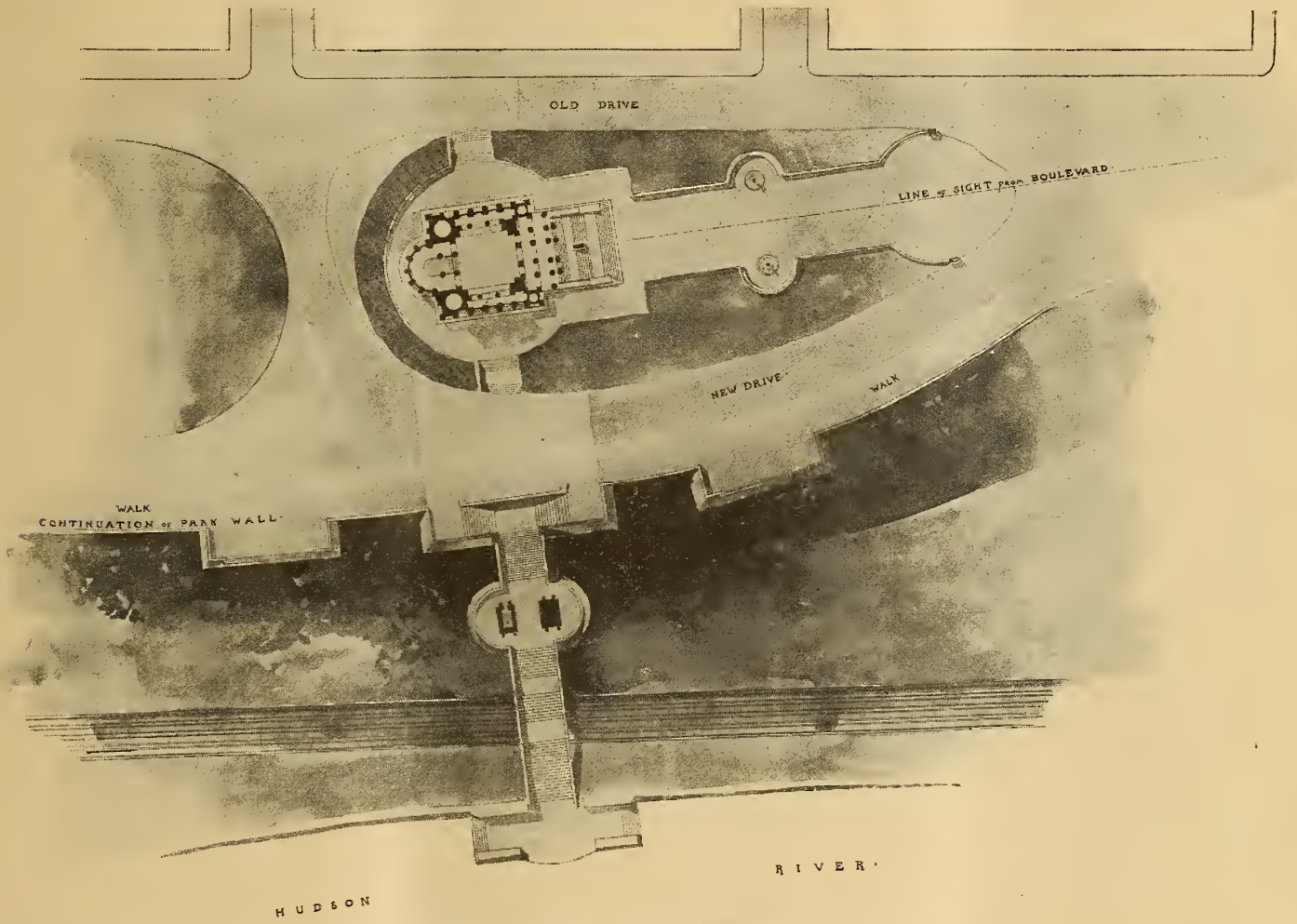

Fig. 5.—Ground Plan of the Proposed Grant Monument, Riverside Drive.

The Grant Monument for Riverside Park.

THE competitive designs for the monument to contain General Grant's tomb which were exhibited a few months ago have lately been shown again with the annual exhibition of the Architectural League in this city. It has recently been decreed by Congress that the hero's remains shall not be transported to Washington, so it is probable that, if sufficient money is subscribed, the memorial will be erected on Riverside Drive by Mr. John H. Duncan, whose design was selected, last autumn, from among those just referred to. Some of the architect's drawings (of course, on a greatly reduced scale) will be found on this and the following page. These drawings also included a large plan, a section and an elevation of the monument proper; but from the three offered a general idea with regard to the effect of the monument can be gathered. To do justice to the design the interior of the building should be shown, for here—in an arrangement which recalls, but by no means imitates, the tomb of Napoleon in the Invalides at Paris still a bare hill-side to which no artist had given his attention, and the future estate of which was still in doubt, the architect ought to consider its possibilities in his design, and, in conjunction with a landscape-gardener, ought to prescribe some extensive scheme of treatment. But an artist has already here been at work, and has laid out the noblest driveway in the world, and to ignore these preparatory labors would be doubly unintelligent. Yet, so far as could be seen from their designs, no adequate thought was given to the surroundings of the monument by any of Mr. Duncan's competitors. Of course, all of them had borne in mind the elevated character of the site, the free approaches to it, and the fact that it will be well seen from a great distance to those who shall come by land or water. But none of them seems to have felt the necessity for uniting the building to its environment in an integral way, or the desire to improve so rare an opportunity for extended and varied architectural effort. Mr. Duncan, however, has done this; and despite the superiority of his monument (in its interior at least) to that of any of his rivals,

it is not improbable that his sketches for its surroundings largely influenced the committee in their choice.

It will be seen that he has not placed the tomb quite parallel with the river-bank, but somewhat diagonally, in order to make it face the line of the Eighth Avenue Boulevard. The way in which this driveway forks, so as to afford a direct approach to the tomb and an encircling road as well, seems very intelligent, and the great flights of steps, crowned by an equestrian statue, would rise with excellent effect from the terrace. Access to the outer terrace is afforded to persons on foot by the short lateral flights of steps, while carriages would turn in front of the tomb or drive around it. But the most ingenious and interesting part of the scheme is that which shows the way in which access from the upper level to the river is supplied, meeting the practical end of allowing visitors to approach directly from the landing-stage at the river's edge, and the artistic end of bringing the river itself into the scheme and doing the best that could be done to conceal the intrusiveness of the railway. It has been objected, that the great stairway will have a ladder-like effect and ought to be very much wider. Possibly it might, to good advantage, be somewhat wider; yet, on the whole, the objection hardly seems well taken, and is apparently inspired by the inability of unaccustomed eyes to read an architectural elevation rightly. The lateral view certainly does not suggest a ladder-like effect, nor is it probable that a full view of the actual structure would do so, whatever the drawing might suggest to untrained eyes. Of course the effect is bridge-like, but the structure will be a bridge and ought to look like one. The various terraces and flights of steps and the triumphal arch which stands midway up can hardly be judged in reproductions so small as those given here. But a general idea of the scheme is all that it is proposed to give, especially as it is probable that only its general idea is as yet fixed in the architect's own mind. It may be explained, however, that the retaining wall will be masked at its base by plantations of trees; that the spaces on either side of the tracks will be laid out in a harmonizing way, and that broad zigzag driveways, which are not suggested in these hasty sketches, will ascend from the river level to the high ground on either side of the stair, supporting it to the eye and greatly increasing its dignity and the coherence of the whole design.

Of course much more money will be needed for a comprehensive design of this sort than for an isolated monument. But Americans are slow in giving money only when not convinced that they will receive its value in return, and whatever the sum they may here spend, they will get its value only if the surroundings of the monument are well considered. Mr. Duncan's design for the tomb itself shows how a portion of it may, with good effect, be built in the beginning to contain the sarcophagus, while the remainder is left for future execution. But the ultimate success of the enterprise is more important than the immediate enshrinement of the sarcophagus; and, therefore, it would seem the better plan to spend the first installment of money upon the approaches, retaining walls and terraces. Build these, and before long the tomb will surely be built. But build the tomb first, and who knows how long we may have to wait for the approaches, since the public so faintly appreciates the necessity for placing a building well even when it takes real interest in the building itself? Unless this building is fittingly placed, it will discredit us as a people incapable of valuing a magnificent opportunity; and to be fittingly placed means that it must be united with some such wide architectural and landscape-gardening scheme as Mr. Duncan's drawings suggest. It is fortunate that an architect has been selected who has shown himself capable of realizing the true nature of the problem.

New York. *M. G. Van Rensselaer.*

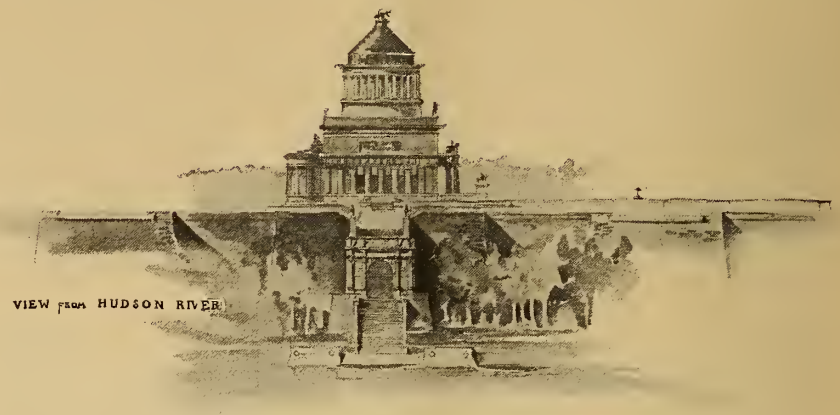

Fig. 7.—View of the Grant Monument from the River.

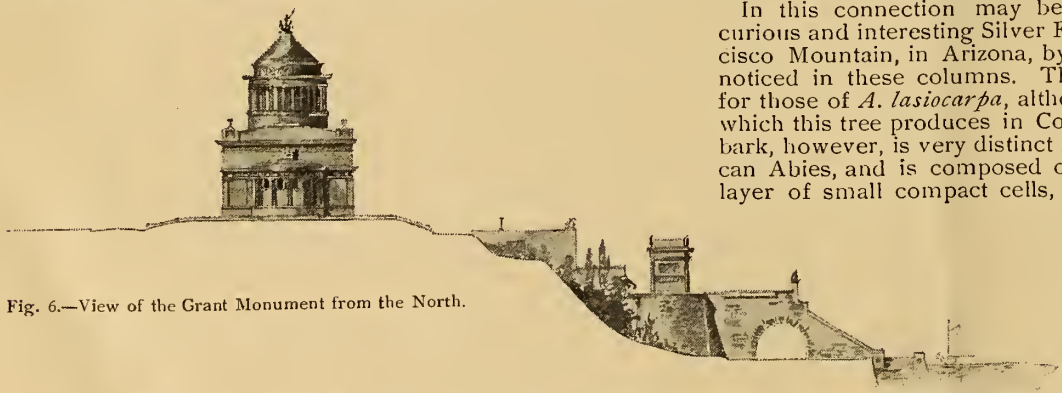

Fig. 6.—View of the Grant Monument from the North.

Plant Notes.

Some Recent Portraits.

In the issue of the *Gardeners' Chronicle* published on the 27th of December there is a figure of the cones of the Colorado Silver Fir, *Abies concolor*, produced on a tree growing in the Knaphill Nursery, Woking, and possibly the first which the Colorado tree has produced in cultivation. Cones described as brown and as purple, both produced at Knaphill, presumedly from different trees, are represented, the tree bearing the last being mentioned as variety *violacea*. The color of the cones, however, is hardly a sufficient fixed character upon which to establish even a variety. In the forests of Colorado green cones and purple cones are produced on trees standing side by side, and undistinguishable except in this one particular. It is not at all an unusual thing to find among conifers individuals of the same species producing cones of different colors. This occurs in the case of the Mountain Hemlock, *Tsuga Pattoniana*, whose cones are sometimes dark purple and sometimes green; and also in the case of *Abies lasiocarpa* (the *A. subalpina* of American botanists), which, on the eastern slopes of the Cascade Mountains, in Washington Territory, produces green and dark purple cones. It is not known even in the case of these species if the same tree produces permanently the same colored cones or whether they are not in some years green and in others purple. The English custom of considering the White Silver Fir of the California Sierras, which we in this country call *Abies concolor*, distinct from the Fir of Colorado, is hardly tenable from a botanical point of view, desirable as it may be in garden nomenclature, and it is certainly not supported by the botanists who have had the opportunity to observe this tree growing from one end to the other of the immense territory it inhabits.

In this connection may be mentioned the exceedingly curious and interesting Silver Fir discovered on the San Francisco Mountain, in Arizona, by Dr. C. Hart Merriam, already noticed in these columns. The leaves might well be taken for those of *A. lasiocarpa*, although much longer than those which this tree produces in Colorado and New Mexico. The bark, however, is very distinct from that of any of our American Abies, and is composed of a thick, corky, compressible layer of small compact cells, the surface of the bark being nearly pure white. This structure of the bark is so unlike that of our other Abies that it would seem to indicate a distinct species, although this cannot be determined until the cones are seen.

There is a charming portrait of the Copper Austrian Briar Rose in *The Garden*, of London, of December 27th, 1890. The Copper Briar is one of those old-fashioned flowers which graced and enlivened our grandmothers' gardens, but which in these days is very rarely seen, in this country at least. It is a native of southern Europe, and was cultivated three centuries ago in England. Mr. George Paul, the well known

English Rose-grower, contributes to *The Garden* the following note with regard to this plant, which we should be glad to see more generally cultivated here:

"It is best grown as a dwarf, though I have standards in my garden which flower freely, but the slender leafage and short time of flowering hardly render them nice-looking objects for the rest of the year. As dwarf bushes they succeed admirably, growing in any good light soil, either on their own roots or worked on Briar or Manetti stocks; indeed, I think the stock gives an additional root power, and so leads to stronger and more vigorously pushed-up shoots, the flowers being produced along the full length of the last year's suckers or shoots. Good suckers are very valuable, and give the finest blooms. The small wood should, on pruning in March, be cut closely into the two-year-old wood, the strong wood be left long, and these shoots be bent over in the shape of a bow, or they may be pegged down parallel with the ground their full length.

"So far this Rose has not given, to my knowledge, any hybrid progeny. It has been tried at Lyons, and Lacharme had it freely planted on the wall upon which he seeded his Roses, no doubt with the hope of the pollen effecting natural hybridization, but no seedling of his which I have seen showed any signs of hybridization. In its native home I believe it seeds freely.

"As a rock plant it is effective, and should have a sunny southern exposure to ripen the wood. In common with other Roses, the riper the wood the better it flowers. In saying that no hybrids had been produced, I do not forget Harrisoni and Persian Yellow, which are probably double forms of this variety, Persian Yellow being probably an introduction as a double form from eastern gardens, as *R. sulphurea* also was."

New or Little Known Plants.

Viburnum molle.

THIS handsome plant is closely related to the common and familiar blue-fruited Viburnum or Arrowwood of the northern states (*Viburnum dentatum*). It is a tall shrub, with stout stems growing sometimes fifteen or eighteen feet high, and slender branchlets, beset when they first appear, like the petioles and flower-cymes, with stellate pubescence. The leaves, which are borne on rather slender petioles, are broadly oval or ovate, conspicuously crenulate-dentate, and softly pubescent, especially on the lower surface. They are often four or five inches long by nearly as much broad. The flowers differ from those of *V. dentatum* in their more prominent calyx-teeth, while the blue fruit is larger than that of that species, more pointed by the persistent style and rather more oily.

*V. molle** grows on some of the islands of Massachusetts (Nantucket, Martha's Vineyard and Naushon) and extends southward to Florida and Texas. It has been cultivated for a number of years in the Arnold Arboretum,† where it is perfectly hardy, and where, like many of the North American Viburnums, it is a valuable and exceedingly ornamental plant, well worth a place in any collection of hardy shrubs. *C. S. S.*

New Orchids.

CYPRIPEDIUM INSIGNE, var. MACFARLANEI, Rolfe, is a beautiful yellow variety, much like the variety *Sanderæ* in color, but quite different in shape. The dorsal sepal is much narrower and with a smaller white area, the petals narrower, but the bract much longer. The plant is in the collection of R. H. Measures, Esq., of Streatham.—*Gardeners' Chronicle*, December 6th, p. 655.

CATTLEYA REX, O'Brien, is described as a beautiful Cattleya, somewhat resembling *C. Dowiana*, var. *Imschootiana*, in the shape and color of the flowers, but with long, thin pseudobulbs, and the leaf about a foot long. It was introduced by Messrs. Linden, L'Horticulture Internationale, Bruxelles. I have not seen it.—*Gardeners' Chronicle*, December 13th, p. 684.

CYPRIPEDIUM × ANTIGONE, Rolfe, is a most elegant hybrid, raised by Mr. Seden in the establishment of Messrs. James Veitch & Sons, of Chelsea, from *C. Lawrenceanum*, fertilized with the pollen of *C. niveum*. It is much like the former in habit, but the flowers are white, variously nerved and veined with light purple, thus more nearly resembling the pollen parent, though tolerably intermediate in shape. The leaves are very handsomely variegated. It received a first-class certificate from the Royal Horticultural Society on November 11th last.—*Gardeners' Chronicle*, December 20th, p. 716; also November 15th, p. 570, and November 22d, p. 602.

CYPRIPEDIUM × DORIS, Rolfe, is a pretty hybrid raised in the collection of N. C. Cookson, Esq., of Wylam-on-Tyne, from *C. venustum* fertilized with the pollen of *C. Stonei*. It has retained largely the characters of the mother plant, the influence of *C. Stonei* being unusually small. A second plant, however, is said to show more of the Stonei character. It received an award of merit from the Royal Horticultural Society on November 11th last.—*Gardeners' Chronicle*, December 20th, p. 716; also November 15th, p. 570, and November 22d, p. 602.

Kew. *R. A. Rolfe.*

Foreign Correspondence.

London Letter.

FERTILIZERS FOR ORCHIDS.—The interesting experiments made by Mr. Moore on his Orchids at Glasnevin were referred to a few weeks ago. I refer to them again for the purpose of showing how similar results to those obtained by Mr. Moore have been arrived at by a grower in the south of England, Mr. Spencer, gardener at Goodrich Court, in Rosshire, who writes: "I gave all our Cypripediums, except *C. niveum* and its allies, a dressing in June of Jensen's fish guano, which they took to amazingly. They have also received several doses of manure water from the stable tank, and they show their appreciation of it by the darker color of the foliage and robustness of health generally. As an example, I may mention *C. Spicerianum*, of which a plant purchased six years ago, when it was in a small sixty pot, is now in a twelve-inch pot and recently carried seventeen flower-scapes, bearing a total of thirty-two blooms, thirteen of the scapes carrying each a pair of flowers, one three flowers, and three one flower each. I think this is a proof of the good that results from feeding well these plants when growing. I also use manure for *Cœlogyne cristata* with good effect. Although I have not ventured yet to directly apply manure to Lælias, Cattleyas and similar Orchids, I see no reason why it should not prove more or less beneficial for them and for all Orchids if applied with discretion. Meanwhile, I take care to keep the atmosphere of the houses impregnated with ammonia by means of frequent dampings down with stable drainings. This must make a difference to all the plants with roots exposed to the air, such as Vandas, Oncidiums, etc. We shall in time, perhaps, get to grow many Orchids as fat as we now grow Cockscombs and Hyacinths."

CHRYSANTHEMUM MRS. BEAL is the best by far of all the white late-flowering varieties, at any rate it is superior to any other at Kew. It makes a nice shapely plant, the flowers are large, particularly elegant in arrangement of florets, and of the purest snow white, without even a suspicion of green in them. If I wanted a large quantity of a particularly pleasing white flower for Christmas decorations I should grow a good many plants of this Chrysanthemum.

MRS. ALPHEUS HARDY is proving something of a failure here as a decorative plant; the flowers are rarely even respectable in form, often they fail to open regularly, and when open they are curious merely. All this, too, notwithstanding the most careful treatment, such as, if given to any other variety, would never fail to produce first-rate plants.

The Official Catalogue of the National Chrysanthemum Society (centenary edition) has lately been issued. It contains a careful, interesting paper on the history of the Chrysanthemum by Mr. Harman Payne; a bibliographical list; select descriptive lists of the best exhibition kinds in each of the ten sections into which Chrysanthemums are now divided; a general alphabetical list with synonymy, and a list of new unvouched varieties. The raiser's name and year of distribution are given with each of the recognized kinds. Altogether the book contains much useful information, and will interest both growers and admirers of the Chrysanthemum. Its price is one shilling, and it is sold by E. W. Allen, 4 Ave Maria Lane, London.

STATICES are among the most useful of winter-flowering plants; they grow and flower freely, they are fog-proof, and the dull winter weather does not appreciably affect them. Then

* *Viburnum molle*, Michaux, "Fl. Bor. Am.," i., 180.—Gray, "Syn. Fl. N. Am.," i., 11.—Watson & Coulter, "Gray's Man. N. States," ed. 6, 218.
V. scabrellum, Chapman, "Fl. S. States," 172.

† There seems to be considerable confusion with regard to the correct determination of *V. molle* in collections. It has been received at the Arboretum from the Parsons Nursery at Flushing as *V. lævigatum*, and also as *V. Nepalense*; and the *V. pubescens* of the Kew Arboretum (No. 1104) is not Pursh's plant of that name, but *V. molle*.

their blooms remain fresh so long that some people even grumble at them on that account. Now, when all the usual winter flowers are either destroyed or damaged by bad weather, the Statices are conspicuous for the bright blue, purple and white of their flowers. I fancy these plants have gone out of fashion; at any rate, one sees and hears little about them; and yet they are first-class greenhouse plants, which with a little management may be had in bloom not only in December, but almost the whole year through.

The Weather.—The effect of the dark, foggy, cold weather of the last three weeks has caused the destruction of many herbaceous in-door plants, of almost all flowers, and much work by gas-light all the day through. It appears as though gardening in winter will soon be practically impossible in the vicinity of London.

Apples.—The scarcity of English apples this Christmas has enabled dealers in American apples to "make hay." Thousands of barrels of American kinds found ready and remunerative sale in London last week; for instance, Newtown Pippins sold readily at forty-two shillings a barrel, while the poorest samples fetched twenty-four shillings a barrel wholesale.

Onions.—The finest samples of English onions that I have seen were exhibited lately at a meeting of the Royal Horticul-

Fig. 8.—Viburnum molle.—See page 29.

harm to even sturdy-leaved, hard-wooded plants. I have never seen anything so disheartening as the winter-flowering Begonias, Acanthads, Bouvardias, Salvias, Poinsettias, Reinwardtias, Camellias and Azaleas are in London gardens now. Some of these plants have lost every leaf, and the flowers have withered before opening; others are blotched and disfigured as though they had been frozen. Orchid-flowers have faded almost as soon as they opened, while some have dropped when the buds were quite small. At Kew we have suffered very much, but in the nurseries at Chelsea and other places nearer the city the damage is even greater than here. Plants which have hitherto resisted the poison of the fogs have been terribly damaged by the continued absence of anything approaching sunlight. Day after day we have been compelled to

tural Society by Mr. Deverill, of Banbury, in Oxfordshire, the raiser of some first-rate sorts. "Deverill's Pedigree Onions," as he calls them, are remarkable for their size, firmness and flavor. Bulbs weighing two pounds each are easily grown from Deverill's seeds on good rich loam. One variety, called "Ailsa Craig," is the largest, heaviest and handsomest onion ever raised in England. The flesh is white, very mild in flavor; the bulb comes quickly to maturity, is a good keeper and weighs from two to three pounds. Mr. Deverill exhibited a bushel or so of this variety, and the bulbs, of a pale straw color, looked like large turnips. The cultural directions for obtaining these fine results are given by Mr. Deverill as follows:

"The soil is a heavy blackish loam, resting on red clay, and it receives a tremendous dressing of stable manure in the

month of October, and, if the weather is dry, a good coat of salt; the ground is then trenched two feet deep and left until the spring, when a top dressing of soot is applied. In March or April the ground is raked and made ready to receive the Onions, the seed of which was sown the last week in February, in boxes, then hardened off, and planted the first week in May, in drills eighteen inches apart, seven inches being allowed from plant to plant. There are two rows of Onions, then a path two feet wide and two rows of Onions again, and so on. The beds are top dressed with well spent manure, and several doses of soot are sown broadcast during the season; the beds being well watered in dry weather, thoroughly soaked between the rows, the two-foot path between each two drills being very convenient for the purpose.

"This method of cultivation produced the finest bed of Onions ever grown in the United Kingdom. Hundreds of bulbs could be picked weighing from a pound to a pound and a half each, and scores from two pounds to two and a half pounds. A dozen bulbs scaled twenty-eight and a half pounds, and six bulbs fifteen and three-fourths pounds."

London. *W. Watson.*

Cultural Department.

Notes on Some Hardy Wild Roses.—III.

THE pretty little Burnet or Scotch Rose, the type of which is known to botanists as *Rosa spinosissima* (or *R. pimpinellifolia*), has been so long and so much cultivated that innumerable forms and variations of it are now grown. It appears to hybridize naturally and easily with a number of species of Roses belonging to other groups, so that many of the forms classed under *R. spinosissima* in catalogues are in reality mixtures with other species. The erect, though dwarf, and much branched habit of the plant; the very numerous prickles of unequal length with which its branches are armed, and the generally small leaflets, serve as a rule to distinguish these Roses from any others in cultivation. As it grows wild in its native habitats in Europe and Asia, the Burnet Rose seldom exceeds a foot or a foot and a half in height, and its rather small flowers are borne singly, and are either white or pink in color. In cultivation the plants attain a height of from two to three feet. While many double flowered forms have been developed, those with single blossoms, of varying sizes and shades of color, are none the less beautiful. One of the prettiest of these in the Arboretum has flowers of a very delicate pinkish white color, which expand from two to two and a half inches across. The flowers of these Roses appear early in the season, and they continue to bloom for two or three weeks, and are followed in August and September by large, solitary, almost globular, and very firm hips, conspicuous by their purplish black, or sometimes deep red, color, which also extends down the somewhat thick and fleshy fruit-stalks. As the foliage of this species is good and persists late, it is often useful for massing in clumps in shrubberies.

Any peculiar form of this Rose must necessarily be propagated by cuttings or layers or other modes of division; seeds cannot be depended on to come true to the character desired.

Although the single-flowered Yellow Eglantine Rose (*Rosa lutea*) has been in cultivation for centuries, it still appears to be one of the rarest of wild Roses in northern American gardens. This may be partly accounted for by the fact that it does not seem sufficiently hardy and enduring under ordinary circumstances to make it popular. Nevertheless it will do well in sheltered situations, and its large single yellow flowers are quite as interesting and beautiful as those of any double yellow Rose we ordinarily meet with. Besides the deep color of this Rose there are the variations, which are of a deep coppery, lurid red or scarlet hue on the upper side of the petals and yellowish beneath, giving to them an unusual or unique place in the genus. Although the flowers are less enduring than those of the double Yellow Harrison, or the handsome, but troublesome and generally unsatisfactory, Persian Yellow, they are quite as attractive as either of these double Roses when growing side by side with them in the garden, and are well worth a little space in any collection. While the little Scotch Rose is generally noted for its more or less rounded or compact habit under cultivation, the Yellow Eglantine is disposed to become straggling, and requires to be carefully trained, and judiciously, but not too severely, pruned. Plenty of warmth and sunlight and moisture are essentials to its successful cultivation. As there is little likelihood of confusing the foliage and flowers of this with other species, it may sometimes be budded or grafted to advantage upon other kinds suitable as stocks.

The Sweet Briar Rose (*Rosa rubiginosa*), or Eglantine, as it is also sometimes called, is one of the few examples where a single or primitive Rose has taken and held a place in gardens, although its popularity has, no doubt, been partly owing to the peculiar sweet-scented and agreeable fragrance given off by the foliage when rubbed or bruised. This odor originates in the rusty-colored glands which cover the leaves and buds and which suggested the name of the Rusty-leaved Rose for this plant. It is one of those species in which long cultivation and selection have produced many modifications and well established variations. Around it may be grouped a number of others generally described as distinct, but which are hardly separable as species from the horticulturist's point of view. Some of them are deficient in the true Sweet Briar fragrance, and relationship to the Dog Rose (*R. canina*) and other species may sometimes be indicated. *R. micrantha* hardly differs from the Sweet Briar except in the size of its flowers and fruit; and others closely allied go under such names as *R. graveolens*, *R. Belgradensis*, *R. Caballicensis* and *R. agrestis*. The flowers of some of these are white, others are rose colored; and they are generally, although not always, followed by an abundance of bright red fruit, which remains conspicuous throughout most of the winter. *R. rubiginosa*, var. *echinocarpa*, as it grows in the Arboretum is a very robust plant with flowers of a bright rose color, which expand over two and a half inches across, and some of whose stamens become transformed into petals, showing the tendency toward the double forms which have already been evolved from this species. The Sweet Briar has escaped from gardens and become naturalized in many of the older settled localities in America, from Nova Scotia and the St. Lawrence Valley to the southern states. Gardeners have occasionally found it of value as a stock upon which to bud some kinds of our garden Roses.

The Sweet Briar appears to be, more than any other species, subject to large mossy-looking deformations or excrescences on its stems and branches. These are caused by a gall-making insect (*Rhodites rosæ*), of which a considerable number, occupying separate cells, are to be found in each mossy cluster. They naturally interfere somewhat with the free growth of the plant, and where they occur in such abundance as to be annoying the galls may be cut from the bushes in winter and burned, for the insects do not leave them until the following spring or early summer.

The Dog Rose (*R. canina*) has also become spontaneous in some parts of this country. There are a large number of plants, mostly found in Europe, to which varietal or specific names have been given, but which bear more or less affinity to the typical Dog Rose. The principal use which has been found for this Rose is as a stock upon which to bud or graft many of our finest garden kinds, as thus treated they give better satisfaction than when grown on their own roots or upon other stocks.

The Red-leaved Rose (*R. rubrifolia*, a name which Professor Crépin now replaces by the older *R. ferruginea*), a native of some parts of Europe, is perhaps more curious and odd than really beautiful, the dark pinkish or purplish red leaves contrasting strongly with the foliage of other species. The plant grows five or six feet in height, and produces numerous rather small flowers, which are hardly distinguishable from the leaves in color. When not too freely used this Rose may be so planted among other green-foliaged plants in shrubberies that it will give a pleasing effect and variety. It is still uncommon in this country; but it will be found perfectly hardy in exposed situations, even where the temperature falls to twenty or thirty degrees below zero.

Arnold Arboretum. *J. G. Jack.*

Rose Notes.

AUTUMN BLOOMING VARIETIES.—No variety surpasses the old Souvenir de Malmaison as an autumn bloomer. In many of the northern states, where our winters are a constant succession of hard freezing and complete thawing, this and many other out-door Roses are so crippled by the sudden changes as to have little chance to show us their best points. They may often be seen in really fine form in localities of extreme cold, but this is where they are not subject to these trying thaws; in both situations, however, a judicious winter protection, which allows a good circulation of air about the plant, will usually be found of great benefit.

In the milder climate of England and in the more favored areas of our own country, especially in the Ohio Valley and southward, the Malmaison, with Sombreul for a lovely companion, are beautiful beyond description. Cave Hill Cemetery, at Louisville, is a garden of Roses, and it is seldom seen to greater

advantage than when these two fine varieties, with Hermosa for a modest third, are in the full flush of their autumn bloom. Not a stray Rose here and there, but Roses in the greatest profusion and on every side.

Of the hybrid Teas, La France is often noticeably beautiful in the autumn; but this entire section of the Rose family, notwithstanding that it contains some of our most delightful varieties, is rendered almost unfit for out-door planting in the north, owing to its susceptibility to the ravages of that dreaded disease, Black Spot. I cannot refrain from calling attention to a near and lovely relation of La France, the Viscountess Folkestone. One of the late Mr. Bennett's pedigree seedlings, it is not surpassed in beauty by any Rose extant. There are many locations through our middle states where it winters finely, and seems a Rose absolutely without fault. The flower is of grand size and the most finished form; the texture is like satin; the color is white, shading to a soft flesh tint at the base of the petals, giving it a bright illumined appearance.

Madame Willermoz (Tea).—This beautiful Rose was introduced by Lacharme in 1845, but has become badly confused in our country with Madame Denis, which it much resembles. Wherever the Tea Rose flourishes Madame Willermoz is seen in perfection, a beautiful flesh-white flower of rounded, symmetrical form, set in large leathery foliage of great beauty. Lettie Coles, an exquisite sport from Madame Willermoz, is very popular in our country, as it deserves to be; it is identical with the latter save in color, which is soft China pink of varying shades.

Dr. Grill (Tea).—This is a comparatively new Rose (1888, I believe), and must be classed among tender Teas until a more complete trial out-of-doors shall entitle it to a better position. For the conservatory it is a most beautiful variety, the color being coppery yellow, with rosy reverse shadings. The outer petals are large and shell-shaped, and enclose a full double centre of short petals of very brilliant color. It is a strong, free grower.

Richmond, Ind. *E. G. Hill.*

The Cultivation of Native Orchids.

THE hardy native Orchids, as a class, are not as easily grown as most other wild flowers. Almost all of them grow in situations and conditions quite unlike those offered by an ordinary garden. Many of them, in fact the majority, are bog-plants, and when transplanted into an unmodified garden soil, even though they may flower for one season, do not acquire strength for a second year and soon die. Those which do not grow on bogs often grow where the conditions are similar to those of a bog, and some of these will flourish in soil which, though not wet, never becomes perfectly dry.

The Cypripediums, or Lady Slippers, are perhaps the most desirable of the family, and, except *C. acaule*, are the easiest to manage. If not planted on a bog they need a specially prepared soil, and to give them this, good drainage, shade and plenty of peat or leaf-mould are necessary. Let it be well and deeply mixed into the soil. For *C. spectabile*, which is the queen of Lady Slippers, and also for the little Ram's Head Lady Slipper (*C. arietinum*), it is quite important that the roots do not come in contact with a gravelly or sandy soil, as this seems not to agree with them. Therefore, when planting in such soils, in addition to the peat already mixed in, enough of the pure peat should be used to surround the roots. The two yellow Cypripediums—*C. pubescens* and *C. parviflorum*—are the least particular about their location; but even they delight in the leaf-mould, and will do enough better to pay for applying it. There seems to be considerable difficulty in establishing *C. acaule* in cultivation, though the soil selected for it may be almost exactly like that in which it is found growing wild. One reason for this may be that the foliage is sensitive to gravel or sand, and, when planted without a mulch, the heavy rains spatter the soil over its leaves, which seems to poison them. No doubt this is one reason why a good many other plants do not prosper in cultivation which might do so if this were prevented. It is well known to farmers and gardeners that this is very injurious to the leaves of Beans, and for this reason they never hoe them when their foliage is wet. In very light sandy soils heavy rains alone so injure the foliage of some varieties of bush Beans that they cannot be successfully grown, and in such soils pole or running varieties are often preferred, because their foliage is held up above the reach of the soil even in the hardest showers. Naturally most plants have sufficient mulch around them to prevent this. The buds and ground about them covered with leaves, grass or moss prevent the soil from getting onto the foliage. *C. acaule* often grows on bogs, yet is more frequently found on higher ground, especially in Pine-woods. Mr. Edward Gillett has had the best success in growing it when mulched with Pine-needles. This would seem to be a natural covering, and if planted in the fall and the buds covered by an inch or more of this mulch, they would readily penetrate it in spring, and when unfolding after, no particles of the soil underneath could reach the leaves.

There are other Orchids, seldom seen except in bogs, which may be treated like the Cypripediums on upland soils and made to prosper. Such Habenarias as *H. tridentata*, *H. hyperborea*, *H. dilatata*, *H. blephariglottis*, *H. lacera*, *H. psycodes* and *H. fimbriata* have flourished on higher ground than their natural habitat in soils which were prepared for them. Artificial bogs seem the most natural place for them in cultivation, but it is not necessary to discard them entirely if no bog is to be had.

Calopogon pulchellus, a natural bog plant, usually growing with *Pogonia ophioglossoides*, is frequently found on upland in wet or moist sand, and may be grown in garden soil, treated like the Habenarias, but *Pogonia ophioglossoides* and Arethusa do not flourish except in bogs. They may be grown in pots, but require the same conditions as on a bog.

The delicate and charming little Calypso, planted in moist, dark soil in autumn, and protected during winter with a few leaves, will come out thrifty in the spring and bear perfect flowers. After the flowering season is past, however, during its dormant season, which is from early June until the middle of October, comes the most critical time for this plant. The cool and dark Cedar-swamps, where it is found in New England, afford during the hot summer months just such surroundings as the bulbs need, surroundings not easily copied in a garden. But I believe if the right mulch is applied, one which will protect it from the heat and keep it always moist, and then removed at the time the fall growth begins, even this may be grown and flowered more than one season in a cool nook of the garden.

Aplectrum hiemale (Putty-root) is one of the easiest Orchids to transplant. Though by no means common, it can be relied on to live if fairly treated. A fine chip dirt, used as a heavy mulch over the bulbs, in moist, well-drained soil, is at once the best food and the surest protection for this plant.

The Habenarias, such as *H. bracteata*, *H. Hookeri* and *H. orbiculata*, which grow on drier soil in rich woods, require less care in their treatment. They seem to take readily to cultivation if well developed roots are used in setting. These species when taken up in flower do not mature their buds in a new place so well as the Cypripediums.

One of the hardest Orchids to establish in cultivation is the common *Orchis spectabilis*. It must have a moist, shady place, with perfect drainage. Leaf mould and sand is the best mixture for it. Only the strongest roots should be used in setting, and a mulch of something like fine leaves over the roots will be useful in protecting them from the severe cold and to keep the soil from the leaves in spring.

Southwick, Mass. *F. H. Horsford.*

Oxalis floribunda.

THE genus Oxalis has almost disappeared from the catalogues. Why this should be so is hard to say, for many of the species are highly ornamental, of neat, compact growth and easy culture.

O. floribunda is one of the group having thick, fibrous roots and a stout fleshy body which begins as a round tuber and grows upward into a short succulent trunk, generally with a few tuberous, almost globular, branches at the top when the plant gets old. I consider this species a very desirable one for either winter or summer flowering, and of the innumerable seedlings which spring up around the old plants have made a selection of several very distinct and pretty varieties. The typical form is red of a shade inclining to rose; and this was the first which I obtained many years ago. My original plant had blossoms with narrow petals, overlapping hardly any, if at all. Ninety-nine per cent. of accidental seedlings will have that undesirable form which I have heard called "mill-wheely," but I found one about five years ago whose petals overlapped almost to the very circumference, making a beautiful round blossom about the size of a silver dime.

I have, of course, kept this variety, and have sown its seed whenever I could get it, which is a matter of chance, for the seed-vessel of Oxalis opens with a snap when ripe, scattering the seed far and near. I have thus obtained a beautiful white flower as round and perfect as the parent. When the sun shines this kind is as bright and pretty as can be imagined. Another seedling is bright lilac; a very distinct kind, not so perfect in shape as the

others, but somewhat larger and well worth growing. Still another is a bright pink, with wavy edges; I consider this one the best of all.

I have not yet succeeded in getting a very good two-colored sort, though I have a variety whose flowers are white with a pink tip to each petal, and another with rose-centered white blossoms. These are both too narrow in petal to be perfectly satisfactory. A pink one, whose color is altogether different from the pink one mentioned above, is also not quite to my liking; still I keep them, hoping to get, some time, good shape in connection with these colors.

I am best pleased, however, with a hybrid raised from *O. floribunda* type fertilized by *O. articulata*, a species of similar style of growth which flowers in August, bearing perfectly circular blossoms of a light mauve color. This hybrid, which is, as far as I know, the only one in existence, has the ever-blooming habit of the pistillate parent and its comparatively small flowers. These are of a deep shade of red, with a distinct bluish tinge. The shape is equal to that of the staminate parent, whose influence is also apparent in the foliage.

If the varieties of *O. floribunda* are grown continually in a pot they will blossom twelve months in the year, but in a few years the roots will be so crowded that the flowers will fall off in size, and the plant will probably become infested with red spider. I prefer, therefore, to plant them out in the garden in May, where they will be objects of beauty on every sunny day, growing finer and finer as the season progresses, getting too large before winter to be covered by a half-bushel measure. At the end of October they should be dug up, the foliage and flowers sheared off close to the stump. As many of the lumpish branches as are wanted for winter blooming should be broken off and potted singly in five-inch pots. They will strike root and develop leaves and flowers in a very short time, and, either on brackets or hanging baskets, will give their owner great pleasure until the following May, when they should be planted out.

If it is desired to keep any of the plants dormant through the winter they may be carried through successfully by packing them in damp moss or earth.

Canton, Mass. *W. E. Endicott.*

Cypripedium Fairieanum.

Cypripedium Fairieanum may be reckoned among the dwarf-growing kinds, its bright green, oblong-acute leaves not being more than three to five inches long, and about an inch broad in the widest portion, while the pale green, slender hairy scapes seldom exceed four to six inches in height and bear a single flower. The latter measures about three inches from the tip of the upper sepal to the point of the slipper, so that it cannot be considered a large flower. But what it lacks in size is made up for in beauty, and this fact is universally acknowledged. The upper sepal is almost oval in outline, with a slightly ciliate wavy margin, the upper portion of which is turned in to the front on each side. The ground color is creamy white, tinged with pale yellowish green at the base, and longitudinally traversed by rich purple stripes, which form a beautiful net-work on each side, giving the plant one of its most charming features. The lower sepal is much smaller, pale green and veined with dark purple. Perhaps one of the best descriptions on record of the petals is that they resemble the horns of a buffalo, being first bent down and then curved upward. They are oblong-acute, and have the wavy margins densely fringed with blackish shining hairs. The surface is pale yellowish white, striped lengthwise with thin purplish lines, which, however, form bands, owing to contiguity, near the margins on the apical portion. The small, neat-looking pouch is pale green washed with brown, and has a few conspicuous dark purple veins, which give off smaller ones on each side, while the creamy white, inflexed basal lobes form a strong relief to the several purple spots with which they are decorated.

Like *C. superbiens*, the subject of this note is remarkable inasmuch as its native country is unknown, and is merely conjectural, notwithstanding that it is stated in the *Flore des Serres* for 1857 that *C. Fairieanum* was received from Bhotan. But it has never been found in that region, and all the plants in cultivation have been propagated from the first few plants which reached Europe. This event occurred in 1857, or perhaps earlier, but the first notice of *C. Fairieanum* was by Sir W. J. Hooker, who received flowers from Mr. Reid, of Burnham, Somerset, and Mr. Parker, of Holloway, and had a figure prepared for the *Botanical Magazine* (*t.* 5024). The specific name commemorates Mr. Fairie, of Liverpool, who exhibited the plant at a meeting of the Royal Horticultural Society in 1857, when Dr. Lindley named it after him. It has been stated also that *C. Fairieanum* was supposed to have been sold at the London auction rooms with a miscellaneous collection of Orchids imported from Assam, and it was in this way introduced to cultivation. It is naturally very scarce, and will no doubt require many years of careful propagation to render it in any way a common plant.

It will be found best to grow this species in a house not too warm nor too cold—in fact, what is technically termed "intermediate." The temperature in winter may vary from fifty-five to sixty degrees Fahr., and about ten degrees more in the summer months, gradually raising by a degree or two until the warmest period is reached, and again gradually decreasing as the cold winter months approach. Small, well drained pans which can be suspended near the glass appear to be the most fitting receptacles in which to grow *C. Fairieanum*, and the compost may consist of rich, rough peat and fresh sphagnum. As to watering and ventilation, the gardener must, of course, exercise his own judgment in these matters, giving greater or less supplies of water according as the plant shows an inclination to grow vigorously or to rest, and air to strengthen the growths when there is no danger of creating any great or sudden fall in the temperature by cold and piercing draughts.

Isleworth, London. *John Weathers.*

The Mignonette Disease.

IN a large house devoted almost entirely to the growth of Mignonette I lately observed thousands of plants struggling to come into bloom, but lamentably failing because of a fungous parasite which was preying upon them. The whole expanse of Mignonette had a sickly appearance, for the lower leaves were either entirely dead or badly spotted. The Fungus sends its fine threads through the substance of the stem and leaf and shortly they come to the surface in certain places, the green of the normal leaf disappears and soon upon the white spots dark specks are produced. These are due to the formation of multitudes of spores, and as they are carried away by the wind when dry, or by the water when wet, the disease is spread from plant to plant.

Last year the section of Vegetable Pathology of the Department of Agriculture at Washington had this disease under investigation, and the results have recently been published in its annual report with a colored page plate. Therefore, for the Mignonette-growers now suffering from this trouble, some of the facts of that investigation, together with the remedies that proved effective, are here given in brief. The Fungus doing the mischief has been known for twenty years or more, and was named *Cercospora resedæ* in 1870. The Cercosporas are, many of them, serious enemies to growing crops, but, as a rule, are within the reach of remedies when taken in season. The Fungus itself is entirely microscopic, and only becomes noticeable when it has killed a portion of the tissue it is feeding upon. It, therefore, is not reasonable to hope that any substance can be applied that will restore the lifeless spots of a leaf to health. The chief point is to check the further spread of the disease and permit the dead portions to be superseded by new healthy ones. The spores, for example, are all borne upon short stalks that project from the surface of the diseased parts, and are therefore within easy reach of a fungicide. In like manner these spores must fall and germinate upon the surface of the plant; therefore, the coating over of the surface of diseased and healthy plants at the same time kills the spores before they have become desseminated and destroys others that may have reached the healthy plants and are possibly beginning to germinate and penetrate the substance.

It was found that while the ammoniacal solution of carbonate of copper checked the spread of the disease, the Bordeaux mixture was the most successful. This made in the ordinary way and sprayed upon the bed liberally about once per week saved the plants when they were not so far gone as to appear worthless at the outset.

Any Mignonette-grower whose plants are suffering from the disease can test the efficacy of the Bordeaux mixture by omitting to spray certain portions of his beds, and in that way be an experimenter for himself.

Rutgers College. *Byron D. Halsted.*

Acacia pubescens.—This is one of the best of a large genus, and should be grown wherever space can be afforded. It is now in flower at Wellesley College, and in the gardens of Mr. H. H. Hunnewell there are two very large specimens, measuring nearly, if not quite, ten feet in diameter, which will make a magnificent display in about a month, with their long,

drooping, panicled branchlets covered with small, globular, sulphur colored flowers, filling the air with a delicious fragrance. Some Acacias are difficult to propagate by cuttings, and I believe this is one of them. They are, however, easily raised from seed, and seedlings invariably make the best plants. Acacias make roots rapidly, and quickly fill whatever space is allotted to them. When they are finally placed in tubs as large as can be conveniently handled, frequent top-dressings of rich soil will keep them in good condition for many years. They may be kept in symmetrical form by a little yearly pruning after the flowering season, which is the time for cutting out crowding branches.

Wellesley, Mass. *H. G.*

Clematis paniculata.—In urging the advantage of grafting as a means of propagating this plant it ought to be said that the stock used is merely a vehicle to carry the scion during the infancy of the plant. When grafted plants are set out care should always be taken to place the point of union beneath the soil, and an examination at the end of the first season's growth will soon show that *Clematis paniculata* has thrown out a quantity of its thick, thong-like roots, and that the foreign root is already superseded and speedily becomes of little or no use to the plant. Mr. Hatfield says truly that *C. paniculata* varies considerably when raised from seed, and I have seen seedling forms with a distinct variegation or venation of the foliage, the centre of the leaves being distinctly marked with blotches of a lighter green. And yet it is difficult to imagine anything more beautiful than the typical plant as a perfectly hardy climber.

South Lancaster, Mass. *E. O. Orpet.*

The Forest.

Forest-policy Abroad.—III.

In France, which stands with Germany at the head of the nations as regards thoroughness of forest-policy, the large extent of Government and other public forests is in excellent condition. The training of French foresters, and, to some extent, the treatment of French forests, differ widely from those which distinguish Prussia, as indeed the genius of the people would naturally lead us to expect. That this training extends over two years instead of the six to eight spent by the Prussian candidates, cannot but make the task of national forest-administration seem lighter, especially in view of the admirable, and very often the wonderful, results which the French forest-officers have achieved. Perhaps their most brilliant work has been accomplished in the correction of the torrents in the Alps, Pyrenees and Cevennes, in the course of which over 350,000 acres have been rewooded under difficulties which seem almost insurmountable. Of the total cost to the French Government, some 50,000,000 of francs, about one-half was consumed in engineering works whose direct object was to make the replanting of the drainage areas of torrents possible. "The forest thus restored to its natural place is alone able," says an eminent French authority, "to maintain the good, but precarious, results of the works of correction in the waterways themselves." The disappearance of this forest, in the first place, may be traced, in most cases, directly to mountain pasturage, and the whole story of reboisement in France is full of the deepest interest in comparison with the past history and probable future of our mountain forests.

Perhaps the closest analogy to our own conditions in the magnitude of the area to be treated, the difficulties presented by the character of the country and the prevalence of fire, and the nature of the opposition which it encountered, is to be found in the forest-administration of India, and that in spite of the tropical climate with which it has to deal. The history of the movement is comparatively fresh, and the fact that many problems remain as yet unsolved will scarcely detract from the interest and sympathy with which we may be led to regard it.

Systematic forest-management was begun in India about thirty-five years ago, under difficulties not unlike those which confront us now. An insufficient or a wrong conception of the interests involved, the personal bias of lumbermen, the alternating support and opposition of the men in power, were the chief obstacles with which it had to contend; and against them were pitted the splendid perseverance and magnificent administrative powers of one man. The victory was brilliant, conclusive and lasting, and India has to thank Sir Dietrich Brandis for benefits whose value will go on increasing from age to age.

"History has proved," says Dr. Schlich, "that the preservation of an appropriate percentage of the area as forests cannot be left to private enterprise in India, so that forest-conservancy in that country has for some time past been regarded as a duty of the state. Of the total area of Government forests, which may perhaps amount to some 70,000,000 of acres, 55,000,000 have been brought under the control of the Forest-Department. Of this area 33,000,000 are so-called reserved state forests—that is to say, areas which, under the existing forest-law, have been set aside as permanent forest-estates—while the remaining 22,000,000 are either protected or so-called unclassed state forests. These areas together comprise about eleven per cent. of the total area of the provinces in which they are situated. Rather more than half the area, or about six per cent., are strictly preserved and systematically managed forests."

The formation of these reserved state forests was the first step in systematic forest-management, and it was carried out along lines which are typical. The forest-areas were first selected, following standards which cannot be enumerated here, then surveyed and demarcated on the ground, and finally established as reserved state forests by an act which provided, first, for the presentation, within a certain time, of all claims against the state forests as demarcated; secondly, for their hearing and definite settlement; thirdly, that no prescriptive rights could accrue in reserved state forests after their declaration as such under the act; and, fourthly, for the special treatment of forest-offenses.

These forests have been gradually brought under simple, but systematic, methods of management, which aim at effective protection, an efficient system of regeneration and cheap transportation, the whole under well considered and methodical working plans. The forest-staff charged with carrying these plans into effect draws its controlling officers from England, but the executive and protective work is done by natives, since they alone are equal to the physical labor in so warm a climate. The results of this enlightened policy are conspicuous, not only in the great fact that the forests yield, and will permanently yield, the supply of timber and forest-produce which the population requires, but also in the beginning which has been made toward regulating the water-supply in the mountains, and in the increasing capital value and annual net revenue of the state forests. This last has reached the verge of half a million sterling, and it is believed by the men best fitted to judge, that the forest-revenue will increase at least four times during the next quarter of a century.

There are two other facts resulting from the forest-policy of India which are of special significance to us as citizens of a country where any interference by the Government with private rights would be so vigorously resented, and where private enterprise must consequently play so conspicuous a part: First, a body of efficient and experienced officers of all grades has gradually been formed in the state forests whose services are available for the management of private forests, and of communal forests when the time shall come to form them; secondly, the example set by the well-managed state forests and the steadily increasing revenue which they yield have induced native and other forest-proprietors to imitate the state. The trained foresters, without whom so laudable a purpose must fail, are at hand, and the whole situation argues most favorably for the future prosperity of the country.

It has been impossible to do more than glance at the chief points of forest-policy in a few of the many lands which teem with interest in this respect. I would gladly have called attention to Austria, where an excellent forest-service upholds the general principles which we have seen exemplified elsewhere, and to Italy, where the sale of government forests, forced on the state by the pressure of financial necessity, is beginning to bear evil fruit. A circle of lands around the Mediterranean might have been cited to instance the calamitous results of deforestation, and from some of them still further proof might have been adduced to show at what a cost such errors must be repaired. But the countries which have distanced us on the road toward a rational forest-policy might better have claimed our attention.

Without confining ourselves to Europe, where we might have stopped to glance at Sweden, whose Government has recognized its obligations as a forest-proprietor, and where even Russia could have shown us the beginnings of conservative forestry, we might have found in Japan an organized forest-administration, with a forest-school at Tokio. Cape Colony has an efficient forest-staff, thanks to which the Government is in receipt of a net revenue from the management of its forests, and Natal has recently engaged a German forest-officer to take charge of its interests in that line. Victoria has a reserved state forest, and New South Wales, Queensland and Tasmania have followed her lead in the appointment of

forest-officers. New Zealand has taken the examples of the colonies of eastern Australia, and Ceylon, Java, the Fiji Islands and others have made steps in the right direction.

Dr. Schlich's statement of the destructive tendencies of private forest-ownership in India might with equal truth have been made as a general proposition. It is the salient fact which the history of the forests of the earth seems to teach; but nowhere have the proofs of its truth taken such gigantic proportions as in the United States to-day. Even in Germany, where the state has done its utmost to surround them with every possible safeguard, the wood-lands of private proprietors are steadily decreasing both in area and in quality. A second great fact, which is of equal and immediate significance to us in America, is that the countries which have been successful in forest-preservation have been so along the lines of forest-management. The first and most evident function of the forest is to produce wood, and no scheme which leaves out of account the imperative and legitimate demand for forest-produce is likely to meet with the support of a people as practical as our own. The forests which are most profitably used are the forests which are best preserved. These truths have never had the currency with us which their importance has deserved, and as a result we have been hastening along a road whose end is painfully apparent. We are surrounded by the calamitous results of the course that we are now pursuing. In fact, it seems as though there were almost no civilized or semi-civilized country in either hemisphere which cannot stand to us as an example or a warning. To this great truth they bear witness with united voice: The care of the forests is the duty of the nation.

New York. *Gifford Pinchot.*

Correspondence.

The Owl and the Sparrow.

To the Editor of GARDEN AND FOREST:

Sir.—GARDEN AND FOREST for December 24th, 1890, contains a letter from Charles Naudin, in which he recommends the introduction into the United States of the European Pigmy Owl, or *Chevêche*, the scientific name of which he gives as "*Stryx passerina*, Linnæus." *Strix passerina* of Linnæus (1758) is the *Glaucidium passerinum* of modern authors, while *Strix passerina* of Gmelin (1776) is at present known as *Carine noctua*.

It is not quite clear which species is really meant, but this matters little so far as the proposed scheme of introduction is concerned, both species inhabiting France, and both feeding largely on small birds, particularly such species as make their nests in holes or cavities. It is not likely that the introduction of either of these small owls into the United States would go far toward reducing the numbers of English sparrows; while, on the other hand, the experiment might be fraught with most unfortunate results.

Our little wrens, bluebirds, titmice, and other species which nest in crevices, holes and artificial houses erected for their use in the vicinity of dwellings, would be destroyed as well as the sparrows.

One of our native owls—namely, the little Screech Owl (*Megascops asio*)—has taken up its residence in many cities and large towns infested with sparrows, and has learned to feed upon these pests in great numbers. Its presence may be encouraged without incurring the risks attendant upon the introduction of exotic species. The importation of exotic birds, with a view of setting them at liberty in our own land, should always be regarded with suspicion, as likely to be followed by disastrous results.

Department of Agriculture, Washington, D. C. *C. Hart Merriam.*

The Madroña in Winter.

To the Editor of GARDEN AND FOREST:

Sir.—Among the broad-leaved evergreen trees of the Pacific coast none are handsomer perhaps than the Madroña (see illustration in GARDEN AND FOREST, iii. 515), and it is peculiarly bright and beautiful here during the winter months. Unlike the Ash, the Alder and the Maple, the Madroña is found in the driest and sunniest localities upon the hill-sides as well as in the denser forests along the foot-hill streams. Even on these drier ridges, where the forest is more open, the Madroña is quite abundant, and always forms a charming feature of the landscape. Especially is this the case in the winter, when the bright green of its leaves are in pleasant contrast with the sombre hues of the huge conifers of this region, or with its leafless neighbors among the deciduous trees. But in the denser forests of mingled evergreen and deciduous trees along the foot-hill streams the Madroña is most abundant, and here in the dim light, where the rich and varied foliage of evergreen shrubbery hangs above a living carpet of moss and trailing plants, its presence wonderfully increases the charm of it all. Its large, handsome leaves are of the glossiest green. Its great, almost naked, branches are clad in the daintiest and closest fitting bark, soft, velvety, smooth and conspicuously clean, a garment scarcely thicker than writing paper, and ranging through a variety of colors, from almost pure white through the most beautiful and delicate shades and tints which I can only describe as drab to pea-green, yellow-green and buff to cinnamon and red.

Here the Madroña, the type of all that is loveliest in sylvan life, is so abundant, that with its leafy wealth on every hand, we are made to believe, even in the winter months, that by some magic we have been transported to some semi-tropical land. *Berberis Aquifolium*, the handsome Holly-leaved Mahonia, with us called Oregon Grape; *B. nervosa*, the low Oregon Grape, the prettiest little plant, perhaps, of its genus; *Micromeria Douglassii*, the sweet-scented yerba buena; *Linnea borealis*, the pretty little Twin-flower, known and loved the world around; *Whipplea modesta;* Synthyris; *Gaultheria Shallon*, the Salal; *Chimapila umbellata*, the Prince's Pine, and a host of other evergreen, shrubby and trailing plants, lend the charm of their bright foliage to this deception.

Wimer, Ore. *E. W. Hammond.*

Periodical Literature.

In the *Popular Science Monthly* for January we find a biographical sketch of Dr. Elisha Mitchell, who deserves to be more widely known to American lovers of nature than we believe to be the case. Dr. Mitchell was born in Connecticut in the year 1793, was graduated from Yale College in 1813, and, after being licensed to preach by the Theological Seminary at Andover, accepted, in 1818, the post of Professor of Mathematics in the University of North Carolina, at Chapel Hill, in that state. Here he remained until the end of his life, a period of thirty-nine years, being transferred, however, in 1825 to the chair of Chemistry, Mineralogy and Geology. These facts imply great breadth of learning, which indeed he possessed; but natural science was his favorite study, and, though not a titular professor of botany, he was an enthusiastic and accomplished botanist. One of his biographers has said that "when he died he was known in almost every part of North Carolina, and he left no one behind him better acquainted with its mountains, valleys and plains; its birds, beasts, bugs, fishes and shells; its trees, flowers, vines and mosses; its rocks, stones, sands, clays and marls. Although in *Silliman's Journal*, and in other periodicals less prominent, but circulating more widely nearer home, he published many of his discoveries concerning North Carolina, yet it is to be regretted that he did not print more and in a more permanent form." It would doubtless have thus appeared that he knew, and perhaps justly estimated the worth of, many facts which much later investigators have proclaimed as their own remarkable discoveries. But the information that he gathered was for his own enjoyment and for the instruction of his pupils. On these he lavished, to their utmost capacity for reception, the knowledge that he had gathered by his widely extended observations, and had stored up mainly in the recesses of his own singularly retentive memory." In the extracts from his note-books and the comments of his friends, which are given in the article from which we quote, it is interesting—in these days of perhaps excessive specialization—to read how all the natural sciences went hand in hand in his mind and his daily labors. In one memorandum book he wrote, when preparing for a journey: "Objects of attention—geology, botany, height of the mountains, positions by trigonometry; woods, as the Fir, Spruce, Magnolia, Birch; fish, especially trout; springs; biography," and so on. And among his baggage he notes "two barometers, a quadrant, a vasculum for plants and a hammer for rocks." Of course a man whose energies, no matter how great they may be, are thus widely spread, can rarely reach the highest eminence in any one branch; but in a little known and interesting region, where scholars and explorers were few, such a many-sided absorber as Dr. Mitchell was especially able to do good service to science, and his own pleasure must have been infinitely greater than that of the most devoted specialist. His most noteworthy claim to remembrance was his service in ascertaining the exact altitude of the highest peak in the Appalachian range, that peak of the Black Mountain in Yancey County, North Carolina, which is loftier even than Mount Washington. It was at first generally known in the

neighborhood as Mount Mitchell or Mitchell's High Peak, although after his explorations in 1844 this name was attached to another, which is rightly "Party Knob." Prompted by controversies with regard to the justness of his calculations and the exact peak whence they had been made, Dr. Mitchell made a fifth ascent of the mountain in 1857, and then lost his life, probably falling in a storm into the pool where, some time afterward, his body was found, at the foot of the falls now called by his name. A year later his remains were removed from the graveyard at Asheville and buried beneath the Balsam Fir whence his famous observations had been taken on the very top of the highest peak of the mountain. His name was definitely given to this peak by the United States Geological Survey of 1881–1882, and there his monument, a simple shaft twelve feet in height, will long stand on the most elevated spot in eastern North America.

We may add that Dr. Elisha Mitchell, or Professor Mitchell, as he is more often called, should not be confounded with Dr. John Mitchell, a Virginian botanist of earlier date, for whom his correspondent, Linnæus, named our pretty Partridge-berry.

Notes.

It is stated that Mr. Ruskin maintains a Cherry-orchard solely for the benefit of the birds on his estate.

In a late bulletin issued by the New Jersey Agricultural Experiment Station, Professor Halsted describes nine distinct kinds of Fungus which attack the Sweet Potato and cause it to rot.

An olive-oil factory is soon to be built in Sonoma County, California, by a company which now has sixty acres of six-year-old Olive-trees and is planting 700 acres more. The plant will cost $250,000.

The leaves of *Daboisia Hopwoodii*, an Australian shrub, are chewed by the natives in the same way that the leaves of Tobacco are chewed, and bid fair, it is said, to become a rival to Tobacco. They contain an alkaloid, piturine, which is identical or closely related to nicotine, the action of the two being in every respect identical.

The newest Oxalis, which was introduced to the trade in Europe by Herr Dammann, is *O. sensitiva*, and, says a foreign periodical, "is even more beautiful and interesting, as regards its foliage, than *Mimosa pudica*. The finely cut leaves are in almost constant motion, and fall together at the slightest touch. They form charming frills around the clusters of yellow flowers." Like the common Oxalis, this is a wood-plant, which can easily be cultivated even in shady localities.

The *Revue des Sciences Naturelles Appliquées* says that among the food-producing plants valued in Abyssinia, but elsewhere unknown or little prized, are: *Coleus tuberosus, A. Rich.*, which has fleshy tubers resembling the potato in taste, although not in shape, and is grown at an elevation of from 6,000 to 7,000 feet above the sea; *Brachystelma lineare, A. Rich.*, which grows in moist shady situations in the valleys and furnishes large fleshy tubers; *Campanula esculenta, A. Rich.*, the roots of which are eaten, and *Cyanotis Abyssinica, A. Rich.* (*Commelina hirsuta, Hochst.*), which is also a tuber-bearing plant.

Some of the lessons drawn by the *American Agriculturist* from the immense crops of Potatoes grown in competition for the prizes offered by that paper are: That cutting the seed-potatoes into sets with two eyes each gives most general satisfaction; that large or medium sized potatoes are best for planting; that the sets should be slightly sprouted before being planted, although they should be cut before the sprouts have started; that planting should be delayed until settled weather; that placing the sets directly upon stable manure is bad practice, and that concentrated commercial fertilizers are better as a rule than stable manure.

The December issue of Hooker's *Icones Plantarum* is devoted to figures and descriptions of Indian Orchids of the genera Dendrobium and Bulbophyllum, the descriptions being supplied by Sir Joseph Hooker, who is now engaged in studying these plants for the Flora of India. Of the species included in this part only *Dendrobium Moulmeinense* is of garden interest, all the others being supplied with small and inconspicuous flowers. *D. Moulmeinense* belongs to the same group as *D. dixanthum* and is a native of the same country, differing, however, from that species in its more slender stems, pendulous habit and deeper fimbriation of the lip.

The Directors of the Madison Square Garden Company announce a grand competitive Chrysanthemum show, to be held on November 1st, 1891. The company offers $1,500 to be given in prizes, and a large number of ladies well known in society are aiding the project by their influence, as well as by liberal contributions to the prize fund. Nowhere in the country are Chrysanthemums grown in greater perfection than in the neighborhood of this city, and it is to be hoped that next autumn a display will be made which will at least equal in merit the shows in Philadelphia and Boston, not to speak of a dozen less important places. The managers of this enterprise are to be commended for this seasonable announcement of their plans.

The Northern California Citrus Fair is now in progress at Marysville, and here there are to be seen displays of oranges, lemons and other semi-tropical fruit, grown in places which have the same latitude as St. Louis or Kansas City. No protection of hedges has been given to Orange-groves, and growers declare that their losses from frost have been no heavier than they have been in Los Angeles or San Bernardino. One of the singular features of the fair is the presence of beautiful oranges from the foot-hills of Placer County, once the foremost mining county of the state. Old mining ditches and flumes have been repaired and are now used to irrigate orchards. If the original gold-hunters could return they would be amazed to find their old prospecting grounds transformed into groves of tropical fruit.

The London *Telegraph* said not long ago: "An individual living in the Department of Aveyron, France, struck by the high price at which mushrooms were being sold in his district, conceived the idea of fabricating the delicacy out of turnips. He cut the turnips into rounds, dried them, and, after giving them a dab of the paint-brush, disposed of them to unsuspecting customers as the genuine article. For some time he drove a thriving trade, but, unluckily for him, he one day sold a batch to a gourmet who was not so easily to be taken in. Indignant at the trick played on him, the gourmet brought an action which has just resulted in the condemnation of the mushroom-manufacturer to two months' imprisonment. It was in vain that he pleaded that he had enabled his fellow citizens to regale themselves on a vegetable which they regarded as a good specimen of the mushroom at a cost far below that commanded by the real article. Vain, too, were his efforts to demonstrate that his mushrooms could be consumed without entailing disastrous consequences on lovers of the delicacy. The court turned a deaf ear to his specious arguments, and has allowed him two months' leisure to meditate on the error of substituting dried turnips for honest mushrooms."

In an interesting article on Anemones, published in the December number of the *Illustrirte Gartenzeitung* of Vienna, Dr. Carl Mueller says of *Anemone coronaria* that it grows in western and southern France, in Italy, Dalmatia, Turkey, Greece and the Levantine countries, as well as in Algiers, but then explains that one thinks of it especially as the characteristic flower of Palestine. Here, he says, "it as commonly grows wild as about Smyrna and in Asia Minor, spreading far and wide as the most beautiful of spring blossoms, growing on chalk soil along the edges of shrubbery. We cannot wonder that it was already in ancient times a favorite of the inhabitants and excited in poetic minds sensations such as can only be excited by surprising beauty. '*I am the Rose of Sharon and the Lily of the valleys*,' sings the first verse of the second chapter of Solomon's Song, and there can be no doubt to-day what is here meant by the Rose of Sharon. It was an American, Fiske P. Brewer, who decided this question, *Narcissus Tazetta*, which likewise grows in Palestine, having previously been considered the Biblical flower. This gentleman, according to the *Edinburgh Review* of 1886, while traveling in the year 1859 from Jaffa to Ranleh, came upon a place where a considerable expanse of ground was half covered with brilliant red flowers. At the sight of them some of his native companions immediately exclaimed 'Roses of Sharon'; and, when he inquired about the name, he was told that the Anemone was there universally so called. In truth it would not be easy otherwise to speak of a Rose in Palestine, for native Roses do not exist there—at least not where they would justify the association of the Plain of Sharon with their name. Wild Roses are found in Palestine only on Lebanon, or where, here and there, *R. centifolia* is cultivated for the production of attar, as in the Wadi-el-Werd (Rose-valley) near Hebron. According to Ebers and Guthe, in their 'Palestine,' the translations of the Bible often use the word Rose where there is no warrant for understanding by it a true Rose. The Roses of Persia and Media were not introduced into Palestine before the Grecian period."

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The "Sauce" of Architecture.

AN architect who has studied in Paris, and, unlike many of his American brethren whose opportunities have been as good, has learned to appreciate the interest and importance of landscape-gardening and its vital connection with architecture, said, not long ago: "Yes; all French architects feel as I do, and in the studios they call landscape-gardening 'la sauce de l'architecture.'"

Now, a Frenchman's idea of the importance of a sauce is very different from our own, and one must know Parisian dinners and Parisian cooks to appreciate the full import of the phrase. Nevertheless, taking it in its highest potency, we are inclined to utter a mild protest against it. A truer simile would suggest the difference between an article of food which is cooked or prepared in any way and one which is raw. In any case where landscape-architecture might help the sister art (which means in every case except that of a building on a closely covered city street) there is as much necessity for its service as for the service of fire upon meat. A building badly placed when it might be well placed and surrounded is worse than ungarnished, it is incomplete. Moreover, in most cases, the way in which it should be placed and surrounded is not an open question for the architect to decide as he will. It is a question decided largely in advance by unalterable facts and settled canons of taste, and these the landscape-gardener is better fitted than the architect to understand. Take the instance of a country house. If the domain is small there will hardly be more than one spot where it can be set and one way in which its entrances and chief rooms can be arranged for convenience and good effect, and success here is involved in the arrangement of the grounds, as well as in that of the building. The architect cannot safely design the house without studying its relation to neighboring streets and structures and to the character of its own site, and then call in the landscape-gardener to add a "sauce" that will make it attractive. If he does this the owner is apt to find his chief windows looking where they should not look, and his entrances placed where they will necessitate inconvenient approaches, and these in their turn spoiling the grounds by preventing the best arrangement of lawns and gardens. If the domain is larger the problem is only more complicated, and more likely, if improperly attacked, to result in error and loss.

Not long ago an architect who stands high in popular repute was asked to design a large country house in a picturesque situation a mile or two from a New England town. Being unfamiliar with the spot, yet feeling obliged to begin his work in winter, he took a flying trip from his office in another city, drove up to the house of a friend in a sleigh, and asked for guidance to his client's property. There, walking about for just a quarter of an hour, he decided upon the site, turning a deaf ear to his friend's remonstrance that the view was so noble it ought to be carefully considered, and that it could not be considered when the trees were leafless, and the little lakes, so immensely important in summer, were blotted into the solid ground by a universal sheet of snow. To-day the house stands where no one would think of placing it who meant to live in it and had the slightest feeling for the beauty of nature. No garnishing, though supplied by the greatest landscape-gardener who ever lived, could now change this ruined estate into a fine one. Only a few miles from this is another large country house which, apparently for the sake of having it well seen from the highway, has been placed on the summit of such a steep rise in the ground that the carriage approach has been carried to the highway by a grade so heavy and a turn so sharp that even skillful drivers run danger of disaster every time they traverse it.

Nor should these be thought extreme cases. They could be matched by a thousand others of every-day occurrence. At every step, in every part of the country, we see what might have been fine places spoiled by the placing of the house, and even fine houses robbed of their right effect, because their builders thought of nothing beyond the conspicuous placing of the structure. Not every picture shows to best advantage when hung in a bright light in the centre of a wide field of wall, though a picture is an independent work of art. This a building never is; yet we constantly see proof that an architect thinks his structure will look best when most boldly shown from a hill-top or some exposure where no plantations can screen it from the road. It is a fatal mistake to think of the house as something independent of its surroundings. Even when its aspect has been more wisely considered, questions of prospect have often been forgotten. Or else the view from the piazzas and windows has been borne in mind while the aspect of the house from a distance has been neglected. To consider both together means a wider range of view than most of our architects take, and to secure excellence in both (which often necessitates a compromise involving some sacrifice in both directions) a power of foresight is demanded and a degree of skill which only a study of the art of landscape-gardening can give.

In our country hardly any one but professed landscape-architects has studied this art at all, while in France some knowledge of it is regarded as essential to architects. Here, therefore, the architect will do well not to trust himself, but to ask for the help of his brother artist. And, of course, he must ask it in advance, and not when his own labors are ended. We should be glad if all American architects were convinced of even as much as is expressed by the careless studio phrase we have quoted—if all could feel about sauces as Frenchmen do and then really be convinced that landscape-gardening is the "sauce of architecture." But this would only be a half step in the right direction. Happier still will be the time when they will realize that a building and its surroundings are one and indissoluble, that they must be considered together from the very outset, and that the claims of the one should never be unduly pushed to the unfair detriment of the claims of the others. There may be cases when a mere "sauce" of ornamental planting after architectural completion will serve. But almost always the work to be

executed can be rightly executed only in some way determined in advance by causes which must be studied according to the canons of landscape-art as well as of architecture. Very often the only choice will be whether a building of this character is to be placed on a given spot; with that determined, the one right way of treating both house and site will be prescribed by conditions which the architect cannot ignore; or if he does, no subsequent dressing by a landscape-gardener can redeem or even mask the error. And when a choice is possible between different good methods of planning and treatment, still this choice must be preliminary to the architect's action and should not be made according to his lights alone.

A Vase of Chrysanthemums.

AS a contrast to the group of Chrysanthemums of a single sort which we published some weeks ago (vol. iii., p. 397), we now present on page 43 a picture of a vase in which five flowers, each of a different kind, have been placed. We do not consider the arrangement entirely fortunate, as the weak stems of the two on the right of the picture hardly harmonize with the sturdier bearing of the others. But it will at least serve as a hint of what may be accomplished by thus contrasting specimen flowers of different forms and colors. It is often said that the best way to arrange Chrysanthemums, and, indeed, most kinds of flowers, is in groups or masses of a single kind. Certainly this advice is good, because eminently safe. So long as excessive crowding is avoided a really unbeautiful effect can hardly be produced with flowers of one kind with their foliage; moreover, it is always easier to find an appropriate place and background for such a group than for one of varied colors, and our readers hardly need to be told again that the beauty of a vase of flowers depends as much upon its proper environment as does the beauty of a painting. Nevertheless, safety is not the only, nor always the highest, aim even in arranging flowers, and too close an adherence to the generally excellent practice of massing may deprive us of occasional effects whose beauty, depending upon harmonious contrasts, is especially striking and individual. Feeble painters, we may say in explanation, are apt to win success by using a simple scheme of color and attempting no vivid contrasts, and great painters constantly do the same; but occasionally a great painter will boldly put the most strongly contrasted tones together—even upon occasion scarlets and crimsons—and produce a more striking sort of beauty by the harmony he wins from them. And so with flowers we may well at times exercise our taste in trying to produce a harmonious group with strongly contrasting blossoms. In our picture, for instance, the uppermost flower is of the deep yellow variety called Kioto; the central one is G. F. Mooseman, whose color is a dull crimson within the florets and a light brown without; the one to the left is a pure white blossom of Mrs. Langtry; the upper one on the right is a pink Mrs. Fottler, and the one beneath it is a bright yellow named Gold. Those who can command a variety of Chrysanthemums will do well some day to repeat this arrangement with the same flowers or others of similar colors. It requires care to make a coloristic success of such a group; but if the result does not suit them they will at least have a starting-point for an interesting series of experiments which may result in some other varied arrangement of entire and surprising beauty.

Muskau—A German Country Park.

THE River Neisse flows with no great rapidity from its source in the highlands which divide Germany from Austria to its meeting with the Oder in the plains south-east of Berlin. Its total length is perhaps one hundred miles, or about that of our New England Merrimac or Housatonic. In the lower half of its course it traverses an exceedingly sandy region, out of which the river has carved a shallow and crooked valley. Occasionally a cheerful meadow lies along the stream, but the banks or hills which bound the valley, and all the uplands beyond, are covered with a dismal and monotonous forest of Pines. The region has few natural advantages and little natural beauty.

In 1785, in the moated house of the Count or Lord of a part of this forest-country, was born a boy who was destined to work a wonderful revolution in the scenery of his native valley, and by so doing to awaken throughout Germany an interest in designed landscape which is still active and growing. This boy, Ludwig Heinrich Hermann von Pückler, became a restless youth, who first attempted at Leipsic the study of law, then tried and abandoned the military life, and finally declined to enter even the civil service of his country, because, as he said, "my liberty is too dear to me."

At the age of twenty-one he set out on a round of travels which occupied four years. He saw Vienna, Munich, Switzerland, Venice, Rome, Naples, southern France, Paris and the lands between, for all his journeying was done either on foot or on horseback. In 1812 he was cordially received by Goethe in Weimar; and in the following year, under the Duke of Saxe-Weimar, he was military governor of a post in the Netherlands. When peace was established he made his first visit to England, where he saw the landscape works of Brown and Repton; and in 1815, his father having died, he at last turned homeward to his Standesherrschaft of Muskau, on the River Neisse.

There is every reason to believe that the idea of improving the surroundings of his home and village had been cherished by Pückler during all his wanderings. His letters show his intense interest in both natural and humanized scenery; and they make it evident that the sight of the great works then lately accomplished in England had only made him the more eager to begin the arduous task he had set himself.

This task was nothing less than the transformation of the almost ugly valley of the Neisse into a vale of beauty and delight; and the great distinction of his idea lay in the fact that he proposed to accomplish this transformation not by extending architectural works throughout the valley—not by constructing mighty terraces, mile-long avenues or great formal water-basins, such as he had seen in Italy, at Versailles and at Wilhelmshöhe—but by quietly inducing Nature to transform herself. He would not force upon his native landscape any foreign type of beauty; on the contrary, his aim was the transfiguration, the idealization of such beauty as was indigenous.

In the picture galleries of Europe he had seen the first-fruits of the young art of landscape-painting. In common with the painter he had found in the study of the beauty of nature a source of pure joy which the men of the renaissance had failed to discover. Somewhere and somehow he had learned the landscape painter's secret, that deepest interest and finest beauty spring from landscape-character—character strongly marked and never contradicted. In England he had seen this truth illustrated by actual living landscape, for Repton's parks were simply the idealization of characteristic English scenery.

Accordingly we find Pückler, on his return to Muskau, intent upon including in one great landscape-scheme his schloss, his village, his mill, his alum works and all the slopes and levels which enclose them—intent upon evolving from out the confused natural situation a composition in which all that was fundamentally characteristic of the scenery, the history and the industry of his estate should be harmoniously and beautifully united.

One circumstance greatly favored the happy accomplishment of his design—namely, the very fact that he had to do with a valley and not with a plain or plateau. The irregularly rising land skirting the river-levels supplied a frame for his picture; the considerable stream, flowing through the midst of the level, with here and there a sweep toward the enclosing hills, became the all-connecting and controlling element in his landscape. Well he knew that what artists call "breadth" and "unity of effect" was fully assured if only he abstained from inserting impertinent structures or other objects in the midst of this hill-bounded intervale.

On the other hand, his difficulties were many and great. To restore the unity of the river-level just mentioned he had to buy and remove a whole street of village houses which extended from the town square to the mill. To perfect the levels themselves required the removal of the wild growth from many acres and the cultivation and improvement of the soil. To carry the park lands completely around the village, so as to make the latter a part of the perfected scene, and to otherwise rectify the boundaries of his estate, required the purchase of some 2,000 morgen of land. Moreover, the hill-slopes behind the village, where the Count particularly wanted a background of rich verdure, were so barren they would hardly grow even Pines, so that these and many of the other upland slopes of the estate had to be improved at much cost and trouble.

In the valley the pre-existing but confused elements of breadth and peace and dignity were to be developed and enhanced. In the thickets of the lowlands and along the bases of the hills were found many large Oaks and Lindens which helped much to give character to the intervale. In the upland

regions the original tangle of knolls, dells and glades was to be made still more pleasantly intricate by opening the wood here and closing it there, and by breaking and fringing the original Pine-forest with a great variety of appropriate trees and shrubs. This work of introducing more cheerfulness and variety proceeded gradually with the happiest results. To-day the crooked ways which follow the hidden dells in the woods are as charming in their way as is the central valley of the Neisse, while the roads which lead along the edges of the heights and command views of the valley are the most delightful of all. It would be difficult to make choice between the view from the low-lying schloss over the quiet meadows to the semicircle of hills beyond the river and the reverse view from these hills looking across the stream and the intervale to where the turrets of the schloss and the long row of village roofs lie close together under the edge of the dark woods which crown the western range of heights. When his thirty years of pleasant toil were passed Pückler tells us he was one day showing his results to a very intelligent and discriminating lady of his acquaintance who told him "very modestly" that she had little knowledge of the art of designing parks, and that she could recall many scenes grander and more picturesque than the one now before her; "but here," she said, "what strikes one first and gives one most delight is the repose which pervades the whole scene"; and the Count adds that no praise ever pleased him more.

The plan, see page 41 (for the original draft of which I am indebted to Dr. Carl Bolle of Berlin), must serve to explain the general arrangement of the estate. Within the park are included not only the chateau and its gardens, pleasure-grounds and appurtenances of all sorts, but also the very ancient castle hill, the old schloss of the Count's more immediate predecessors, the close-built village of Muskau, with its churches, schools, shops, etc., many acres of plowed land owned and cultivated by the villagers with other acres farmed by the Count, a Pine-woods hotel and sanitarium, an arboretum and nursery, a woodland cottage called "the English house," used as a holiday resort by the townspeople, a large grist-mill, an alum mine, the ruin of the oldest church in Lausitz, and more than one ancient grave-yard. In most directions the park has no definite boundary. It flows into the ordinary Pine-forest on many sides, and in several directions the country roads are "parked" for many miles.

Always keeping in mind his general scheme, Pückler was occupied during thirty years in extending his works and developing the details. At the end of that time he suddenly sold his creation! Muskau passed to Prince Frederick of the Netherlands. He who had become Prince Pückler-Muskau was obliged, like many a landscape painter, to confess himself a victim of his love of beauty. In his zeal for his art he had outrun his resources. At the age of sixty he retired to his lesser manor of Branitz, where he wrote his invaluable books and passed a peaceful old age, varied by many journeys and many visits to the country-seats of friends. He died in 1873.

All Germany has long held him in high honor. In England, the "Letters of a German Prince," as the translation of his "Briefe eines Verstorbenen" was entitled, passed through several editions, and remains to this day the best foreign delineation of the England of his early manhood. His essays on landscape were long since translated into French, and it is to be hoped that they may yet appear in English, for they contain a very clear presentation of the elements of landscape design, as well as many lively descriptions of his work at Muskau.

The significance, for us Americans, of this work at Muskau is very obvious. To be sure at least one-third of our great country is so arid that luxuriant vegetation must depend on irrigation; and, where this is the case, a pleasure-ground becomes an oasis to be sharply marked off from, and contrasted with, the surrounding waste. Spanish models will help us here. But the other half of our continent presents verdurous scenery of many differing types, from the rocky Pine-woods of Quebec to the Palmetto-thickets of Florida. Throughout this varied region there is a woeful tendency to reduce to one conventional form all such too meagre portions of the original landscape as are preserved in private country-seats and public parks. What shall check this tiresome repetition of one landscape theme? When shall a rich man or a club of citizens, an enlightened town or a pleasure resort, do for some quiet lake-shore of New England, some long valley of the Alleghanies, some forest-bordered prairie of Louisiana, what Pückler did for his valley of the Neisse? He preserved everything that was distinctive. He destroyed neither his farm nor his mill nor his alum works; for he understood that these industries, together with all the human history of the valley, contributed to the general effect a characteristic element only second in importance to the quality of the natural scene itself.

Our countrymen are beginning to manifest an appreciation of landscape-painting; let them show the genuineness of their appreciation by preserving and enhancing the beauty of the actual landscape in which their lives are passed.

Boston. *Charles Eliot.*

Plant Notes.

Lyonothamnus asplenifolius.

THE following note is extracted from an interesting account of this tree contributed by Professor Henry Chapman Ford to the *Bulletin of the Santa Barbara Society of Natural History:*

"In the summer of 1885 Mr. Barclay Hazard, of Santa Barbara, during a visit to the island of Santa Cruz, noted a new and peculiar shrub or small tree, and called the attention of the fact to Professor E. L. Greene, of the California University. During July of the following season (1886) Professor Greene visited the island and found Mr. Hazard's discovery to be a new species of Lyonothamnus, and later, in the *Bulletin of the California Academy of Sciences*, described it under the name of *Lyonothamnus asplenifolius*.

"In 1888 Mr. Brandegee found the same species on the island of Santa Rosa, but he states that 'the trees were small and often distorted by the wind.'

"Professor Greene found it growing in a hundred fine groves distributed up and down the thirty miles of the northern slopes of Santa Cruz. He speaks of specimens often as high as thirty-five or forty feet, and says: 'No other small tree of our coast equals this in grace of form and beauty of foliage. The flowers, too, are quite showy in their season, the larger corymbs often measuring a foot in diameter,' adding that 'the wood, close-grained and hard, was called iron wood by the men of the island.'

"As early as 1875 the writer was informed of the existence of this 'iron-wood' and vainly endeavored to procure specimens at the hands of sailors and others frequenting the island.

"It was not until this season (1889) that opportunity offered a personal inspection of the growing trees. In a recent visit to Lady Harbor Dr. Yates and myself climbed the precipitous slopes near, and upon the rocky ridges we found large groups of Lyonothamnus, obtaining specimens of the wood, bark, leaves and corymbs of seed capsules, which were shown at a late meeting of the Society. The trees were in clumps of from five to fifteen individuals, and of different diameters, ranging from a half inch to six or eight inches. The outer bark is deciduous, parting in tough strings from the trunks of the larger specimens, leaving the inner portion rich in reddish brown color. The beautiful Fern-like foliage seems to be deciduous, yet the tree may not be entirely bereft of leaves at any time. The flowering season having passed, deprived us of judging of their beauty. The trunks are quite straight, the branches springing from them somewhat in whorls at regular intervals. We noticed no seedling specimens, yet it is probable that other localities might furnish them.

"Examples of the wood of various diameters were obtained. It is exceedingly close-grained, hard, and of similar specific gravity to many tropical species. Specimens are in the process of seasoning with a probability that the wood will prove susceptible of taking a high polish with fine color. Notwithstanding its great weight proportionate to the size, it is said to be quite brittle when green. When seasoned it has long been a favorite wood for handspikes used by the sailors and others who have knowledge of its strength.

"The *Lyonothamnus asplenifolius* adds another singularly beautiful tree to our already long and desirable list that should be introduced in ornamental planting. Its showy flowers, rare foliage and general novelty should make it a favorite wherever planted. Its propagation by seeds ought not to be difficult, as they are produced in profusion.

"It belongs to the order *Saxifragaceæ*, and is the first tree of the family that has yet been discovered in North America, most representatives of the order being herbs or shrubs."

In a personal letter from Professor Ford he adds: "I am satisfied that the close-grained wood of this tree may become a rival of Turkey Box-wood for fine wood engraving. It possesses certainly the advantage over that wood of being obtainable in much larger blocks. Beautiful paper knives, with finely carved handles, have been wrought from it; but I have no doubt that it would serve for the manufacture of tool-handles and for various articles in turnery, as it can be made to take a high polish."

New or Little Known Plants.

New Orchids.

Lælia anceps, var. Thomsoniana, O'Brien.—Described as an exceptionally large and brightly colored variety, near the variety *Amesiana*. The segments are delicate blush-rose, and the lip very darkly colored. It appeared in the collection of W. J. Thomson, Esq., of St. Helens, Lancashire.—*Gardeners' Chronicle*, December 20th, p. 716.

Cypripedium × Leeanum, var. giganteum, Rolfe, is an exceptionally large form, raised by Messrs. Heath & Son, of Cheltenham, from *C. Spicerianum* fertilized with the pollen of a large form of *C. insigne*. The dorsal sepal is over two and three-quarters inches in diameter, and the petals two and seven-eighths inches long, and barely under an inch across near the apex.—*Gardeners' Chronicle*, December 20th, p. 718.

Cymbidium Tracyanum, Hort., is a large and showy Cymbidium which I believe to be a variety of *C. grandiflorum*, Griff. (*C. Hookerianum*, Rchb. f.), with the sepals and petals striped like a dark-colored *C. giganteum*. It agrees in other respects. The flowers are five and a half inches in diameter. It was exhibited by Mr. H. A. Tracy, of Twickenham, at a meeting of the Royal Horticultural Society on December 9th last, when it was awarded a first-class certificate. A few days later the plant was sold for seventy-five guineas to Messrs. F. Sander & Co., of St. Albans.—*Gardeners' Chronicle*, December 20th, p. 718; also December 15th, p. 702.

Masdevallia Schroederiana, Hort.—This pretty little Masdevallia, described on an earlier page of these notes, is figured in the *Journal of Horticulture*, for December 25th, p. 557, Fig. 74.

Rodriguezia Fuerstenbergii, Kränzlin, is a lovely species allied to *R. Leeana*, Rchb. f., with pale rose sepals and snow-white petals and lip, the latter with a golden yellow blotch and eight lines of the same color on the disc. The flowers are two inches long. It appeared in the collection of Count Fuerstenberg, of Donaueschingen, from an importation made by Messrs. F. Sander & Co., of St. Albans.—*Gardeners' Chronicle*, December 27th, p. 746.

Cypripedium × Eyermanianum, Rolfe, is a distinct and pretty hybrid raised in the establishment of Messrs. F. Sander & Co., of St. Albans, between *C. barbatum grandiflorum* and *C. Spicerianum*, the latter believed to be the pollen parent. As in many other cases, it presents a curious combination of the characters of the two parent species. It received an award of merit from the Royal Horticultural Society on November 11th last.—*Gardeners' Chronicle*, December 27th, p. 746.

Cypripedium × Deboisianum, Ch. de B.—A hybrid raised by Messrs. Edm. Vervaet & Co., of Mont St. Amand, by crossing *C. venustum* with the pollen of *C. Boxallii atratum*. It received a certificate of merit from the Société Royale d'Horticulture de Gand, and from the Chambre Syndicale des Horticulteurs Belges.—*Gardeners' Chronicle*, December 27th, p. 747.

Kew. *R. A. Rolfe.*

Foreign Correspondence.

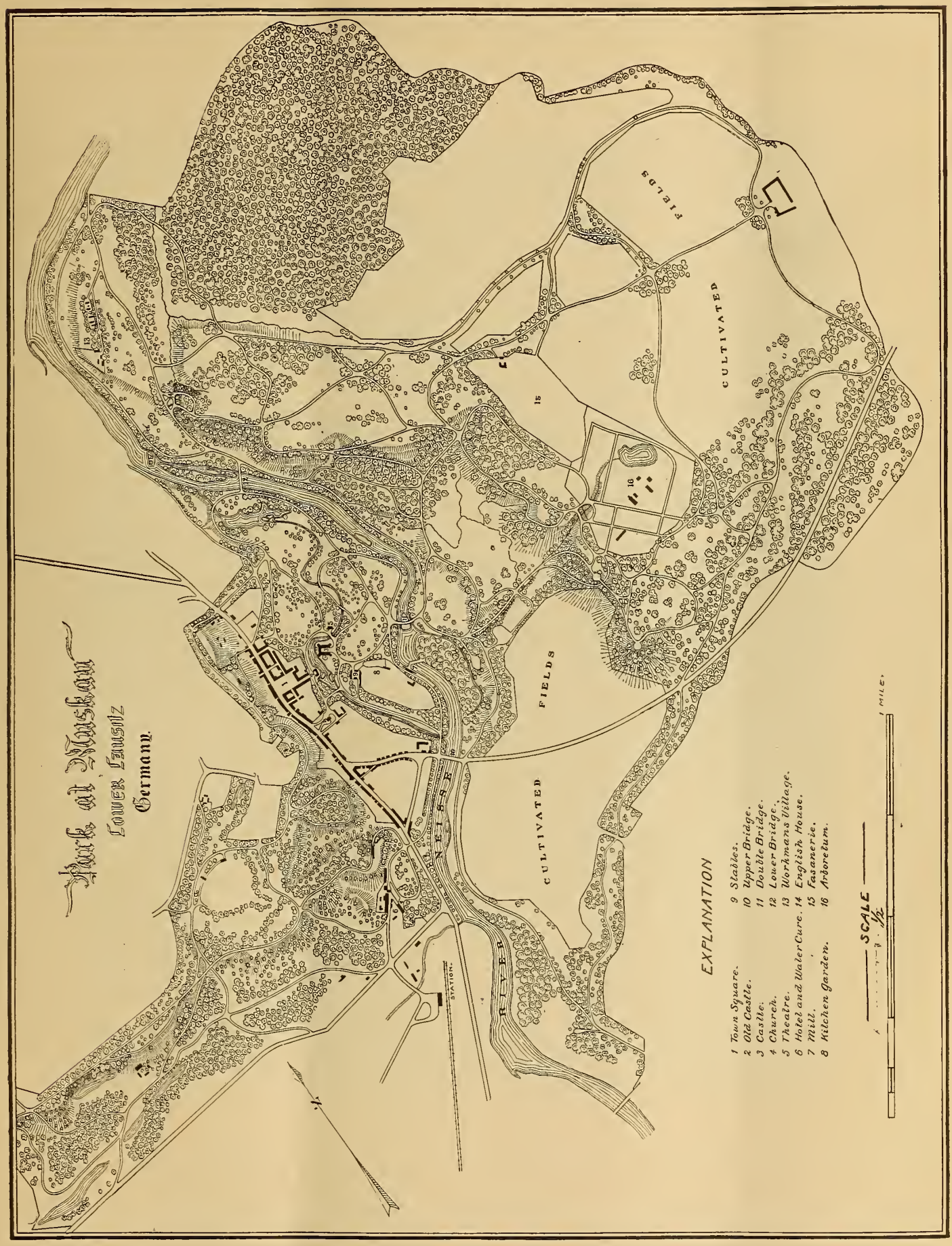
London Letter.

Low Temperatures for Tropical Plants.—The minimum temperature that a plant will endure with impunity cannot apparently be arrived at without actual experiment. The temperature of its wild habitat affords little or no assistance upon this point. It frequently happens that one of two plants from a given locality will bear exposure to severe frosts, while the other cannot endure even a degree or two. Instances of this nature are common among the plants from New Zealand, the Cape and Japan. We sometimes laugh at the apparent absurdities committed by our grandfathers in growing the Chusan Palm, *Aucuba Japonica*, *Sophora Japonica*, *Ginkgo biloba*, *Areca sapida* and many more in greenhouses, or even stoves, from a belief that they required such treatment. But in all these cases it has been only after experiments extending over a long period, or by accident, that the "hardiness" of these plants in England has been discovered.

The cold weather of the past month here, coupled with dense fog at times so black as to almost produce darkness, has necessitated exceptional treatment for many in-door plants. It is an established axiom in horticulture that the intenser the light, the higher the temperature may be, within reasonable limits, with advantage, and of course the converse of this is equally sound. When, therefore, the day is almost as dark as the night, we make it the rule to keep the temperature of the houses the same for the day as for the night. Consequently, the temperature in the large Palm-house at Kew has during the past cold, dark weather been kept regularly at about fifty-five degrees, and on several occasions it has even fallen to fifty degrees, while scarcely once has it risen to sixty degrees. In very severe frosts, especially if accompanied by cold wind, more harm is done by the hard firing necessary to keep a temperature of, say, sixty degrees, than by the five degrees lower temperature. It has been proved at Kew that stove plants generally in winter are happiest when kept in a minimum temperature of from fifty-five to sixty degrees, with a fairly dry atmosphere. The plants in the Palm-house include such intensely tropical subjects as the Durian, Cocoanut, most of the Palms from Mauritius and the Seychelles, Pandani of many kinds, in fact, representatives of nearly all of the most tropical forms of vegetation. The minimum temperature that such plants are called upon to endure when in a wild state is, according to Humboldt, seventy degrees. Yet, in glass houses in England it has been proved that they will bear a temperature as much as twenty degrees below this without apparently suffering in the least. It is possible that many of them would bear even more than this. We have proof of the hardier nature, hitherto unrevealed to horticulturists, of some of the tropical genera of Palms, such as Caryota, Oreodoxa, Seaforthia, Cocos and Chamædorea, which have endured in the large temperate house at Kew a temperature of from forty to fifty degrees for about three weeks.

Landscape-gardening.—Mr. William Morris, poet and socialist, has contributed to the *New Review* for January a paper on "The Socialists' Ideal in Art," in which he points out the relations of art to society. Art, he says, "is kept alive by a small group of artists working in a spirit quite antagonistic to the time; and they also suffer from the lack of co-operation, which is an essential lack in the art of our epoch. . . . Nor have they any position or power of helping the public in general matters of taste. For example, in laying out all the parks and pleasure-grounds which have lately been acquired for the public, as far as I know, no artist has been consulted, whereas they ought to have been laid out by a committee of artists; and I will venture to say that even a badly chosen committee (and it might easily be well chosen) would have saved the public from most of the disasters which have resulted from handing them over to the tender mercies of the landscape-gardener." Mr. Morris goes on to declare that "art as it is cannot build a decent house, or ornament a book, or lay out a garden, or prevent the ladies of our time from dressing in a way that caricatures the body and degrades it." Evidently Mr. Morris holds the belief that whatever is, is wrong, except, perhaps, socialistic views. Art in the garden is like art in most things, and what is perfection in one man's eyes is sometimes abominable in another's. There are, of course, many gardens which are so badly constructed as to offend even the common eye, but it is as ridiculous to blame the landscape-gardener for these as it would be to blame painters for all the bad pictures and poets for all the trash called poetry that one meets with everywhere. A landscape-gardener should be an artist, or he has no just claim to his title; his training must be at least as strict and his taste as good as that which makes a landscape-painter. It seems to me, therefore, as absurd to set painters to make good gardens as to expect landscape-gardeners to make good pictures with oil and canvas. There is surely a great deal more in the making of a garden than the disposition of walks and beds and lawns. A knowledge of the material to be used in its composition must be of first importance, and a man who is not a gardener cannot be expected to possess this. Probably the opinion of a committee of artists on the plan of a garden or on the garden when made might be of some value to the landscape-gardener, but the latter, if possessed of the true principles of garden architecture, would, I fancy, produce a much finer garden than any committee of artists, however well selected, that did not include a landscape-gardener among them.

Tritonia and Freesia.—In an interesting article on Tritonias, by Mr. W. E. Endicott (p. 600), a statement occurs at the end which, if correct, is of considerable biological interest. It is this: "Some years ago I hybridized the white form of *Freesia refracta* and *Tritonia crocata*. Singularly enough the resulting plants bore flowers which were Freesia pure and simple, though the Tritonia was the seed parent." Mr. Endicott's contributions to your paper are so careful and accurate that I hesitate to express any doubt of the trustworthiness of the statement here quoted. Freesia and Tritonia are so different that I cannot understand how what Mr. Endicott records could have occurred. The Tritonia has large, orange-colored flowers with broad refracted segments, and they are produced on tall


Park at Muskau
Lower Lausitz
Germany.
FIELDS
CULTIVATED
FIELDS
CULTIVATED
NEISSE
RIVER
STATION
EXPLANATION
1 Town Square.
2 Old Castle.
3 Castle.
4 Church.
5 Theatre.
6 Hotel and WaterCure.
7 Mill.
8 Kitchen garden.
9 Stables.
10 Upper Bridge.
11 Double Bridge.
12 Lower Bridge.
13 Workmans Village.
14 English House.
15 Fasanerie.
16 Arboretum.
SCALE
1 MILE.

branching scapes; whereas in Freesia the flowers are tubular, curved at the base, the segments as broad as long, and, in the variety mentioned by Mr. Endicott, pure white save only a small blotch of yellow in the throat. Moreover, the scapes are much weaker than in *Tritonia crocata*. A cross between these two plants would be most interesting. Has Mr. Endicott any plants of the hybrid he raised?

London. *W. Watson.*

Cultural Department.

A Winter Campaign Against Insects.

THERE is time for a good many odd jobs during the winter in the garden and orchard, or even in the grove, where that is supposed to be kept in order, and no such odds and ends of time can be better employed than in a systematic campain against insects. In orchards usually infested by the tent caterpillar, especially if the trees are young or small, every twig should be examined against the sky for egg-masses. These encircle the twig, making an apparent swelling from half an inch to an inch in length, and are brown, smooth and glistening as if varnished. They look as though a disc of cobbler's wax had been flattened out to about the size of a half dollar and an eighth of an inch thick and then stuck round a twig of suitable size. These egg-masses when once recognized are very easily seen, and should be gathered and destroyed. The little caterpillars hatch in the spring and begin the formation of their tent, usually on the twig that bore the egg-mass. Gathering the eggs will of course prevent the formation of nests, and this is easier than to destroy the nest when once formed.

All dead wood should be removed, and trees that are badly infested by borers should be cut down and the wood burnt. If it is left, even in the wood-shed, the borers will still come to maturity, emerge at the proper time, and nothing has been gained. The Oak-pruner (*Elaphidion villosum*) sometimes infests Apple-orchards to a considerable extent. The usual habit of the larva is to bore in the branches, and at the approach of winter to girdle these inwardly to such an extent that a good high wind will break them and they fall to the ground, the larva remaining in the fallen wood and there completing its transformations. By gathering and burning all fallen twigs and branches, of course all contained insects are destroyed. Where there are Oaks on the grounds or in a grove the fallen branches should be also carefully gathered, not only for the benefit of the orchard, but for that of the Oaks themselves. Dead wood of all kinds should be destroyed. Many bark-borers and wood-borers get into young Oak and Hickory where a fire has been over the ground, and all such material should be cut and burnt. Loose bark on old trees should be removed, and the trunks thoroughly brushed with a stiff broom, which will clear the crevices of many cocoons and pupæ of the codling moth and other pests. A clean, smooth, healthy bark offers little or no chance for concealment, and other locations on rubbish, old fences, anything, in fact, on which shelter is obtainable, are selected by the insects, and these should be either removed or cleaned. A good coat of whitewash, thoroughly put on, will destroy much of the insect life hibernating on fences. It should be put on between board and post where the joints are loose, or between the rails on a fence of that description. Sheds in which produce is stored should be treated in the same way, that is, they should be thoroughly cleaned and whitewashed, and so also should cellars. A liberal use of whitewash is to be recommended not only for the insecticide effects which it may have, but because it offers a very poor resting-place for many Fungus-spores which are the cause of much of the rot and decay in fruit or produce-sheds.

Where ornamental, especially dwarf, Willows are grown, on lawns or gardens near New York, Jersey City and Newark, they should be carefully examined. There has been introduced within a few years last past a weevil, *Cryptorhynchus lapathi*, which works in Willow-twigs and branches much in the same way that the White Pine-weevil works in the leaders of so many of our ornamental conifers. The Newark collectors tell me that in some localities every Willow-copse is infested, and Mr. Machesney informs me that a Kilmarnock Willow in the grounds of a friend has been totally ruined by this beetle. It works preferably in the smaller twigs and branches, burrowing in considerable numbers, in much the same way as does the *Pissodes strobi*, and making much the same sort of cells when the larva is full grown. Wherever the presence of this insect is noted treatment should be radical, and every infested branch or twig should be burnt. The insect will undoubtedly spread and should be carefully watched. Badly infested trees, where they are small, had better be cut and burnt; larger trees should be cut back into sound wood as early as it can be safely done.

Arbor-vitæ hedges are especially subject to bag-worm attacks, and these should all be picked off and destroyed during the winter. The bags contain the egg-sack, and every sound bag means 200 or 300 larvæ early the next spring. Not only Arbor-vitæ, but other hedges and a large number of other plants and trees, are attacked. Willows are sometimes almost defoliated, and Poplars are favorites. As the larvæ do not usually wander from the tree on which they hatch, clearing a hedge or tree during the winter means practical exemption from attack in summer.

The caterpillar of the White Marked Tussack Moth (*Orgyia leucostigma*) is a great pest, especially in city gardens and streets. It is recognizable by the bright red head, shining like sealing-wax, and by the thick hair tufts on the back. These caterpillars pupate in a thin cocoon on the tree trunk, on fences, under the sills of windows, on the sides of weather-boarded houses, and, in fact, everywhere that a projection offers even a suggestion of shelter or a hold for the cocoon. The female moths are wingless, and on emerging cling to the outside of the cocoon, upon which they deposit their eggs, covering them with a pure white frothy mass, which hardens and becomes brittle, preserving the eggs from damage during the winter. These egg-masses are easily seen, and should be gathered and destroyed. In Albany, a few years ago, Mr. W. W. Hill induced some of his neighbors to unite with him in gathering the egg-masses on their premises and on the trees in front of their houses; and their trees were the only ones on the avenue that escaped defoliation. Trees that are badly infested with scale insects can be sprayed with the kerosene emulsion during the winter, and most or all of the scales destroyed. There is no foliage to interfere, and every twig and branch can be reached. The emulsion, too, can be used much stronger than is possible at other seasons of the year; the scales are more certainly penetrated and the vitality of insect or egg destroyed. One part of the emulsion to nine parts of water is both effective and safe.

It is in parks and gardens that these winter campaigns can be most successfully carried on. Cleanliness everywhere is of vital importance. Health is as essential to plants as to man to enable them to resist the attacks of insects and of Fungi. Therefore stimulate weaklings where possible, and where they do not respond destroy them. They offer a favorable soil for Fungus attack and a direct invitation to insects. Where these are once established on failing plants the healthy are in constant danger.

Rutgers College. *John B. Smith.*

The Cracking of Fruits and Vegetables.

THE cracking or bursting of fruits and vegetables during growth or at maturity is often a source of considerable loss. A better understanding of the causes of this trouble might enable us in some cases to use preventive measures. At present it must be confessed that the subject has been too little investigated. It is plain that all instances of cracking cannot be referred to a single cause, and it is quite possible that in some cases the real source of the affection has not been suspected.

In certain vegetables, as the carrot and kohl-rabi, as well as in the potato-tuber, the cracking appears to be the result of a second growth that occurs after some maturing of the tissues has taken place. When a period of dry weather, which tends to premature ripening, is followed by abundant rain, a new season of growth often begins. But the outer layers of cells being no longer capable of growth, the formation of new cells in the cambium region of the vegetable or tuber necessitates a rupture of the outer part, precisely as the formation of a new layer of wood causes ruptures in the bark of trees. The only preventive we can at present propose is the harvesting of the crop before the second growth has gone sufficiently far to cause the rupture.

The cracking of ripe apples upon the tree in wet weather appears to be due in some cases, at least, to the absorption of water through the skin. Ripe apples immersed in water will often absorb enough of the liquid to burst the skin in a few hours. This process has been ascribed to an osmotic action between the juices of the fruit and the water. In an experiment, however, there was no evidence that osmosis had taken place. After soaking an apple in distilled water for several days, during which the flesh cracked nearly to the centre, the water gave no evidence of containing glucose, and showed

only the faintish acid reaction. The preventive in this case is to gather the fruit as fast as it matures.

The cracking of apples and pears during growth is generally due to the Fungus parasite (Fusicladium) that causes the scab upon these fruits. It is, indeed, the advanced stage of this disease. The preventive is to spray the trees early in the season and at intervals thereafter with a solution composed of one and an eighth ounces of copper carbonate dissolved in one quart of aqua ammonia and diluted with twenty-five gallons of water.

The cracking of ripe tomatoes in wet weather is probably due, as in the case of ripe apples, to the absorption of water through the skin. But tomatoes sometimes crack in dry weather and while still immature, which must be ascribed to another cause. Sometimes this appears to result from an unequal ripening of the fruit. In this case a circle of cracks forms about the stem, and the portion of the skin within this circle often remains green after that of the remainder has assumed the color of maturity. The growth of the ripening part proceeding faster than that of the remainder, a rupture takes place between the two portions.

The cracking of melons often seems due to a similar cause. The blossom end of the fruit ripens faster than the stem end, and the expansion of this part causes a bursting of the apex. This difficulty appears to be characteristic of certain varieties. In a large number of seedlings of crossed parentage grown the past season some of the fruits burst from the blossom end almost to the stem, and in some cases the parts curved backward as if the fruit were being turned inside out.

The tendency to cracking of the fruit is apparently due in some cases to a pathologic condition of the plant. In an experiment in breeding the Tomato, a strain of the Cook's Favorite variety grown several generations from unripe seed formed the past season seventy-four per cent. of cracked fruits

Fig. 10.—A Vase of Chrysanthemums.—See page 38.

while the same variety grown in the meantime from perfectly ripened seed formed only 25.3 per cent. of cracked fruits. Both strains were grown under equal conditions except in the selection of the seed. In nearly all cases certain varieties are more subject to cracking than others. A difference in the elasticity or permeability of the epidermis, a difference in the absorptive power of the flesh for water, or of the liability to fungous attack, or of the tendency to ripen unequally, causes certain varieties to resist much better than others the influences that tend to cracking.

University of Wisconsin, Madison. *E. S. Goff.*

Lapagerias.

THE several varieties of *Lapageria rosea* now in cultivation may be counted among the most beautiful of greenhouse climbers, and deserving of the widest recognition. And not only in the greenhouse does their naturally graceful habit appear to advantage, but also in cut flower arrangements they deserve a prominent place, for the flowers are not only of good size but also of great substance and lasting qualities. The original species, *Lapageria rosea*, was of Chilian origin, and was first introduced to commerce by Messrs. Veitch, of London, they having received it with several other noteworthy plants about the year 1847 from that indefatigable collector, William Lobb.

Lapageria rosea may be described as an evergreen twining plant, with dark green, cordate leaves, and pendulous, bell-shaped flowers, the latter being produced from the axils of the leaves along the upper portion of the shoots, and in the type are of a dark rose color, the inner surface of the petals being more or less mottled with a deeper color. Among the variations from the type that known as *L. rosea superba* is a very good one, and is of somewhat stronger growth than the original, and also has brighter flowers. Still another is that known as the Nash Court variety, so called in honor of the establishment in which it originated, and is somewhat similar to the preceding, but claimed to be far superior in point of color and also in floriferousness.

But perhaps the most notable of all the varieties is the white one, *L. rosea alba*, the flowers of which are fully as large as the type, but are pure white in color. This does not appear to grow as rapidly or as strongly as some of the other varieties, at least when young, though after the plant becomes well established there is but little difference. As before stated, the Lapagerias are greenhouse (or cool-house) plants, and it is therefore worse than useless to attempt to force them into rapid growth by means of extra heat, as this will only result in a fine crop of insects of various kinds and in ultimate failure. It is therefore recommended that they be grown in a night temperature of forty-five degrees, and be given abundant ventilation whenever the weather will permit, and as the roots do not like to be confined too closely, the most successful method of growing Lapagerias is to plant them out in a bed prepared for the purpose in the end of the house, the end least exposed to direct sunlight being the best adapted to them. In the preparation of the bed much care should be given to the drainage, this being a very essential point, for while these plants enjoy copious waterings during the growing season, yet proper provision should be made to allow all surplus water to escape. The soil most suitable is largely composed of rough fibrous peat, to which may be added not more than one-fourth the quantity of coarse loam, and a moderate quantity of sand. Some broken charcoal may be added to the mixture, and tends to keep it fresh and sweet. The plant or plants may then be planted out and trained up wires to and along the roof of the house, a very pretty effect being gained by planting the white and rose-colored varieties in the same bed, and allowing their shoots to mingle on the roof of the house, each variety thus used heightening the effect of the other.

The propagation of Lapagerias is chiefly effected by layering and from seeds, the first being preferable where the increase of a particular form is desired, as seedlings are liable to vary. But either method requires some time for its completion, as the seedlings usually take from three to four years (and sometimes more) before they flower. Much stronger plants are secured in the same period of time by layering, and therefore this is naturally the more popular plan. Cuttings may be rooted occasionally, but this is always a long process, and frequently a doubtful one, and as such is not to be recommended.

The Lapagerias are not specially subject to the attacks of insects if they are grown in a proper temperature and thoroughly syringed every bright day (except when in flower), the most common pests to attack them being thrips and green fly, but, fortunately, both of these may be eradicated by fumigating, or by syringing with tobacco-water. Slugs are also extremely partial to the succulent young shoots as they appear above the ground, and must be trapped or otherwise guarded against.

It should also be remembered that during the summer the Lapagerias will thrive under moderately heavy shading—full exposure to our July sun being quite injurious to them.

PHILESIA BUXIFOLIA.—This is also a hard-wooded plant from South America, and is quite closely allied to the Lapagerias, so closely, in fact, that a hybrid plant has been raised between these two genera, to which has also been applied the hybrid name, Philageria. *Philesia buxifolia* is an erect growing evergreen shrub with small leaves, the character of the latter being well denoted by the specific name. It has bright rose colored waxy flowers of moderately large size, bearing some general resemblance to those of the Lapagerias, but having only three petals instead of the six found in the Lapageria.

This Philesia is, I think, the only species of the genus, and is a pretty little compact growing cool-house plant that will flourish under very similar conditions to those noted for the Lapagerias. It may be increased by cuttings, though these root rather slowly.

Holmesburg, Pa. *W. H. Taplin.*

Notes on Some Hardy Wild Roses.—IV.

IN 1887 Professor Crépin described,* under the name of *Rosa Wichuraiana*, an interesting Rose from Japan and China, which gives promise of becoming a very valuable addition to our list of desirable hardy species. Siebold and Zuccarini appear to have previously referred it to *Rosa sempervirens*, a very different species, which is a native of southern Europe and northern Africa. Later it was included by Franchet and Rochebrune with their *Rosa Luciæ*, also indigenous to Japan and China. Although it does not appear that this Rose has ever been put on the market under the name so recently given to it by Professor Crépin, yet as *Rosa bracteata* it is found in the catalogues of some German nurseries, and plants have been received so labeled at the Arboretum.

But in this again we have a very misleading name, because the true *Rosa bracteata* is a very different plant, a native of the more southern portions of China, and so far not known to be hardy here, although it has become naturalized in the far southern states. The name has also been applied to a climbing hybrid with double flowers.

R. Wichuraiana is a low trailing species, and it differs from any other Rose of similar habit in this latitude by the unusually prostrate character of its stems. Other species of trailing or climbing Roses usually grow upward for a foot or two at least before they bend over and trail on the ground, but *R. Wichuraiana* rests on the earth almost as closely as an Ivy, and it has a habit of throwing out little rootlets at various points along its creeping stems if the soil is sufficiently moist. It makes a rampant growth, and will produce stems ten or fifteen feet or more in length in a season. The leaves are composed of one, three, five, seven or nine thick, smooth, shining, stiff, small green leaflets. These are serrate, and generally short, obovate, or almost round and blunt at the apex. Generally more or less scattered along the stems are short, stout, recurved spines, which are easily removed from the young shoots. On the flowering branches the spines are small, few or absent. There are no prickles. The flowers are borne in much profusion in short, broad, somewhat pyramidal clusters on the ends of short branches and branchlets. They expand from one and a half to fully two inches across, and the petals are of a pure white color, the stamens being yellow. They possess a strong fragrance, resembling that of the Banksian Rose more than any other familiar species. The period of general flowering here appears to be from about the end of the first week in July until the end of the month. A few blossoms, however, are occasionally produced throughout the rest of the season. The ovate, deep dull red fruit does not mature until quite late in the autumn, but the seeds are generally ripened without injury from severe frosts.

Rosa Wichuraiana is quite hardy here, and probably its low trailing habit is of advantage to it in withstanding our winters. The terminal portions of the long new shoots frequently do not ripen sufficiently to withstand the cold, and they are consequently destroyed; but, in any case, enough of the stems remain to blossom freely the following summer. On account of its handsome evergreen looking foliage, its beautiful white

* *Bulletin de la Société royale de botanique de Belgique*, tome xxv., 2, pp. 189-192.

flowers, which appear after most other single Roses have done blooming, and for its peculiar habit of growth, this species is likely to prove valuable for planting on rockeries, covering slopes or embankments and the ground among open shrubbery. A little further south it will probably prove to be quite distinctly evergreen, as under some circumstances it retains its leaves throughout the winter here. The plant is one of those which may be propagated by cuttings with the greatest ease.

Through some mistake of German nurserymen this species was sent (under the name of *R. bracteata*) to the Park Department of Boston instead of another kind of Rose which was ordered. In this case, however, the mistake proved not entirely at the expense of the purchaser, for the plants are considered to be quite an acquisition. The experienced superintendent of the planting of parks says of it: "I have planted it on very exposed situations in the Franklin Park; for instance, on the top of the Overlook; and also on the slopes of the Back Bay. It stood the last winter exceedingly well; only some of the softest, latest shoots suffered a little on the tops. The six original plants in the nursery made shoots from ten to fifteen feet long the first season. I covered part of them with leaves the first winter, but there was no difference noticed in the condition of the covered and the uncovered plants in the following spring. This is the third winter I have had them." *R. Wichuraiana* is reported as found in nearly all parts of Japan, where it is said to grow on sandy or gravelly soils, often being met with on the sands near the sea-shore, and having stems which attain a length of thirty or forty feet.

The closely allied *R. Luciæ* has not yet been grown here.

In the European Field Rose (*R. arvensis*) we have the nearest approach to *R. Wichuraiana*, in habit of growth, among the hardy white-flowered species. But the Field Rose is not always fully hardy here, its hardiness apparently varying according to the climate of the region from which it was sent. Plants of it, received under the name of *R. repens*, from one of the gardens of central Germany, have proved nearly as hardy as could be wished. It is a desirable plant for rockeries, banks, and for training on walls and similar situations. As is well known, it is a form of this which is cultivated as the Ayrshire Rose.

Although possessing an interest and charm of blossom peculiar to itself, the Field Rose has a formidable competitor for popular favor in the true *R. multiflora* from Japan, which was so recently described and figured in GARDEN AND FOREST (vol. iii., pp. 404-405). This may be trained to a post or pillar, where it will attain a height of fifteen or twenty feet, making a beautiful show when its panicles of small white flowers are in their fullest bloom. It has been used in hybridizing with other species, and some interesting and valuable variations have resulted from these mixtures.

To the professional Rose-grower, however, *R. multiflora* (or *R. polyantha*, as many insist upon calling it) promises to be a great acquisition as a stock upon which to bud our choice cultivated Hybrid and Tea Roses. At the Arboretum it has been found quite equal or superior to the Dog Rose as a stock, and it has been extensively tried by some French propagators, apparently with much success. Among the advantages claimed for it is the fact that stocks are more easily propagated either by cuttings or seeds, the latter germinating within a few weeks from the time of sowing. The roots are not as inclined to be tap-rooted as the Dog Rose, and they are finer and more fibrous, which especially adapts it for forcing in small pots. Plants budded on *R. multiflora* are more easily forced and come into bloom sooner, the earliness not being at the expense of quality. The record of an experiment, on a large scale, with stocks of *R. multiflora* and the Dog Rose (*R. canina*), given exactly the same treatment and budded with one variety of Rose (Etoile de Lyon), showed that the average was twice as many blooms on the *R. multiflora* stocks, and the flowers were fifteen days earlier.

The only known hardy climbing Rose of our own country, the Michigan or Prairie Rose (*R. setigera*), is not surpassed by any other in showy character of blossom. It has also an added value in the fact that it blooms so late, the flowers being contemporary with those of *R. Wichuraiana*, or at a time when the flowers of nearly all other species have faded. It is unfortunate that, although so handsome, the flowers of the Prairie Rose are not fragrant, a fact which is against its value and popularity. Hybrids have been produced with this Rose, but none of them appear to have much perfume. It seems singular that no fruit ever appears to be formed or matured on the Prairie Rose in cultivation in this part of the country.

Arnold Arboretum. *J. G. Jack.*

Protecting Evergreen Plants.—We have been very fortunate so far this winter with our evergreens, and hardly any plants have suffered from the cold. True, it has not been severely cold; but our evergreen Magnolia plants and Gordonias look quite fresh; much more so than they will later on if they are not covered. From this time to the end of March is the trying period for broad-leaved and some other evergreens. In fact, now is the time to shield them from sunshine and fierce winds. Let a few cold days come now, with snow on the ground and a bright sun shining, and very quickly Yews, Cunninghamias, Euonymuses will show signs of distress. It is not protection against cold, but against wind and sun, that must be given. Provide straw, sheeting, mats—anything of this kind for large plants, and headless barrels for smaller ones. Branches of Pine or Arbor-Vitæ will prove a help. And now is the time to guard small herbaceous plants from being thrown out by frost and destroyed in spring. The slightest covering of leaves will prevent this. The protective value of a mulch for this purpose can hardly be overestimated.

Germantown, Pa. *Joseph Meehan.*

Iris Bakeriana.—It is about two years since Max Leichtlin, of Baden Baden, enriched the Harvard Botanic Garden with this little gem. Herr Leichtlin introduced the plant from Kurdistan some three years ago. The specimen at this place flowered last spring, and is now again in bloom. It belongs to the spring-flowering, bulbous-rooted section of Irises, of which *I. reticulata* is a familiar example. The cylindrical, or semi-cylindrical leaves (some of them are flattened on one side), barely exceeding six inches in height, are of a pale green color and minutely ribbed. The spathed flower-stalks proceed from clusters of these leaves, each one bearing a single flower of the characteristic Iris form and about two and a half inches across. The fall segments are white, spotted and tipped with rich purple, and feather-veined at the base with lilac; the interior segments of a beautiful soft lilac.

In England this plant grows and blooms satisfactorily in the open air, but its hardiness has not as yet been tested here. The only specimen in the garden is considered too valuable at present for the risks of experiment, and, therefore, it has been grown in a pot under the protection of a frame heated to exclude frost. It is a charming subject for pot culture. The roots should be potted in fall and allowed complete rest during the summer months. I have not been able to detect the Violet-like odor attributed to the flowers. The amount of forcing, however, to which the plant is necessarily subjected under pot cultivation, though in this case reduced to a minimum, may perhaps suppress the fragrance.

Cambridge, Mass. *M. Barker.*

Correspondence.

Orchids at North Easton.

To the Editor of GARDEN AND FOREST:

Sir.—There is now a magnificent display of bloom in the Orchid houses of Mr. F. L. Ames, at North Easton, Massachusetts. Cattleyas and Cypripediums contribute most extensively to this, but many other genera are represented by a bewildering array of species and varieties. An enthusiast would perhaps consider the new Cypripediums, *C. Niobe* × and *C. Calypso* ×, the most interesting plants of the entire collection. They are very beautiful, and the former has often been alluded to in your columns. *C. Calypso* is a hybrid of *C. villosum Boxalli* and *C. Spicerianum*, the latter being the male parent. Some idea of the amount of bloom which this princely collection affords may be obtained from the statement that about 500 racemes are now showing on the Odontoglossums, besides a considerable number already fully developed. There are a considerable number of seedling Cypripediums, Dendrobiums and Masdevallias, from which the gardener, Mr. William Robinson, expects some good things.

One of the best of the small collections of Orchids in the vicinity of Boston is that of Mr. E. W. Gilmore, at North Easton. The greenhouses are situated but a few minutes' walk from those of Mr. Ames, and visitors to one of the places should not miss the opportunity of inspecting the other. Cattleyas, Cypripediums, Odontoglossums and Phalænopses form the largest part of Mr. Gilmore's collection, and his gardener, Mr. Thomas Greaves, evinces a degree of skill in their culture which is rarely excelled. "We attempt only a little here," said Mr. Greaves, "but that little is done as well as we know how to do it." A good example of the utility of this motto is found here in a lot of *Cattleya citrina*, which, after being six years in cultivation, is probably the finest in existence. There are

peculiar difficulties in keeping this pretty species in healthy condition for more than three years after its importation, as every grower of experience knows. The manner in which Mr. Greaves treats his plants is somewhat exceptional. The plants are fastened to little rafts, and arranged so as to leave a vacant space of about one-fourth of an inch between the pieces. This arrangement is decidedly superior to the block or pot system usually practised, for, as Mr. Greaves points out, it reduces to the smallest margin the possibility of water being retained about the plants. In a half-span house with aspect due north these rafts are hung against the back wall as near as possible to the glass. This brick wall is of ordinary thickness, and close behind it, on a level with the plants, there is a series of hot-water pipes, which convey the heat to other parts of the structure, and are, therefore, always warm in cold weather. When the weather is not extremely severe air is given day and night throughout the year, and in winter the requisite tempera- is uniformly maintained by means of artificial heat. Mr. Greaves believes there is a virtue in keeping the foliage dry during winter, and he considers the lodgment of water about the base of the leaves positively injurious at that season. Hence the plants are then watered by being dipped so as to avoid wetting the foliage. In the warm season, however, roots, pseudo-bulbs and leaves are all freely syringed. Under these conditions the masses of extraordinary large pseudo-bulbs develop a most healthful appearance, and almost every growth now gives promise of flowers in abundance.

Cambridge, Mass. *M. Barker.*

The Proposed Monument to General Grant.

To the Editor of Garden and Forest:

Sir.—I agree with your correspondent, Mrs. Van Rensselaer, that credit is due to Mr. Duncan for including the treatment of the ground in his general design. It will be held, however, by some critics that the monument should be adapted to the park instead of seriously modifying the park to suit the monument. Whether the park shall be cut in two and partially obliterated, while the views up and down the river are obstructed by a stone structure for the sake of a flight of steps which few persons will ever feel disposed to climb, is another question. As a matter of practical moment, I should like to be informed whether the Monument Committee has authority to make such changes in the plans of the park as may seem to them desirable.

New York. *A. W. C.*

[Of course, the Park Board is the final authority in such matters. In the regular course of proceeding for such cases provided, permission is asked for the erection of a given structure, and its plans are offered for inspection. These are referred to the Landscape Architect of the Board, as are all matters affecting the design of the parks. Upon the report of this officer the Board will take action. We believe that a design for this portion of Riverside Park has already been adopted by the Board, which contemplates the erection of a mounument and fixes its location.—Ed.]

The Gardens of Wellesley College.

To the Editor of Garden and Forest:

Sir.—There is always something of interest in the greenhouses here, and for the small area of glass very much is accomplished. Mr. Butler, who came here as gardener to Mr. Durant many years before the college was founded, which commemorates his public spirit, has been gardener to the college ever since it was established. No one without experience would imagine how ceaseless are the requirements of such an institution for plants which are of botanical interest only. Mr. Butler is about to begin the germination of seeds, to show the development of the embryos, which are required, in some cases, in two stages, and for two sets of classes meeting on dates furnished him beforehand. It can be easily seen that to have the embryos in the proper stage at certain dates requires very nice calculation. Mr. Butler has therefore prepared a list or diagram, which is a work of art, giving days or hours, as the case may be, which are required to bring the germinating seeds to the proper state of advancement.

Apart from his botanical work, Mr. Butler finds time and space to grow a few plants well, some to be used for decorating the college halls on special occasions, and some for Mrs. Durant's private conservatory. During the summer one will always find some good Fuchsias, Coleus, Caladiums, Gloxinias, Begonias, Achimenes, and a few choice Orchids in bloom. In fall and winter we find Chrysanthemums, small plants, but extremely well grown, Cyclamens, Cinerarias, Primulas, Camellias and Azaleas, which two latter classes of plants have always been his pride.

Ophiopogon Jaburan, var. *variegatum*, is a comparatively rare and interesting Japanese plant, which I saw here on a recent visit. It has stiff, Iris-like leaves and of slow growth, and is nearly hardy. I have known it many years, but never before had the pleasure of seeing its beautiful indigo-blue, drupe-like seed-vessels. The variegation is in stripes, and is really pretty when the new growth is made, but disappears considerably as the leaves age. For botanical purposes it is useful in representing the *Hæmodoraceæ*.

Among Orchids in bloom now are *Cypripedium* (*Selenipedium*) *Stonei*, very finely colored; *Angræcum Lowi*, a very neat little species with pure white flowers, and *Angræcum eburneum*, sent here for *A. superbum*, which Mr. Butler does not believe it is. I had not observed, until my attention was drawn to it, the peculiar double twisting of the fruiting pedicels, which brings the normally superior, but ordinarily inferior, segment of the perianth back to its normal position, giving the flowers a different aspect altogether from Angræcums generally. All the segments of the perianth, including the spur, are green, with the exception of the (in this case) superior one, which is the purest white. It is a very striking species and a robust grower.

Wellesley, Mass. *H. G.*

Lilium Hansoni.

To the Editor of Garden and Forest:

Sir.—Your usually correct correspondent, E. O. Orpet, is slightly in error, I think, in regard to the first flowering of *Lilium Hansoni*. This Lily was first sent from Japan to Max Leichtlin, Germany, with quite a considerable collection, and flowered with him for the first time outside of its native country. Herr Leichtlin sent some bulbs to the late P. Hanson, an enthusiastic amateur of Brooklyn, and named it Hansoni as a compliment to the friend who had sent him all our American species. At least this is the statement, if my memory serves, which Mr. Hanson made to me.

Floral Park, N. Y. *C. L. Allen.*

Recent Publications.

Three Years in Western China.—A Narrative of Three Journeys in Ssu-ch'uan, Kuei-chow and Yun-nan, by Alexander Hosie. Dodd, Mead & Company, New York.

Mr. Hosie undertook the journeys described in this volume as a member of the British Consular Service, and it is the expansion of reports published in the interests of trade. But incidentally it contains a good deal of information which interests students of botany and horticulture, as well as many graphic descriptions of little known tracts of country. The large map upon which his wanderings are marked shows a course where many a botanist would delight to tread in his footsteps; and though his experiences included almost as many hardships in-doors as out, these were naturally less severe than enthusiasts in the cause of science must meet in totally uncivilized countries. The desire of the British Government to open up these provinces to foreigners, was the inspiration of Mr. Hosie's mission; and undoubtedly the cause of science as well as commerce will soon profit by his efforts, while in the mean time his book will show where the botanist is likely to reap rich harvests and how these places may eventually best be reached.

In the valley of the Yang-tsze near Ch'ung-k'ing, he says, "I first made acquaintance with the Poppy in full bloom. Fields of white and purple equaled in number the patches of wheat, barley and rape. Where the flowers had fallen the peasants, principally women and children, were busy harvesting the juice. The tools used in the operation are simple but effective. Towards evening the peasants may be seen moving in the Poppy-fields, each armed with a short wooden handle, from one of the ends of which protrude three and sometimes four points of brass or copper blades, firmly inserted in the wood. Seizing a capsule with the left hand, the operator, with his right hand, inserts the points of the blades near the top of the capsule, and draws them downward to the stem of the plant. From the incisions thus made a creamy juice exudes which gradually becomes of a dark brown color. This is scraped off in the early morning by means of a short curved knife, and deposited in an earthenware bowl, the contents of which are afterward fired or left in the sun to dry. In this way the weight is reduced about one-half, and the opium is

then ready for boiling. The whole process is simple, and may be accomplished by the women and children of the family, thereby permitting the more able-bodied to attend to the other farm duties, thus reducing the price of labor and consequently the cost of the drug. The bleeding of the capsule is continued until the flow of juice is exhausted." At other points Mr. Hosie found still wider fields of Poppy, and describes whole valleys and hillsides as "one mass of Poppies in full bloom—white, mauve and white tipped with pink being the chief colors."

The way in which, in the highly cultivated districts, every acre of ground is utilized is well explained where Mr. Hosie writes of the same valley where he first saw the Poppy: "The remainder of the valley was occupied by Rice-fields, submerged in preparation for the summer sowing. Sometimes they are allowed to soak for months, their surfaces being frequently covered with floating water-plants, which are afterward utilized as manure. They are likewise stocked with fish. In the early spring reeds and rank grass are cut from the hillsides and made up into small bundles, which are then strung on bamboos, laid down in shallow water in the Yang-tsze and weighted with stones. Here the fish spawn, and the ova adhere to the grass and reeds, which are then taken up and sold. The grass is afterward scattered in the higher fields, between which and the lower water-communication is kept up by digging small outlets, which can easily be filled up at a moment's notice. Here the ova are hatched and good fishing may be had after a few months."

Here Mr. Hosie found the Wood-oil-tree (*Aleurites cordata*), "scattered among the fields, seeming to prefer thin-soiled, rocky ground. It grows to a height of about fifteen feet, and has large, beautiful shady green leaves, which were lighted up as we passed with bunches of small pink-white flowers. It produces a large green fruit like an apple, the large pips or seeds of which contain the oil for which the tree is famous." This oil is used for lighting and in various manufactures, but "the seeds, if eaten, cause nausea and vomiting."

In the province of Ssu-ch'uan sericulture is an important industry, and "every homestead where Mulberry leaves are procurable is engaged in it," the work again being carried on by women and children, and markets for cocoons and opium being held in each little village at intervals of five days. Not only the Mulberry, but the Oak, and, likewise, *Cudrania triloba*, furnish leaves for the worms, and the last is believed to be "particularly suited to the infant palate, the silk produced from such a diet being thought superior in quantity and quality." The hemp of this region is furnished by *Abutilon Avicennæ*, and very heavy crops of wheat are produced by planting at intervals of from nine to twelve inches instead of sowing broadcast.

In Kuei-chow and Yun-nan the writer describes the population as scant and lazy, partly because of the mountainous character of the land and the consequent difficulty of transportation. But wars and insurrections in former days have also played their part, and we read of ruined cities, built of substantial stone, where the inhabitants now live in wattled huts, using the floors of the superfluous houses for vegetable gardens.

When approaching the Yun-nan frontier the author met two new crops, Buckwheat and Oats. "I saw, too, a new method of manuring the fields. For some days I had been puzzled to account for the peculiar growth of certain trees whose branches were very short, and for which I could obtain no satisfactory explanation; but all at once I came upon a peasant hacking off the branches and another plowing them into the Rice-fields." When he reached the city of Ning-yuan, in the plain of Chien-ch'ang, he found that but two foreigners had preceded him. This plain is immensely rich, and, in addition to Mulberry-trees, produces "Rice, Poppy, Cotton Safflower, a variety of fruits, medicine and dyes, Cassia, Beans, Wheat and Maize. . . . Pine boards are also a special export from this region. Immense trees are found embedded in the soil on the hills, their positions being discovered from lines of Pine-sprouts. They are dug up, sawn and sent north in large quantities." Here also is the centre of the famous but hitherto little understood "white-wax industry."

Mr. Hosie's third journey was undertaken with the special view of providing the authorities at Kew with information upon this subject. From its results the so-called "Insect-tree" of the Chinese has been identified as *Ligustrum lucidum*, or Large-leaved Privet. The bark of the branches and twigs of this tree are covered with scales containing infant insects—the White-wax insects. In the end of April these scales are collected and carried by porters across the mountains to Chia-ting, made up into paper packets, which must be transported with the greatest care and speed. West of Chia-ting stretches a great plain of Rice-fields, and here "almost every plot of ground . . . as well as the bases of the mountains are thickly edged with stumps, varying from three or four to a dozen feet in height, with numerous sprouts rising from their gnarled heads. These stumps resemble at a distance our own pollard Willows. The leaves spring in pairs from the branches; they are light green, ovate, pointed, serrate and deciduous. In June, 1884, when I visited this part of the country, some of the trees were bearing bunches apparently of fruit in small pods; but as no flowering specimens were then procurable there still exists a little uncertainty as to this tree. I am informed, however, that it is, in all probability, the *Fraxinus Chinensis*, a species of Ash. This tree is known to the Chinese as the *Pai-la-shu*, or 'White-wax tree.'" When they reach the valley the wax-insect scales "are made up into small packets of from twenty to thirty scales, which are enclosed in a leaf of the Wood-oil-tree. The edges of the leaf are tied together with a Rice-straw, by which the packet is also suspended close under the branches of the Wax-trees. A few rough holes are drilled in the leaf with a blunt needle, so that the insects may find their way through them to the branches. On emerging from the scales the insects creep rapidly up the branches to the leaves, among which they nestle for a period of thirteen days. They then descend to the branches and twigs, on which they take up their positions, the females, doubtless, to provide for a continuation of the race by developing scales in which to deposit their eggs, and the males to excrete the substance known as white wax. Whether or not the wax is intended as a protection to the scales I am not prepared to say. . . . The wax first appears as a white coating on the under sides of boughs and twigs, . . . gradually spreads over the whole branch, and attains, after three months, a thickness of about a quarter of an inch." When the depositing is finished the branches are lopped off, as much of the wax as possible is removed by hand, melted in boiling water and skimmed off, when it is ready for sale. Then the twigs and branches are thrown in the pot to secure the remaining wax, and even the insects themselves are squeezed in a bag. It is this method of boiling, of course, which necessitates each year the importation of a fresh supply of scales with eggs or insects. Each wax-tree receives its burden of scales only at intervals of three years. The wax is used in a variety of important ways, and, mixed with tallow, gives much greater consistency to candles, or, used as a coating, prevents their guttering.

We have but culled a few of the most interesting passages from Mr. Hosie's book without attempting to follow him systematically through his wanderings or to describe coherently the character of the many and very diverse districts he visited. To do this thoroughly would have been almost to quote his book entire, so we may conclude by referring our readers to it as a valuable addition to the literature of travel, and a straightforward, interesting account of some of those few regions of the world which, while rich in interest, are still almost unknown to us.

Notes.

The *Revue Horticole* states that Vilmorin & Co. have produced a double hybrid Cineraria, which will soon be put upon the market.

The school children of California are to make a collection of the wild flowers of the state, which will be exhibited at the World's Fair in Chicago.

Mr. C. B. Waldron has been appointed Professor of Forestry and Horticulture in the North Dakota Agricultural College, and Mr. H. L. Bolley, Professor of Botany.

It is said that the Berlin authorities have issued a caution against the use of dried mushrooms, many cases of illness having been attributed to the presence among them of poisonous species.

M. Délaux, well known as an introducer of Chrysanthemums, announces, among the novelties of the year, a collection of early flowering varieties which were highly commended at the exhibitions last year.

According to a report published in *Popular Gardening*, the total shipments of apples from this country to England during the past season and up to date of November 17th amounted to 192,000 barrels, as against 305,000 barrels shipped up to the same time in 1888.

Tom Thumb Dahlias is the name given to a dwarf strain of these plants which have been produced by Mr. Girdlestone, Secretary of the National (England) Dahlia Society. The plants

are only from nine to twelve inches high, and will probably prove valuable additions to the list of bedding-plants.

In a paper on the cultivation of Roses, read at the last weekly meeting of the Massachusetts Horticultural Society, Mr. John N. May, of Summit, New Jersey, said: "Twenty years ago possibly five thousand Roses a day was the limit of supply for New York City; now as many as fifty thousand a day can often be found there, and in the spring of the year the number may reach a hundred thousand a day."

It is reported in the *Popular Science Monthly* that Professor Geddes, of Edinburgh, in consequence of recent investigations, has been led to reject "the commonly accepted views of the origin of thorns. He has found that there is a more or less developed general contrast in vegetative habit between thornless and thorny varieties. The thorny varieties or species show a more diminishing vegetativeness than their thornless congeners; in fact, they frequently develop their thorns by the actual death of their germ points."

In an account of Japanese Pear-orchards, recently published in the *American Garden*, Professor C. C. Georgeson said: "The heaviest item of expense is for the destruction of insects. Using no poisons, and having no spraying-pumps, the work is done by hand. A moth lays its eggs in the flower at the base of the pistil, and the larva is removed as soon as it hatches, before it has buried itself in the young fruit. This is delicate work, and, as I was told, could not be trusted to women and children, who could be had cheaper than men; but the work richly repays the outlay."

French journals state that the great Grape country of Champagne, which as yet has been free from the phylloxera, is now threatened by the dreaded pest. In the commune of Tréloup in the Department of Aisne, and close to the borders of the Department of the Marne, several colonies of the phylloxera have recently been discovered, and although, of course, the most energetic measures of isolation and extermination were at once begun, there is great alarm lest the Marne districts—the great champagne-producing lands—may be infected, as a brisk trade has been carried on by them in the importation of Vines from the now infected village of Tréloup.

In his recently published article on southern California, Mr. Charles Dudley Warner says that the new City of Riverside occupies an area some five miles by three, and that "one avenue through which we drove is 125 feet wide and 12 miles long, planted in three rows with Palms, Magnolias, the *Grevillea robusta*, the Pepper and the Eucalyptus, and lined all the way by splendid Orange-groves, in the midst of which are houses and grounds with semi-tropical attractions. Nothing could be lovelier than such a scene of fruits and flowers, with the background of purple hills and snowy peaks." Yet in 1872 there was only a "poor sheep ranch" where this city of some 6,000 inhabitants now stands.

A "Flower-girls' Guild" was established not long ago in London by certain charitable ladies with a view to improving and cheering the lives of the many girls who sell flowers in the streets at all times of the year. The first step was to provide the often half-clothed girls with warm dresses and bonnets, which are of a special cut and color—gray, trimmed with scarlet—as the idea of a "uniform" is, in England at least, attractive to all members of the poorer classes. Water-proof cloaks for stormy weather were also provided, and in a building set apart for their use they find dressing and washing rooms, and a cool, well-ventilated place in which to store their flowers at night. In the future a sick-relief fund will be established as well as evening classes and entertainments.

At a recent meeting of the Massachusetts Horticultural Society the Harvard Botanical Garden sent a flowering specimen of *Hippeastrum aulicum*. This species was introduced to cultivation from Brazil in 1810, and is interesting chiefly as being one of the plants employed to produce by hybridizing and crossing the splendid varieties of this genus now in cultivation. The flowers of *H. aulicum* are red, green and purplish, between six and seven inches across, with the edges of the segments more or less incurved. When compared with those of some recent varieties they show clearly the improvement which has been made in these plants. The flowers of the variety John Ruskin, for instance, measure from eight to nine inches in width, with broad, flat, imbricate segments. The shades of color have been increased in recent forms to a wonderful extent, and in most cases these shades lack that coarseness which is found in many of the original types.

Over 1,000 persons met in the hall of the Museum of Natural History on Saturday at the call of the New York State Forest Association. Morris K. Jesup, the President of the Association, was in the chair, and effective addresses were made by Honorable Warren Higley, Assistant United States Treasurer Ellis H. Roberts, A. W. Gleason and Rev. Dr. Lundy, President of the Pennsylvania Forestry Association. William Potts, Chairman of the Executive Committee of the Association, offered resolutions to the effect that it is essential for the state to have absolute control over enough of the wilderness to preserve the sources of the streams which rise therein, and that until this control is established the Legislature should take measures to minimize the destruction of the timber in this region. To this end it was urged that laws be enacted to prohibit the building of railroads over state lands and the building of dams which should cause the overflow of these lands, and for increasing the efficiency of the state control in preventing forest-fires, in punishing trespassers, in rewooding denuded lands and introducing practical forest-administration. The resolutions were seconded by Ex-President Cleveland, who counseled moderation in asking for appropriations, and suggested the expediency of gaining the co-operation of clubs and other property-owners in the Adirondacks. The meeting was altogether the largest and most enthusiastic one ever held in this state in the interest of forest-preservation.

"Never throw away a morsel of an Orchid-plant capable of growing until it has flowered, even if you are obliged to wait for years for this event." Such is the advice which Monsieur G. Miteau gives in a recent issue of *Le Journal des Orchidées*, basing it on his own experience, which he tells as follows: "Four years ago, when I began to cultivate Orchids, one of my friends gave me a lot of small bits of a large number of species. Among them were some so miserably small and unpromising that my friends advised me to throw them away, declaring that I should be forced to wait ten years without seeing a flower, even if they ever flowered at all. Among these scraps of plants was a little bit of *Lælia purpurata*, whose life appeared to hang by a thread. I do not know why I did not follow my friends' advice and throw these miserable specimens away. I did not do it, however, and the first year my *Lælia purpurata*, which had been condemned by the Faculty, produced a little shoot and a minute bulb. The second year it produced two bulbs stronger than that of the preceding year. At last, the third year (it was not to flower for ten years at least), it produced four flowers from a comparatively strong bulb, and produced a second shoot strong enough to lead me to hope for two flower-shoots the following year, and now it turns out that the variety is a remarkable, new and beautiful one. I exhibited it at one of the meetings of L'Orchidéenne, and it obtained a certificate of merit of the first class, receiving the name of *Lælia purpurata*, var. *Nolisi*. Some of the other bits flowered before the Lælia, some at the end of the year, others not until a year later. All the others are in good condition, and will doubtless flower next year."

Catalogues Received.

Bradley Fertilizer Co., 27 Kilby Street, Boston, Mass.; Oranges and Vegetables in Florida.—Alfred Bridgeman, 37 East Nineteenth Street, New York, N. Y.; Vegetable, Grass and Flower Seeds.—W. Atlee Burpee & Co., Philadelphia, Pa.; Vegetable and Flower Seeds, Thoroughbred Stock.—J. L. Campbell, West Elizabeth, Allegheny County, Pa.; Eureka Incubator and Brooder.—Clarence C. De Puy, Syracuse, N. Y.; All About Broilers and Market Poultry Generally.—R. Douglas & Sons, Waukegan Nurseries, Waukegan, Ill.; Wholesale Catalogue of Hardy, Ornamental Evergreens.—S. H. Garrett, Mansfield, Ohio; The Garrett Fence Machine; Small Fruits, Fruit Trees, Shrubs, Vines and Ornamental Trees.—Chas. A. Green, Green's Nursery Co., Rochester, N. Y.; Small Fruits and Fruit Trees.—Haage & Schmidt, Erfurt, Germany; Novelties in Bulbs.—William Baylor Hartland, 24 Patrick Street, Cork, Ireland; Flower and Vegetable Seeds.—Hitchings & Co., 233 Mercer Street, New York, N. Y.; Dwelling-Heating by Hot Water.—J. T. Lovett Co., Little Silver, N. J.; Flower Seeds, Small Fruits, Fruit and Ornamental Trees.—Hugh Low & Co., Clapton Nursery, London, E., England; New and Desirable Plants.—Orlando Nursery, Orlando, Fla.; Orange-trees and Sub-Tropical Fruits.—W. Piercy, 89 West Road, Forest Hill, London, S. E., England; Early and Late-flowering Chrysanthemums.—Rea Brothers, Norwood Nurseries, Norwood, Mass.; Trees, Ornamental Shrubs, Roses, &c.—Storrs & Harrison Co., Painesville, O.; Vegetable and Flower Seeds, Small Fruits.—James M. Thorburn & Co., 15 John Street, New York, N. Y.; Flower, Vegetable, Grass Seeds.—James Vick, Rochester, N. Y.; Flower and Vegetable Seeds.—Whitman Saddle Co., 118 Chambers Street, New York, N. Y.; American and Imported Saddles.—T. W. Wood & Sons, 8 and 10 South Fourteenth Street, Richmond, Va.; Grass, Vegetable and Flower Seeds.

GARDEN AND FOREST.

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The Adirondack Reservation.

THE meeting held in the Museum of Natural History ten days ago at the call of the State Forestry Association surpassed in numbers and earnestness any similar gathering heretofore held in this city or state. This evidence of a strong and growing popular sentiment is gratifying, because it is the only power which can compel appropriate forest-legislation or enforce forest-laws after they are enacted. The people are slowly learning that they have in their forests a possession of inestimable value, and they are awakening to the truth that their preservation is essential to the national well-being. They are beginning to realize, too, what all experience has proved, that forests in private hands are certain to deteriorate even in countries where their value is recognized, where the proper methods of managing them are understood and where men schooled and skilled in the practice of forestry can be secured to take charge of them. If the remnant of the North Woods which still stands is to continue to do the beneficent work of preserving the streams that flow out of them, and ministering to the health, comfort and prosperity of our citizens, the state must ultimately take charge of them. The state, with its continuous life, its comprehensive concern for the good of all, its ample capital, its purpose which can be held steady from generation to generation, can alone be trusted to administer this property to the highest advantage of the community.

But how and when, and within what limits, the state shall acquire the fee of these forests, are questions of expediency which need ample discussion. The State Commission have prepared one or more bills for the establishment of a park, which we have not seen at this writing. The State Forestry Association are preparing other bills. Certain clubs are advocating still further legislation. It is not intended here to examine these proposed measures or to pass judgment on any of their provisions, but simply to say that in many particulars these provisions clash, and they cannot all be right. Whether the state is to buy the entire tract at once and outright, or to invite clubs and individual owners to retain their proprietorship under such conditions of management as it provides for its own forests; whether it is to buy land and leave the privilege of cutting timber to lumbermen or to work the woods itself and make the profit on its forest-products offset the interest on the bonds issued for the purchase of the park; whether railroads are to be stringently prohibited from entering the reservation or admitted under restrictions; all these and a hundred more questions must be faced. Meanwhile, as the demand for the park grows stronger, the owners are raising prices, and a million dollars of purchase-money will buy only a tithe of the land it would have bought twenty years ago.

Some manifestations at Albany are not such as to encourage the hope that an immediate or satisfactory adjustment of these important matters is probable. The State Commission has been charged with inefficiency and with subordinating public interests to personal ends. On the other hand, the Governor, who appointed the Commission, is said to be plotting to undermine its influence for political purposes. Let us hope that both charges will be proved baseless. But, while there is investigation and recrimination, confidence languishes. Before great sums of money are appropriated there should be absolute faith in the integrity, the public spirit and the business capacity of the agents who are to use it. It is a good time now for the people of the state to let their representatives know that they are expected to give their best thought to these problems and make some genuine progress, even if it is slow. If but few steps are taken, let them be made in the right direction—steps which will not need to be retraced.

One thing, at least, our legislators should bear in mind. The state should show itself competent to take care of the lands it already possesses while it is preparing to acquire more. Not another week should be allowed to pass without the enactment of a measure to prohibit the construction of any railroad across the state lands. The building of any dam which may cause the overflowing of state land should be forbidden with equal promptness. When these laws are passed and more stringent measures are taken against fires and trespasses upon its own lands, the state can ask with greater assurance for the enlargement of its property.

OF the extravagant methods which prevail in the United States none certainly exceeds in extravagance that under which the turpentine industry of the south is conducted; and there is no business connected with the products of the soil which yields so little return in proportion to the destruction of material involved. Mr. W. G. Cooper, in discussing in a recent issue of the *Southern Lumberman* the forest-wealth of the state of Georgia, calls attention again in a forcible manner to the lamentable results which have always followed the manufacture of turpentine in this country. The Pine-forests of Georgia once represented fabulous wealth; they were not surpassed by those of any other region, and could they have been wisely husbanded would have made Georgia one of the richest states in the Union. Mr. Cooper estimates that of the $400,000,000 worth of pine now standing in them, forty per cent., or $160,000,000 worth, have been killed by the turpentine-farmers, as the men are called who tap the Pine-trees. There are, it is said, stills enough in operation in the state to use up the remainder of the timber in seven years; and yet all that is paid for the privilege of destroying the value of the trees is seventy-five cents to a dollar an acre, or $5,000,000 for the destruction of forests which in fifteen years of good management might, it is safe to say, produce $150,000,000 worth of lumber and naval stores without seriously diminishing their productiveness. The men who carry on the turpentine industry do more damage than the lumbermen. The latter leave small trees, generally all those which do not measure ten inches across on the stump. The turpentine-farmers, however, take every-

thing they see, big and little, and once the resinous surface of the tree is exposed, fire is almost certain to finish the damage the axe of the turpentine-farmer has commenced.

It appears from a recent investigation made of the area and condition of the Georgia Pine-forests that 266 turpentine stills are in operation in the state. The farms necessary to supply one still will use up 15,000 acres of timber in three years, and it is believed, at the present rate of operation, that the Georgia Pine-forests would be ruined in twelve years even if a single acre had not already been boxed. But as four-tenths of the trees have been boxed, seven years, at the present rate the destruction is going on, will steal away, Mr. Cooper believes, the life of every Pine-tree in Georgia. It is only necessary to examine the condition of the Pine-forests in eastern North Carolina, where the turpentine industry was first established and has thus been longest practiced, to realize the effect it has on our forests, and the soundness of Mr. Cooper's views. Wilmington, which was once the most important shipping-point in the world for naval stores and the principal shipping-point for southern hard pine, has now lost entirely its commercial importance as a point of distribution for forest-products, the North Carolina Pine-forests being no longer a considerable or even an important factor in the country's supply.

The erection of the Battle Monument to be placed at West Point near the verge of the beautiful bluff whence one looks northward upon the river, has been entrusted to Messrs. McKim, Mead & White, of this city, after a competition, in which the judges were Mr. R. M. Hunt, of New York, and Mr. Arthur Rotch, of Boston, architects, and Mr. St. Gaudens, sculptor. Messrs. McKim, Mead & White, in the memorandum presented with their drawing, said:

"In preparing the design, we have most carefully considered the object of the monument and the site which it is to occupy.

"We believe the monument should be first and foremost a martial one, distinctive in its character and impressive in its design. The beauty of its site and the surroundings seem to us to preclude any bulky or massive treatment, and to suggest rather a treatment where the impression should be produced by height supported by a base which should not interfere with graceful and artistic treatment. For this reason, we have adopted as the feature of our design a single monolithic shaft treated in the shape of a memorial column or column of victory. This form seems to us to be more distinctively martial than any other, and in this form we believe it is possible to obtain impressiveness and dignity without a sacrifice of grace, at the same time preserving a distinctively architectural and monumental character. We lay great stress upon these two points—namely, the necessity of giving the monument a martial character and the relation of the monument to its site. In our design we have had these two points continually in mind with results which you must judge. The shaft is a monolith of polished granite forty-six feet high and five feet six inches in diameter. To the best of our belief it would be the largest polished shaft in the world. It is proposed to surmount it with a figure of Victory and surround it by eagles—a distinct mark of its national character. The shaft rests upon a circular base surrounded by flights of steps, giving the greatest dignity possible to the base. The materials are the most enduring—granite and bronze.

"The estimate for the cost of the monument assumes an expenditure of $50,000 in addition to the value—$5,000—of certain bronze cannon donated for the purpose by the Goverment. It is hoped that the monument will be completed during the course of the coming summer."

The other competitors were Messrs. Babb, Cook & Willard, of New York, whose design showed a Doric column of polished granite, surmounted by a bronze figure, and set upon a raised platform with exedras on two opposite sides; Mr. W. R. Emerson, of Boston, who proposed a triumphal arch of white marble, flanked by a colonnade, and resting on a platform; and Messrs. Carrère & Hastings, of New York, who again proposed a columnar shaft. Their memorandum said (and the point they raise is worth noting in view of the very lofty proportions of the column designed by Messrs. McKim, Mead & White): "In our opinion, on the site chosen, with no background other than the sky and distant scenery, whatever the character of the monument may be, its seeming proportions will so change—apparently lessening in diameter without lowering in height—that it will need some kind of decorative background between it and the landscape. Moreover, while the height of a classic column of such an order as we have studied, if introduced into a building, should be equal to nine diameters, we are persuaded that, standing by itself, it should have seven and a half diameters, and this fact is illustrated in many examples, conspicuously in the Column of Trajan, in Rome, and in the Columns Vendome and La Bastille, in Paris. To illustrate further the principle of having something between the monument and the landscape: a monument in a public square, amid buildings or other surroundings, reveals its true proportions and looks better than it would in a large park. We have, therefore, suggested a decorative colonnade as shown on plans. The shafts of the columns and piers, as also the friezes of this colonnade, would give the space asked for in the programme, to receive the names of the officers and non-commissioned officers who fell in the war."

Dahlias in Mexico.

Heeding the suggestion of an English botanist, I gave, on my latest journey in Mexico, the home of the Dahlia, special attention to this genus, and for the effort was well rewarded as usual. Two new species were brought to light to be added to the half-dozen already known and in the hands of cultivators. These are *Dahlia pubescens* and *D. dissecta* of Watson.

D. pubescens was found on calcareous bluffs of prairies bordering the valleys of small streams in the state of Mexico and to the north of Toluca. The plant struck me at first sight as very distinct in habit from the species I had frequently encountered, the parents of most of our garden varieties; for it is smaller, only one and a half to two feet high, and more strict, the leaves, pinnately parted with narrower and more numerous divisions, being, like the fewer branches, more erect. This strict appearance is further increased by the flowers being held vertically by erect peduncles. The flowers are two or three inches broad, with a yellow disc surrounded by about eight rays, which are purple, with lines of deeper color, but change with age to light purple or dull rose. The tubers are comparatively small, only one or two inches in length, and vary from round to oblong in shape.

D. dissecta was discovered growing on limestone ledges of mountains fifty miles east from San Luis Potosi. It is a very unique species, being scarcely more than two feet high and of bushy habit from an almost woody base. Its leaves are bipinnate, sometimes tripinnate, with numerous divisions only one or two lines wide, smooth, dark green and somewhat fleshy. The flowers are raised above the foliage on peduncles a foot long; they are two or three inches broad with about eight mauve-colored rays. All my breaking up of the rocks, in whose seams the roots of this plant were hidden, failed to bring to view any tubers; doubtless, it is only to be propagated by seed and by division of the perennial branching base, from which arise the very leafy annual flowering branches. Owing to its peculiar habitat this must be a very local species.

Working southward from the boundary slowly and somewhat carefully, I have as yet only reached the latitude of the capital at various points within the states of Mexico, Michoacan and Jalisco; hence I have so far met with only two of the old species of Dahlia, *D. coccinea* and *D. variabilis*, those earliest known and most varied and combined under cultivation.

Of these *D. coccinea* has the more northerly and by far the most extensive distribution. From the Cordilleras of Chihuahua, within 200 miles of the United States Boundary — probably much nearer, and possibly within the limits of the United States on the Chiricahua Mountains of Arizona—it ranges southward through the mountains to Jalisco in a purple flowered variety, and was seen again in the adjoining state of Michoacan in a yellow variety. On the eastern side of the country, also, it was found from the mountains of Coahuila to those surrounding the Valley of Mexico. On this line the colors shown were scarlet varying through orange to lemon yellow. The size of its flowers in the wild state varies from two to three or four inches in breadth, and the stature of the plant from three to six feet or more. Its habitat has been given as "sandy meadows" (probably the alluviums of streams was meant), but I have rarely seen it growing except in the thin, dry soil of ledges—even in the crevices of bare ledges—or (quite commonly) among the broken rocks which form, with a little soil, the talus of cliffs, either mountain walls or cañon walls. A sight of its bright flowers is cheering to the

collector when he is struggling with the difficulties of such situations as these.

D. variabilis was not met with until I had reached the state of Mexico. On the sides of ravines among the foot-hills of the mountains that rim the Valley of Mexico it was seen in abundance and perfection, a royal plant, coloring the slopes with its profuse purple blooms. Many of the flowers measured five inches in breadth. The height of the plants varied from three to six or eight feet. Near by, but far less abundant, *D. coccinea* was growing on the bluffs of streams, the plants here showing the largest development. It added interest to these two plants, as I admired them, to reflect that it was from this vicinity, quite likely, that seed was obtained a little before 1789 to send to the Botanic Garden of Madrid, and again in 1804 by Humboldt. Amidst the enterprise of the present century it seems incomprehensible that the Spaniard, who admires all things that are beautiful, should have been in Mexico 270 years before sending home plants so striking as these.

Walking among these wild Dahlias day by day, admiring the symmetry of their single flowers and the rich contrasts of scarlet and gold displayed by the disc and rays of the one, and of purple and gold shown by the other, the aversion which the botanist feels for the monstrous forms of flowers produced in gardens was intensified in me; and it was with much satisfaction that I learned afterward that single Dahlias are now receiving far more attention among cultivators than double ones. As yet, however, it is only the older double sorts that are seen in Mexican gardens.

After improving this large opportunity to study these two species in their wild state—and probably these are the two most closely related of all which botanists have recognized—I marveled at the audacity shown by the late Mr. Shirley Hibberd when he declared at the Dahlia Show held at Chiswick last autumn that, in his opinion, there was no good ground for admitting more than one original species. If he should be able to refer *D. coccinea* to *D. variabilis*, could he so dispose of such extreme species as *D. imperialis* or *D. scapigera*, not to mention this new *D. dissecta?*

Charlotte, Vt. *C. G. Pringle.*

Plant Notes.

Prunus ilicifolia, var. occidentalis.

THE relegation of the plant to its proper place seems to have been attended with some difficulty, and as regards the authority for the name under which it first appears there has also been more or less question by botanists who have lately noticed the species. So far as I know, Mr. W. S. Lyon published the first account of the plant in the *Botanical Gazette* (xi., 202, 333) in 1886, referring it to *Prunus occidentalis* of Nuttall, a name which cannot be found, and very probably was never used by Nuttall, and if at all, as Professor Greene has fitly remarked, Nuttall would more likely have used it under Cerasus, holding, as he did, the sections of Prunus, as now understood, to be separate genera.

Professor Greene gives the next account of this plant in his "Notes on the Botany of Santa Cruz Island" (*Bull. Cal. Acad. Sc.*, ii., 7,395, 1887) under *Prunus occidentalis*, and failing, as others have, to find that the name was of Nuttall, properly cites Lyon as the authority.

The next mention is by Mr. T. S. Brandegee in his "Flora of the Santa Barbara Islands" (*Proc. Cal. Acad. Sc.*, ser. 2, i., 2,209, 1889), where it appears as *Prunus ilicifolia*, Walp., var. *occidentalis* (Lyon) (=*P. occidentalis*, Lyon). Professor Sargent (Garden and Forest, ii., 400) approves the disposition of the plant in relating it to *Prunus ilicifolia*, and advises that Mr. Brandegee's name be taken up, although very properly adding that *occidentalis* is nevertheless unfortunate, in view of the West Indian species, which bears the same name.

It appears now, however, that the term *occidentalis* is no longer tenable in its application to this plant, either in the rank of species or variety, as, in 1800, Swartz applied it to a West Indian species of this genus ("Fl. Ind. Occ.," ii., 925), a fact which should preclude its further use in the case of our California insular variety, and hence leaves this plant without a name.

I have thought best, therefore, to designate this variety as *Prunus ilicifolia*, var. *integrifolia*.

The following characterization of this variety is drawn chiefly from Professor Greene's remarks (*l. c.*) under *Prunus occidentalis*, Lyon:

Leaves evergreen, glossy, three to four inches long, two to two and a half inches broad; mostly ovate-acuminate, rarely lanceolate-acuminate, and three inches long by three-fourths of an inch broad, sometimes broadly ovate and abruptly acute, with spinose-serrate margins, usually entire or remotely denticulate. Inflorescence racemose, flowers white. Fruit dark red-purple, orbicular, three-fourths of an inch in broadest diameter, slightly compressed laterally and with a well-marked suture on one side; pulp thin, sweet, with bitter almond flavor. Fifteen to twenty-five feet high, bark rough and dark colored, crown compact and well rounded.

As occurring on Santa Cruz Island it is described as resembling a large bush with several trunks from the same root; while on Santa Rosa a single trunk sometimes reaches a height of fifteen feet before branching. Mr. Brandegee mentions a large tree near San Francisco with a diameter of more than two feet, and that in the Santa Inez Mountains it reaches six inches in diameter.

Professor Greene adds that the narrow-leaved form is only occasional, and that the spinose-serrate foliage belongs chiefly to young trees.

Mr. Lyon (*l. c.*) states that in parts of Santa Catalina Island this tree is characteristic and conspicuous in its beauty, occurring on the interior mountain ridges at 3,000 feet elevation, as well as in the rich valleys and cañons to the water's edge. Professor Greene reports it from Santa Cruz Island, where Mr. Brandegee examined it, as well also as on Santa Rosa, where it is confined to the bottoms of cañons.

Washington, D. C. *George B. Sudworth.*

New or Little Known Plants.

Viola ocellata.

THIS pretty Violet (Fig. 13, p. 55) is closely related to our common eastern Canada Violet (*V. Canadensis*). It is a native of California, where it is found growing under the shade of the forests of the coast ranges from the northern borders of the state to Monterey. It has the leafy stems of its eastern relative, and very much the same habit of growth, and the same cordate, pointed, serrate leaves. The petals, however, instead of being white faintly tinged with violet, as in that species, are more gaily colored. The two upper are white on the inner surface and deep purple-brown on the outer, while the others are yellow veined with purple, the two lateral with a purple spot near the base and slightly bearded on the claw.

*Viola ocellata** has been known to botanists for a long time. It has not probably, however, been often cultivated, although well worth a place in those gardens in which plants with pretty and delicate flowers are valued.

Juglans Vilmoriniana.

THE tree whose portrait appears in the illustration on page 53 was planted as a young seedling by my grandfather in his garden at Verriers, near Paris, as a memorial of the birth of his oldest son. Nothing is known of its origin. It is supposed, however, to be a hybrid between the European Walnut and the American Black Walnut. Such, at least, was the opinion of the late Dr. Engelmann, and his conclusion seems fully sustained by an examination of the characters of the tree. The branches are more upright than those of the European Walnut. The bark of the trunk is grayish, with regular vertical rather remote furrows; that of the two to four-year-old branchlets is dark brown and smooth, the young shoots being slightly pubescent near the buds, and the color of Florentine bronze. The buds are enclosed in brown, somewhat fleshy, hairy scales. These characters are almost intermediate between those of the European and of the Black Walnut. The leaves and the fruit are intermediate in character, too, between the supposed parents. The leaves of *Juglans Vilmoriniana* are usually composed of five pairs and a terminal leaflet, the last being somewhat larger than the others. They are ovate, slightly coriaceous, smooth, dark green, and remain on the branches until killed by frost. On the whole, the leaves resemble those of the English Walnut, but with one or two additional pairs of leaflets and

**Viola ocellata*, Torrey & Gray "Fl. N. Am." i., 142.—Hooker & Arnott, "Bot. Beech," 325.—Brewer & Watson, "Bot. Cal.," i., 56.—Gray, *Bot. Gazette*, xi., 291.

with a slight difference in their shape. The fruit, which is not produced every year, and never in large quantities, is smooth. The shell of the nut (figured below) is thicker and more deeply furrowed than that of the European species. The fruit germinates well and produces plants resembling the parent. The original tree has grown very

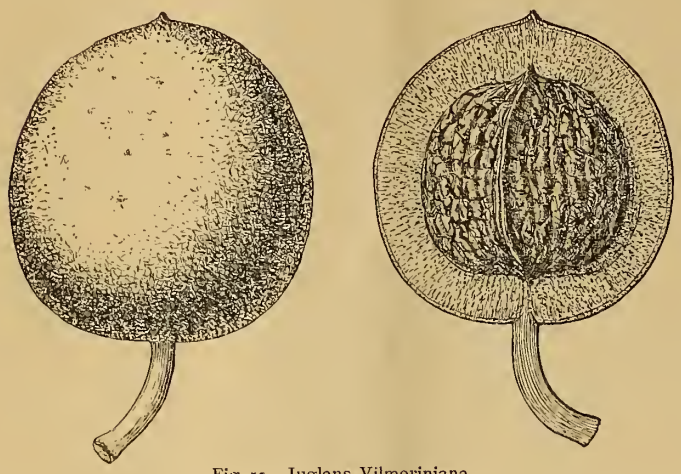

Fig. 11.—Juglans Vilmoriniana.

fast, and, although not more than seventy-three or seventy-five years old, is now seventy-five to eighty feet high, with a trunk-diameter of forty inches three feet from the ground.

Of the few seedlings which have been raised from this tree one is growing beautifully at Segrez, in the Arboretum of Monsieur Lavallée, and produces fertile nuts. All the seedlings have grown thriftily when planted in deep sandy soil mixed with clay.

Is it to be supposed that the fine tree at Verriers is the first-born of its race? So it would appear from the fact that no older specimen is known. Is it probable, however, that the planter would have selected a tree to commemorate an important event in the family history, and to occupy a specially favorable location, unless he had some idea of what it would become in time? Were its peculiarities and value known to him? To this there is no clue. It is not, however, customary in France to plant the European Walnut as an ornamental tree in parks and gardens, and it is more probable that this particular tree was planted for a Black Walnut and selected from a lot of seedlings as being larger and stouter than the rest, a chance cross having caused these conditions. This, perhaps, is the least improbable hypothesis of the origin of *J. Vilmoriniana.*

Paris. *M. L. de Vilmorin.*

Foreign Correspondence.

London Letter.

Hollyhocks.—These noble border plants are attracting considerable attention amongst English cultivators. Mr. Douglas' interesting paper upon them, read before the Royal Horticultural Society in August last, and noticed in Garden and Forest in September (p. 454), drew public attention to them, and a paper on the best varieties by Mr. George Steel in this week's *Journal of Horticulture* is certain to do much toward creating a reaction in England in favor of the Hollyhock as a garden plant.

Twenty years ago the Hollyhock was as popular as the Dahlia is now, and it was not until the appearance of the destructive Fungus (*Puccinia malvacearum*), which destroyed many collections, and appeared to make the cultivation of the Hollyhock almost hopeless, that the plants lost favor. A prospect of overcoming the attacks of this pest by means of various simple remedies, such as soot, lime, Condy's Fluid and weak solutions of sulphate of potash, makes it less formidable to growers than it was a few years ago, and next year will probably see the Hollyhock reinstated among the most popular of summer-flowering plants.

Mr. Steel has been to considerable pains in obtaining, by means of a sort of census among Hollyhock fanciers, a return of the best kinds now in cultivation. Altogether he has no less than 400 named varieties recorded. Of this number, however, only fifty-two are included in his select list, from which I take the first dozen, placed in their order of merit as shown by the returns:

Grace Darling (rosy salmon), Robert Ryle (carmine-red), Maggie Bain (rosy peach), F. G. Dougall (rosy purple), Le Grand (salmon-flesh), John Findlay (vivid crimson), Lord Decies (dark crimson), Mrs. G. Steel (peach, shaded rosy salmon), Agnes Ryle (yellow, stained carmine), Perfection (silvery flesh), Queen of Yellows (bright yellow), Alba superba (pure white).

While many of the florists' ideal varieties of Hollyhock are such as would be admired by the less-exacting horticulturists, I may say a word in praise of common seedling single-flowered kinds. In a garden attached to my house there has been for the last three years a large clump of a single-flowered, rose-colored kind which pushes up annually at least a dozen stems, each about seven feet high, and for at least half their length clothed with flowers. This clump gets no special treatment, yet it grows vigorously and knows nothing of the fatal Puccinia. No doubt the highly bred kinds are exceedingly delicate. They are all the progeny of one species, namely, *Althæa rosea*, a native of Asia Minor.

Phrynium variegatum.—Writing to the *Gardeners' Chronicle*, Mr. Ridley, Director of the Botanic Gardens, Singapore, states that this plant, which M. Linden distributed a few years ago under the above name, has long been in cultivation in Singapore, where it is known as *Maranta arundinacea variegata*, or the variegated Arrowroot. It was obtained by M. Linden's collector from the Singapore Botanic Gardens.

Crossing Chrysanthemums.—I have repeatedly read of the production of so-called hybrids from garden Chrysanthemums, but I have never yet seen one that could not have originated as a seedling sport, uninfluenced by any foreign pollen whatever. I see you have in America also growers who profess to be able to cross one variety with another with certainty. I wonder how it is done? Can any one take, say, Queen of England and Edwin Molyneux, and produce from them a true cross, or would not seeds from either produce all kinds of variations or sports? Mr. A. Forsyth, who was a great raiser and distributer of Chrysanthemums, said, eighteen years ago: "Permit me, in all sincerity and politeness, to say that hybridizing the Chrysanthemum is fudge. Take your seed as you get it, and with it take your chance of the crossing Nature has accomplished for your benefit, but do not suppose that any one less gifted than a magician can manipulate the flowers of the Chrysanthemum with the certainty that we operate on the flowers of the Geranium and Fuchsia." There is much talk here of "intelligent crossing," "judicious selection of the varieties to be operated upon," etc., but much of it means no more than the assurance of the raiser of hybrid Ferns that he "effected a cross by carrying the two kinds of spores mixed in his pocket."

London. *W. Watson.*

[There is much truth in this criticism, and in many cases there is no foundation for the claim that the parentage of a new Chrysanthemum is absolutely known. But this is equally true of many other hybrid and cross-bred garden plants. And yet it is not safe to assert that there can be no assurance of pedigree in given instances, even of cross-bred Chrysanthemums. A few American experts make use of devices and appliances which seem to reduce the uncertainty to a minimum. We hope to give an account of the most approved practice in this direction in an early number.—Ed.]

Cultural Department.

Experiments in Treatment of the Diseases of Plants.

The reports of experiments made in 1890 in the treatment of diseases of plants at the several stations which are directed by Professor B. T. Galloway, Chief of Division of Vegetable Pathology, United States Department of Agriculture, may not be published until late in the spring of 1891. Meanwhile a synopsis of the results of work at the Vineland, New Jersey, station may be of immediate interest.

The experiments made at Vineland were chiefly directed to comparing the values of various solutions of copper in their use as preventives of fungous disease. If it is learned which is the best of these solutions, this one can be recommended for general adoption. It is probable, however, that there is no universal remedy, and yet it is important to know

Fig. 12.—The Original Specimen of Juglans Vilmoriniana.—See page 51.

definitely the various specifics for the various plant-maladies which need to be prevented or cured. Copper is one of these specifics. It is more generally antidotal to the Fungi which cause injury to plants than any element hitherto tried. In France some years ago the discovery was accidentally made that sulphate of copper is preventive of many Fungi injurious to the Grape. This is verified by repeated experiments in the United States, and it is further learned that other preparations of copper are also fungicides. For prevention of the mildews of the Grapevine I have in 1890 tried with satisfactory results the carbonate of copper and the acetate of copper.

What is known as the Bordeaux Mixture still proves to be the most reliable preventive of the Black Rot of the Grape.

The formula of this mixture has been widely published, and should be generally known, yet I have so many letters of inquiry concerning it that it may be well to print the recipe again: Take six pounds of copper sulphate, pulverized, and dissolve it in sufficient boiling water, and six pounds of unslaked lime, dissolved in cold water. Four gallons of hot water is enough to dissolve the sulphate, and six gallons of cold water is enough to slake the lime. When the two solutions have cooled mix them, and dilute this mixture with cold water enough to make twenty-five gallons of the liquid in all. Mix well, then let the mixture rest for a few minutes, so that the coarser particles of lime may settle. Then draw off the superincumbent liquid (which will resemble milk of lime) for use in the spraying machine. When used in spray this liquid should carry with it its chemical contents—that is, the mixture must be kept stirred. The treated plant after it is sprayed with the mixture should appear as if thinly whitewashed. This whitewash after it has dried or "set" will remain on the plant quite persistently; more so on the fuzzy surface of leaves than on the smoother skin of the grape. I have seen the Bordeaux Mixture applied in June yet visible on Grape-leaves in November. The health of these leaves was thus preserved through the season. For protection of the grapes from the Black Rot the spraying should be repeated about every two weeks, according to the weather. If a heavy rain falls soon after a spraying this should be repeated as soon as possible.

The cost of spraying a vineyard is small in comparison to the value of a full crop of protected grapes. I can point to a vineyard in southern New Jersey of some thousands of Concord-vines which, sprayed every ten days, carried a sound crop of fruit full twenty pounds to the vine, while adjacent vineyards were ruined by the Black Rot. These protected grapes were worth to the owner, a wine-maker, fully six cents a pound. The cost of protecting them was about four cents a vine.

The quantity of lime for the Bordeaux Mixture was formerly put at four pounds; I suggest six pounds, to be surely on the safe side. A surplus of lime can do no harm. If there is not enough lime to decompose the copper sulphate the mixture will injure the plant. I had last June an instructive experience as to this. In the hurry of preparation of sundry casks of copper solutions, we carelessly used in making the Bordeaux Mixture only four pounds of water-slaked lime. This quantity is equivalent to scarcely two pounds of fresh lime—hardly half sufficient to neutralize the acid of the copper sulphate. With this faulty mixture I sprayed some 400 vines when they were in bloom. The next day I saw that on these vines my spraying had destroyed all the blossoms and all the foliage! This costly lesson disposes me to suggest the prudence of testing all mixtures, which may contain matters hurtful to vegetation, on a few plants before making a general application. Prepare fungicides and insecticides some days previous to the time when they are to be used and try them on a small scale until sure that they are right.

There is no danger attending the use of the ammoniacal solution of carbonate of copper. The formula for this is: Three ounces of the carbonate, two quarts of aqua ammonia (twenty-six degrees) and fifty gallons of water. The copper carbonate will soon dissolve in the ammonia, after which the solution is mixed with the water.

As a fungicide I used, in 1890, with very encouraging results, a solution of two and a half pounds of acetate of copper in twenty-five gallons of water. In prevention of potato blight and rot this is as good as the Bordeaux Mixture. I cannot judge of its efficiency against grape-rot, because that section of the vineyard subjected to the copper acetate was stripped of grapes by the Rose-beetles.

All of the solutions of copper mentioned seem sufficiently preventive of Grape-leaf mildews. Here the efficacy of the copper is complete. All of the treated vines held their foliage green and healthy until frost. The leaves of the vines not treated were destroyed by mildew by the last of August.

A solution of copper highly recommended by the Delaware Experiment Station is, to thoroughly mix in half a pail of water one pound of carbonate of copper, to which is added three ounces of common glue dissolved in hot water. Then dilute to twenty-five gallons. It is reported that this mixture had no action on the foliage, was easily prepared, and gave remarkable results at a time when the rot was making rapid progress in the vineyard where it was used.

The Delaware Station recommends also the following preparation: Mix together three ounces of carbonate of copper and one pound of pulverized carbonate of ammonia. This mixture will entirely and quickly dissolve in a couple of quarts of hot water, when it can be diluted to fifty gallons. The cost of materials for fifty gallons of this mixture is twelve cents.

As the infection of Black Rot must be prevented, but cannot be cured, it is needful that treatment of the vine must begin early in the season. In spring, before the buds swell, spray the vine thoroughly with a solution of one pound of copper sulphate in twenty gallons of water. Then, not later than the middle of May, just before the vine blooms, spray with the Bordeaux Mixture; again in ten days, and then at intervals of two weeks until about the last of July. The last two or three sprayings may be with the carbonate of ammonia and copper mixture, in order to avoid the whitewashing of the fruit consequent on late use of Bordeaux Mixture.

Contrary to the experience of others, I have not succeeded in controlling Anthracnose on a variety of Grape-vine peculiarly afflicted by it with any of the copper solutions. I fail also to find any fungicidal value in solutions of sulphate of iron.

The Pear-leaf blight (Entomosporium) and that of the Quince are fully prevented by timely sprayings with Bordeaux Mixture.

Of the copper solutions used in the summer of 1890 for prevention of Potato blight and rot, the Bordeaux Mixture and the acetate of copper give decidedly the best results. By spraying the Potato-plant every two weeks with either of these solutions it will be effectually defended against the Fungus which causes the rot. In very rainy seasons and in very wet locations it may be difficult to keep the Fungus from blighting the Potato-tops. Such was the case with me this last fall. Nevertheless, although the tops blighted before maturity, the tubers were saved from rot in those sections of the field treated with the Bordeaux Mixture and with the acetate. The rest all blighted and rotted badly.

Vineland, N.J. *A. W. Pearson.*

Plant-houses for Amateurs.—I.

EVERY one who is interested in flowers is almost certain, as winter approaches, to wish for some proper shelter for his plants. If much interested he dreads the long season of cold weather, when the plants housed in makeshift quarters will require much attention, and make little, and that unsatisfactory, growth. Window gardening, even with carefully selected plants, entails a vast amount of labor, and there are always many plants to which the atmosphere of an ordinary house heated with a furnace and lighted with gas or oil is fatal. Not every household is willing to adapt its doings to a windowful of plants. Usually, where means are at command, a greenhouse or a conservatory is soon added to the grounds of the village or country dweller who cares for flowers, and many times added simply as a fashionable luxury. But the ordinary grower of limited means hesitates at the mention of a greenhouse as involving great expense in construction and maintenance. This is an erroneous idea; for a plant-house can be erected at a very small expense, quite within ordinary means. As with most things, the necessary parts are inexpensive, and it is only by the addition of ornaments and fanciful work—luxuries—that the cost is made formidable. The horticultural papers have published article after article on small greenhouses, year after year, and yet such houses are far from common, while it would seem that a large proportion of the owners of gardens would erect such houses and enjoy them were the facts clearly understood.

My notes probably will add little to the general information, but may interest some one else who finds recreation among growing things. My small house, which faces north and south in one corner of the garden, is not without its faults—like all first attempts at building—but proves a good working house for my requirements, which are sufficient space, light and heat to winter over tender stock, to grow and flower plants and bulbs, with a space for propagation and seed pans. It also provides "the den," necessary to most men, where confusion may reign without the danger of a revolt in the household.

The house is a span roof with seven-foot ridge eighteen feet by eight feet (a width of nine or ten feet would be better, and would cost only a trifle more). It is covered with sash for fifteen feet and boarded for three feet over the furnace. The lumber cost within a few cents of twenty-five dollars, the sash twenty dollars, the paint, etc., perhaps five dollars; in all fifty dollars for materials. The labor bill will depend somewhat on one's own handiness, or the activity of the builder, who will do the erecting in two or three days. The side-walls are of hemlock boards, covered with building paper, and faced with patent sheathing boards, which answer capitally to keep out cold. The heater, pipes, etc., suitable for such a house, ready for screwing together, may be had for fifty dollars cash, so that an expenditure of $100 to $110 will furnish one with a small plain house, quite large enough for an amateur gardener who is engaged during the day in other occupation. If larger,

Fig. 13.—Viola ocellata.—See page 51.

the care is apt to become a burden sometimes, and it is much better to start with a small house and long for more space, than to have so much to water, etc., that pleasure changes to disgust. The heater is the article which gives the pause to many people desiring a greenhouse; and various arrangements are constantly recommended and said to work perfectly. The hot-water apparatus, with furnace, pipes and expansion-tank, is in general use by florists, and as it is a commercial matter with them it may be concluded that what they use is the most desirable for the purpose. The first cost is rather more than other fixtures, but a base burner gives out heat quite uniformly, will burn with slow combustion a long time without attention, and by the pipes a uniform heat is distributed through the house. Their fault seems to be that they are wasteful in radiating heat from the outer surface, as this is lost in the furnace-room. However, the stove can be jacketed and water in pipes thus kept hotter. In my case the surplus heat tempers an adjacent frame. My house has a single two-inch flow and return, and, though not at all air-tight, is rather overheated.

Elizabeth, N. J. *J. N. Gerard.*

Cypripedium venustum.

ALTHOUGH by no means a large-flowered species, *Cypripedium venustum* is an object of much attraction during the winter months. From December until February, and even later, this pretty Lady's Slipper will be met with in flower, occupying a prominent place in the Orchid-house as much on account of its beautifully marbled foliage as for its flowers. The latter appear generally singly on an erect scape, six to nine inches high, but it is not unusual to see two flowers on one scape. The white upper sepal is broadly cordate-acute and conspicuously striped with bright green, while the much smaller lower sepal is pale green, with darker green veins. The bearded petals are dark green at the base, with some blackish purple spots near the edges, and the apical portion is dullish purple, the entire length being traversed with dark green veins. The lip reminds one very much of an inverted helmet; it is small, yellowish green, but nicely netted with dark green veins, and sometimes washed with purple, while the basal incurved lobes are of a shining tawny yellow, with numerous small spots or warts. Great variation exists among the flowers as regards coloring, some forms being much more highly colored than others, owing no doubt either to geographical or cultural differences. The two varieties known in gardens as Pardinum and Spectabile are, however, the most distinct, and may always be recognized by deep coloring and beautiful markings on the lip.

The discovery of *C. venustum* is due to the well-known Indian botanist, Dr. Wallich, who met with it in north-eastern India, and had plants sent to be cultivated in the botanic gardens at Calcutta. About 1819 plants were obtained from the botanic garden and introduced to England, where it met with a favorable reception. Since this time it has been imported in quantity on several occasions by enterprising nurserymen, whose chief desire, however, is not so much for the typical plant as for its more attractive varieties.

The cultivation of this species is very easy. An intermediate house, with a temperature varying from fifty-five to sixty degrees Fahrenheit in winter to sixty to seventy degrees in summer, will suit it admirably, with plenty of light. The compost should consist of rough peat and sphagnum moss, and during the period of growth water may be given in liberal quantities, but at other times must be given sparingly.

Isleworth, London. *John Weathers.*

Color in Conifers.

IT is noticeable that the public interest in the multiplied varieties of conifers has greatly increased within a few years past. Especially has this been true in the case of the Silver Firs and Spruces. At the present time there is a large demand for the light colors of *Abies concolor* and *Picea pungens* to contrast with the darker shades of *Abies Nordmanniana* and similar kinds. Nor is this in any way surprising when we consider the striking effects which are produced by grouping trees of differing shades of color, which retain their beauty throughout the year. To one unfamiliar with these conifers it will be a revelation to witness how completely a winter landscape, even in our northern latitude, may be transformed into a garden of color.

But it is objected that in the case of some of the kinds most desirable on account of color, this characteristic is lost as the tree attains age. At a recent discussion before the Massachusetts Horticultural Society the opinion was expressed that *Picea pungens* would soon lose its popularity, because of the unreliability of its color even with the best selected trees. The fact was stated that in its home on the mountains the forests of this Spruce have lost the silvery sheen of young trees. This is not the case with *Abies concolor*, which retains its glistening gray foliage even to old age. But we must not be hasty in our judgment of *Picea pungens*. In the first place, it is to be considered that to a great degree the beauty in color and form of many conifers is confined to their youth and middle age. Stately specimens of mature age are, indeed, magnificent. But we may well be satisfied if we can secure results which will continue for twenty-five or perhaps for fifty years.

And again, I think there are numerous indications that this quality of color is to a considerable extent within our control. An observer who has visited the forests of northern New England, especially on the coast of Maine, will have noticed the fine color of our native White Spruce. It delights in a cool, moist climate. The Balsam Fir is also at its best in such localities. In a hot and full exposure these trees lose this distinctive coloring. I have had young seedlings of *P. pungens* planted in a warm, sunny place, which became almost without exception of a uniform green. It was very apparent that the position was too hot and too sunny and the soil too sandy for them to develop the glaucous color. A marked improvement has been noticed upon transplanting them to a cooler western slope and into a good loamy soil. So many instances have been observed that I think we may lay down the rule that rich color depends largely upon culture. It is well known that Rivers' Purple Beech, when it is a large tree, requires feeding. Left to an impoverished soil its foliage becomes a dull bronzy green. But a generous feeding will restore it to its early color. The same principle applies to conifers. It is a fact that where well-rotted manures have been applied the colors have been restored. The secret of the remarkably distinct color of some notable trees near Boston is from the fact that they have an abundant supply of compost or cow-manure. Specimens of *P. pungens* twenty-five or thirty feet high are of the richest shining silver and show no signs of change. Give the tree good treatment and it will retain its beauty for years.

And it may be added that the luxuriant effect of conifers is surprisingly enhanced by a judicious application of fertilizers. It is an exploded idea that evergreens will not bear feeding.

Waban, Mass. *William C. Strong.*

Some Useful Acanthads.

ERANTHEMUM PULCHELLUM.—Those who grow a mixed collection of plants would find this free-flowering species very serviceable in winter. It is not common in cultivation, though known since 1796, when it was introduced from the East Indies. It branches freely, but is, nevertheless, of compact habit. The opposite leaves of deep green are elliptical, pointed at the extremity, and narrowed at the base to a short petiole. The flowers are borne in short terminal and axillary spikes. The tube is narrow and an inch in length; the limb an inch in diameter, spreading abruptly, and divided into five oval segments of bright blue color. The calyx divisions are white, insignificant, and covered by the conspicuous bracts, variegated green and white. Blue flowers are nearly always scarce in greenhouses, and it is, therefore, desirable that a plant which produces them abundantly in winter should be known to every one.

PERISTROPHE SPECIOSA.—In a warm greenhouse this plant is extremely prolific of its pretty flowers during the winter and early spring months. It is a native of the East Indies, and was introduced to the notice of gardeners in 1826. The plant is of an erect, free-branching character, with opposite, ovate-acuminate, pale green leaves. The flowers proceed singly or in pairs from the axils of the leaves which clothe the little branches at the top. The narrow twisted tube is about an inch in length, and the limb consists of two broad but slightly shorter segments, one of which is thrown backward, while the other opposite protrudes or droops slightly. A reddish purple color prevails, and the upper segment of the limb is spotted with dark purple at the base. It is a very attractive plant. *Justicia speciosa*, though now considered generically erroneous, is a much commoner name for this species.

STROBILANTHES ISOPHYLLUS.—Although deficient of the showiness which characterizes the subjects generally grown by florists, this plant deserves notice as one worthy of a prominent place in those private gardens where easy contrasts of color give more satisfaction than glaring effects. It was introduced from Sylhet in 1845. But the nurserymen have never given it much attention, and thus the plant is seldom met with

in any but botanical gardens. Those who visit such institutions during its flowering season agree in praising it, and they usually note the name with the intention of securing a specimen. But the venders of plants seldom keep it, and the search for it ends with the first disappointment. It is a plant of neat, bushy growth, with dark green lanceolate leaves. The bell-shaped flowers are over an inch in length and three-fourths of an inch in width at the mouth. They are of a pleasing lavender shade, and appear very freely in winter. This plant was formerly known as *Goldfussia isophylla*, and it is also occasionally referred to under the generic name, Ruellia, an allied genus.

These three plants can be grown to full perfection very readily—a quality which renders them fit subjects for amateurs—and the directions for the propagation and culture of one will suffice for all. It is advisable to propagate annually in order to obtain the most decorative specimens. The tips of the young branches, in the form of cuttings, root quickly in heat at any season of the year. But it is best to propagate in spring, so that the plants may have a proper season of growth previous to the flowering period. Transfer the plants to pots singly when thoroughly rooted; grow them on in pots until the weather becomes sufficiently warm to permit of their being hardened off, and plant them in the open garden early in June. With a free supply of water during prolonged terms of drought they will thrive luxuriantly in ordinary garden soil. They must, however, be taken up not later than the latter part of August and potted, using a compost of rich loam and leaf-mould, with a small percentage of sand. They may remain outside, taking care to give them a shady position and plenty of water for a few days after potting, until about the middle of September, when they should be placed in a cool greenhouse. Increase the temperature of the house gradually as the weather grows colder, until it reaches the intermediate limit, and maintain a tolerably dry atmosphere when the plants are in bloom.

Cambridge, Mass. *M. Barker.*

New Hardy Herbaceous Plants.—Of late some splendid novelties in this class of plants of Asiatic origin have been added to my collection. *Arnebia macrothyrsa* much resembles *A. echioides*, but the individual flowers as well as the cluster (thyrsus) are much larger, the latter having often a diameter of nearly a foot and consisting of some forty golden yellow flowers. *Onosma albo-roseum*, a low herb with numerous gray, hairy, lanceolate leaves and hundreds of bell-shaped flowers, is a very striking plant. The flowers resemble those of a Corea or a *Brodiæa coccinea*, and when opening are white, changing through every shade of rose and red to become finally blood-red. *Papaver glaucum* is also a splendid novelty, bearing numerous large flowers of a dazzling crimson, the sepals forming a regular pouch, which only opens in bright sunshine. Another Poppy not yet named has numerous comparatively small minium-red flowers, which are remarkable because some twenty-five of them are united in an umbel. *Tchihatchefia isatidea* is a plant whose flower-spike rises from a rosette of hairy, dark green leaves, and shows a compact spike thickly set with numerous purple flowers. Some showy species among hardy bulbous plants are growing here, but of these I must report when more ample material is before me.

Baden-Baden. *Max Leichtlin.*

Chrysanthemums.—Success with these flowers depends upon care given to the stock-plants during winter as much as upon after-treatment. It is essential that cuttings should have a good constitution to start with. Last year I kept my stock-plants in the Violet pit, and was convinced that a light, airy, dry and cool place just suited them. This year I am growing Carnations in the Violet pit, which requires to be kept at a temperature too high for Chrysanthemums. I had perforce to prepare fresh quarters, and this I did by partitioning off a part of a deep pit and putting a false bottom in it, which I barely kept frost-proof. The plants made no growth until I took them into the greenhouse about a fortnight ago. I can now get good, strong, healthy cuttings, the rest apparently having imparted vigor to them. The plants are rooted with a little bottom heat, although this is not essential; but cool air overhead is important, so that a drawn or unnatural growth is prevented.

Wellesley, Mass. *T. D. H.*

Nematodes Attacking Bouvardias.—Spots of a dead brown are developing on the leaves of Bouvardias in the greenhouses near New York, and these are followed by a wilting and drooping of the whole plant. Microscopic examination of these lifeless spots reveals no Fungus, but multitudes of minute worms. In one greenhouse examined I observed that the white sorts of Bouvardias had escaped entirely, while the pink varieties growing with them were badly affected. This may be only accidental, that is, not a peculiarity of the varieties, but due possibly to the fact that the white sorts came from one soil and the pink ones from another. Coleus plants were usually associated with the Bouvardias examined. The leaves of these were also blotched, and in the browned spots nematodes were abundant. The fact that the Coleus is subject to attacks from these eel-worms was stated in GARDEN AND FOREST some months ago, but I have not seen the Bouvardia mentioned among the list of plants infested by them.

Rutgers College. *Byron D. Halsted.*

Correspondence.

Notes from Brookline.

To the Editor of GARDEN AND FOREST:

Sir.—In going through greenhouses attached to old places around Boston, it is interesting to note the large number of tender and half-hardy specimens of evergreen plants stored away for use in the summer on lawns and in flower-gardens and other appropriate places. During a recent visit to the greenhouses of J. L. Gardiner, Esq., among plants kept for such purposes I noted fine examples of *Myrtus Ugni*, the variegated *Eurya Japonica latifolia* and *Coprosma Baueriana*, *Ficus acuminata*, together with Grevilleas, and some of the hardier Palms, like *Phœnix reclinata*, *Livistona humilis* and *Chamærops excelsa*. Stored away in pits, or what might be termed sunken greenhouses, were found plants which are hardy in England and the south of Europe, such as Hollies, Japanese Evonymus, Caucasus Laurels, Portugal Laurels and Yews. These pits are also used for storing Indian Azaleas, Cytisus, Boronias, and many other hard-wooded plants. As the conditions of temperature are nearly uniform, there is very little to excite the plants into growth before spring, and for this reason they are much better adapted to this purpose than structures above ground. It was gratifying to note some uncommon hard-wooded plants for the culture of which Mr. Atkinson has a well-deserved reputation. Although it is generally conceded that Heaths will not endure our dry and torrid summers, yet here we find excellent home-propagated and home-grown plants of *Erica hyemalis*, *E. Wilmoriana*, *E. melanthera*, and the easier grown, yet elegant, *E. gracilis* and *E. codonoides*.

Special attention has lately been paid to *Boronia megastigma*, which forms an elegant little bush, although it is chiefly valued on account of the agreeable perfume of the flowers. Last season Mr. Atkinson planted them out, and for this purpose a number were cut back rather severely. They made strong, clean growths, far healthier than those kept in pots, and now are blooming equally well. *B. heterophylla* is probably a little more attractive than the preceding, but as it possesses scarcely any perfume, it is not so desirable.

Eriostemons are Australian plants which have been grown here many years and deserve more general culture. There are several species in gardens, all making neat bushes, and flowering freely with ordinary attention in a cool-house during winter. The flowers are borne solitary, as in *E. buxifolium*, or in twos or threes in the axils of the leaves, as in *E. myroporoides*, which is the species here grown. They are pink or white in color, with a profusion of stamens and unanthered filaments, giving the flowers a tassel-like appearance. These plants are grown in a composition of peat and loam in pots, well drained. During summer they are placed in a somewhat shady place until autumn, when they are removed to one more sunny in order to get the growth ripe and buds well set.

The advent of the beautiful hybrid Hippeastrums several years ago has not altogether displaced the humbler, yet lovely, Vallotas and Nerines. I noted in a cool-house another and uncommon South African bulbous plant, *Veltheimia viridiflora*, having dense spikes, about one foot high, of small, tubular, red, yellow and green flowers.

The roof of the Water Lily house is covered with some interesting and beautiful climbers, two of which are American plants. The Cherokee Rose is not yet in flower, although the buds were visible all over the roof. The roots are outside, the plant being trained through the wall. In bloom now, also, is *Gelsimium sempervirens*. This is a lovely, sweet-scented climber—the Yellow Jasmine of the South—and one which ought to be grown wherever a suitable position can be found for it. The flowers are sulphur yellow, funnel-shaped, about one inch long and half an inch in diameter, borne on short pedicels, two to three in the axils of the leaves,

and when trained as it should be, it is really beautiful with its festoons of flowers. In the tropical plant house was a plant of the exceedingly bright and showy *Ipomœa Horsfalliæ*, evidently grafted on the tubers of some other species, probably the Sweet Potato, *I. Batatas*. *I. Jalapa* was a species of great interest to the late Dr. Thurber, of Passaic, New Jersey, chiefly, I believe, on account of associations. This is a lovely plant when grown where it can mature sufficiently early in the season to bloom before frost. We planted every spring and stored the tubers in the fall, but it seldom bloomed until frost came to blight it. *Toxicophlœa spectabilis* I found, and large specimens well bloomed are really beautiful. The flowers are borne in umbellate corymbs, clear white in color and powerfully scented. Here, also, I saw some admirable Poinsettias. They were very vigorous, some having made growths of between five and six feet during the last season, with a spread of bracts measuring twelve to nineteen inches in diameter. The secret of taking vigorous shoots in July and August and rooting them without losing any foliage to speak of does not seem to have been discovered here. I have seen it done, however, and nothing is more striking than a group of Poinsettias, the foremost plants of which are not more than eighteen inches high, with leaves right down to the pots, which are often not more than five inches in diameter, with heads of bracts six to eight inches across.

Among Orchids particularly noteworthy were large specimens of *Phajus grandifolius*, always well done here. This is a magnificent plant, the spikes of bloom measuring three feet high, and as many as twelve to fifteen in a twelve-inch pot. Of the handsome *Cattleya Percivaliana* there were some fine varieties. The deep color of the flowers is conspicuous, and especially the orange-yellow of the interior of the labellum. There was also a deeply colored form of *Lælia autumnalis*, with good specimens of *Cypripedium insigne*, *Odontoglossum Rossii majus* and many more Orchids.

Wellesley, Mass. *H. G.*

Meetings of Societies.

The Western New York Horticultural Society.—I.

THE thirty-sixth annual convention of this body, which took place at Rochester last week, was one of the largest and most successful ever held, notwithstanding the fact that last year was one of very general failure in the fruit crop. Mr. S. D. Willard, the first Vice-President of the Society, in his annual address alluded to the general disaster which befel orchards and vineyards, and yet he spoke hopefully, and called attention to the fact that fruit-growers were more thoroughly equipped to-day than ever to meet with the trials which come from bad seasons and the attacks of insects and diseases, and he predicted that the era of low prices was about to give place to more prosperous times. Mr. Willard spoke with feeling of the late President, Mr. Patrick Barry, and noticed the death of two or three other prominent members of the Society which had occurred during the year. Two hundred and eighty subscriptions for membership were made, and, although there were no prizes offered, an admirable display of fruit, especially pears, apples and grapes, was made. The officers appointed for the following year were: President, W. C. Barry; Vice-Presidents, S. D. Willard, W. Brown Smith, J. S. Woodward and George A. Sweet; Secretary and Treasurer, John Hall.

As usual, the addresses and discussions were practical and pointed, and the reports of the various county committees were full of instruction. Abstracts of some of the more important papers are given below:

DO VARIETIES RUN OUT?

This was the subject of a paper by Professor Bailey, which we reproduce entire:

"Few questions have occasioned more discussion than this, and few have been so imperfectly answered. At the present time there are the most diverse opinions concerning it, but with a strong trend toward the negative side; and yet the affirmative of the question admits of almost mathematical demonstration.

"If we define our propositions we shall see immediately that two or three separate questions have been mixed up in this discussion. By "running out" is meant the disappearance of the characteristics of any variety. It does not mean that the line of succession, the series of generations, actually becomes extinct, but that the sum of attributes by which we are able to identify the group of individuals has become so modified that we no longer recognize it. Running out, therefore, is not necessarily deterioration, although the two are commonly confounded; it is simply change, modification. If we say that the Peachblow potato, for instance, has run out, we simply mean that it has disappeared. It has broken up into many forms, perhaps. We cannot say that it has degenerated, for degeneracy is a relative term, and a variety or an individual which is inferior for one purpose may still be superior for some other; and it is probable that there are many different grades or kinds of variations in the remnants of the variety, some poor, some good.

"Again, running out does not mean that the life of the variety is necessarily limited in duration. As a matter of philosophy, we are safe in assuming that the duration of any particular form of life is prelimited, for there is evidence that species have become extinct. Yet, as a matter of practice, the limits of the genetic duration of species and varieties in nature concern us little; and, at any rate, there is no reason to suppose that varieties possess necessarily a different limitation from species. The presumption is, however, as Dr. Gray long ago pointed out,* that the older the variety, that is, the greater the number of its generations, the greater must be its chances of permanence, because it has become pronounced in its character and has proved its capability to persist. But I propose to limit the present discussion to the mere disappearance of varietal characteristics by which we lose sight of the variety, rather than to extend it to the philosophical question as to whether varieties, like individuals, become old and die or wear out.

"My proposition and the proof of it are simply these: Running out is the disappearance of varietal characteristics through change; all plants vary or change, therefore varieties must tend to run out. While there can be no doubt of this general fact or law, there are still degrees of running out, because no two plants vary in the same way or at the same rate—that is, as there are diverse kinds of variation so there must be diverse kinds of running out. The causes of running out are therefore as numerous as the causes of plant variation, and they include all such considerations as the influences of soils, climates, methods of culture, attacks of fungi and insects. It is necessary, however, to distinguish from this the disappearance of varieties through mere fashion, which often banishes varieties which are in every way well marked.

"We can divide variation into two general groups, seed variation and bud variation. Seed variation may be called a progressive tendency, because the new forms or variations are generally different from their ancestors, and possess a greater or less tendency to perpetuate themselves. The seed grower is obliged to exercise constant vigilance to keep his stock "true." He knows that, as a rule, stock is more likely to remain true on poor soils than on very rich ones, because on the latter it tends to sport or "break" more. Dwarf peas soon become half dwarfs upon strong soils, and they possess a tendency to perpetuate their characteristics. These are instances in which soils cause running out. Climate exerts wonderful effect upon vegetation. Transfer northwards dwarfs plants and induces co-ordinate changes. Dent Corn, taken far north, after a time becomes flint, as has been shown by the experiments of Beal and others. And Beal observes† that in southern Michigan Dent "ears grow shorter, kernels become shorter and rounder at the ends." Some plants possess a strong tendency toward variation which appears to be in a measure independent of surroundings. The tomato is a good example; varieties do not long retain their original characters. It is probably impossible to find in the market to-day the Tilden tomato as it was known when the variety first appeared. And the Trophy has changed considerably from its original self. In short, the very fact that we can improve varieties by good culture and that we are enabled to obtain new varieties at all, is indubitable proof that varieties run out. Upon this fact depends all possibility of advance in the origination of varieties, and upon this general law, also, hangs the whole framework of evolution.

"Bud variation comprises all change which comes through the agency of grafts, cuttings and tubers. By grafting or cutting we simply multiply the original plant—we do not take offspring from it—and we have every reason to expect, what all observation shows, that propagation by buds should give a

* *New York Tribune*, Dec. 8th, 1874. Reprinted in the *American Journal of Science and Arts*, and Sargent's "Scientific Papers of Asa Gray."

† Rep. Mich. Bd. Agr., 1876, 113.

less variable result than propagation by seeds. And yet there are instances in which plants do not come true from cuttings or grafts. As a philosophical question, the presumption is that varieties propagated by buds wear out sooner than those propagated by seeds, for the experiments of Darwin and others have shown that the special office of seed propagation is to increase the vitality of the species through cross fertilization. It must follow, therefore, that in the absence of cross fertilization vitality must be less.*

"But as a matter of practice we do not need to consider this phase of the question, for we are concerned with variation rather than with ultimate longevity. And it is also probable that any tendency toward weakness through lack of fertilization is fully counterbalanced by protection which such varieties receive under cultivation.

"The question comes simply to this: If buds are taken from parts which possess stable characteristics they will give stable products under similar conditions. But if the buds are taken from parts which have been developed into abnormal conditions, and which tend to vary, they must tend strongly to depart from the parent, especially when the means by which the high development was produced and is maintained are removed. Bud variation may therefore be said to be indeterminate. The best example of running out in plants propagated by buds is the potato. It is a matter of general observation that varieties of potatoes disappear. And Beal† has performed experiments which show that in eight years varieties which gave good crops so far ran out as to produce nothing. These varieties were grown in the same garden throughout the experiment, but they were constantly shifted over an area of from five to eight acres, so that potatoes were not grown two seasons upon exactly the same ground. And during the time when these potatoes were decreasing in yield the garden was each year producing better crops of other kinds, and the newer varieties of potatoes did well. In this case it may be argued that the plants showed signs of wearing out rather than running out by variation, but there is no evidence to show that the plants were in any way weaker or less able to perpetuate themselves after they had run out than before, for it is probable that seed production increased as tuber production decreased. At all events, we cannot determine if the varieties wore out, so long as we have no record of their seed production. It seems, rather, that the plants returned to a comparatively tuberless condition. Large Potato-tubers are abnormal to begin with, and it is not strange if their characters are transitory.

"At present I see no reason for supposing that fruits propagated by buds run out so long as equal conditions of culture and soil fertility exist; but if the buds were to be taken from parts which are abnormally or unusually developed, as they are in the potato, I should expect that we could not long hold the offspring to their assumed character.

"The conclusion of the whole matter is simply this: Varieties grown from seeds tend to vary or run out. Varieties grown from buds tend to remain permanent, or nearly so, unless the parts which are propagated possess abnormal, or what we might call fictitious or unstable, characters, in which case further variation or running out may be expected."

BACTERIA AND GREEN MANURING.

Professor Caldwell delivered an unusually instructive address on this subject. About four-fifths of any crop plowed under is water; one-fiftieth of it, or what would remain after burning, is called ash, and the rest is organic matter which mostly comes from the air. There are twelve pounds of this in every hundred of the crop turned under, and this addition to the soil improves it in many ways. In the first place, it adds humus, which makes the soil more porous and warmer, and is a constant source of carbonic acid, which does good work in making soluble the food already in the soil. Besides this, it has been clearly demonstrated by recent research that organic matter in some kinds of plants contains much nitrogen, the costliest of plant foods, which it has gathered from the air. The crops which are known to have this faculty are Clover, Peas and other leguminous plants. On the roots of these plants are nodules formed by bacteria, and somehow, in the formation of these swellings, the free nitrogen of the air in the pores of the soil is taken up by the plant. It has been proved that Peas or Lupins will grow in sand which is entirely free from nitrogenous food of any kind if there is only added to the sand a sufficient quantity of the other constituents of plant food with some of the bacteria to secure the nitrogen. Professor Caldwell concludes as follows:

"But the bacteria have still another part to play in the preparation of green manure in order to convert it into assimilable food for the following crop. Green vegetable matter is not food for plants. It must first undergo decay, or, to use a less elegant phrase, it must rot. Now another set of bacteria come in here and carry on this work of decay. They live and multiply in the green vegetable matter, and in connection with their life and growth this matter is converted into humus. There is still another valuable piece of work done by the bacteria besides making the humus, which is the conversion of the nitrogen into nitric acid, or the very important process of nitrification.

"For the best results, then, in green manuring, take for your crop some leguminous plant, such as Pea, Bean, Vetch, Clover, Lupin, Alsike, or others, and select the one that will give you the largest quantity of green matter before the middle of August at the latest. Have your soil well drained and fertilize it well with phosphate and potash, buying no fertilizer that is claimed to contain any nitrogen. For if such a claim is made you have to pay more for manure on that account, and one of the objects of your green manuring is to get your nitrogen for nothing. Plow the crop in even by the 1st of August if you have the ground well covered with a luxuriant growth by that time. Avoid plowing it in deep, and, if practicable, loosen up the ground before the cool weather sets in. This is just the sort of treatment required for putting in a grain crop. Soon after this crop is turned in the bacteria will begin their arduous labors of humufication and nitrification.

"Finally, let me give an account from one of the German journals of the successful use of green manuring in a vineyard. On a German experimental vineyard thirty-five pounds of clover-seed (*Trifolium incarnatum*) were sown per acre, with Thomas' phosphate added for mineral fertilizer. The roots of the plants from a small plat were carefully taken up, and found to be well covered with tubercles. The gain in nitrogen was estimated to be about 118 pounds to the acre. This would have required 20,000 to 25,000 pounds of stable manure for the same quantity of nitrogen. The whole cost of this crop was about 126 marks, while the cost of the stable manure to accomplish an equal result would have been 200 to 300 marks."

DISEASES OF THE GRAPE IN WESTERN NEW YORK.

A carefully prepared paper on this subject was made by David G. Fairchild, of the Department of Vegetable Pathology at Washington. What he said in reference to the various mildews, rots and anthracnose, with their remedies, it is not necessary here to repeat. These matters have been already treated in this journal. We present, however, some facts in reference to a new disease of the grape, which may prove a serious matter in our vineyards:

"About the 1st of September, 1890, complaints reached the Department from numerous localities through western New York of a disease which was threatening the grape in that region. Specimens were received from various parties, and, although carefully examined, revealed no parasites upon them. Accordingly, although so late in the season that many of the vineyards had been touched by the frost, an examination was made of numerous vines in different localities through the infected region, and notes taken of the varying conditions under which the disease appeared. From a study of the trouble in October the following diagnosis may be made: The leaves first show the disease manifesting at the outset irregular, somewhat star-like red blotches between the veins, which gradually enlarge and run together, at the same time becoming browner until they fill up the spaces between the main veins with a deep red-brown tissue, giving to the leaf a pronouncedly striped appearance. This striped look is quite characteristic and may often be seen from a distance of several rods. Upon those vines diseased the berries are of an insipid flavor, often intensely sour, and drop from their stems in the later stages on the slightest touch. Badly diseased veins may often be distinguished by the layer of shriveled berries covering the earth beneath them.

"The trouble is not entirely confined to cold, heavy soils, although apparently worse upon such land, nor is it connected, so far as can be ascertained, with the use or absence of any fertilizers. The shade which is afforded by the foliage of trees and by houses, although in one or two cases seeming to afford protection, cannot be surely connected with it. Examinations of the roots of many diseased and healthy plants, while revealing the fact that the young fibrils had almost entirely rotted away in the diseased ones and were only partially decayed upon the healthy ones, have shown no parasite of a nature adequate to cause the injury. In some respects the disease resembles that which lately appeared in California and threatened the grape interest of that state, and until one or both are more fully worked out must stand in the same general category.

* See also Gray, *l. c.*
† Rep. Mich. Bd. Agr., 1876, 111.

"Comparing it with the descriptions of the French malady known as Rougeot, it is found to possess many points of resemblance, and the eminent French viticulturist Viala, who noticed this disease in his recent journey in the United States, thought that it was probably the same. In the judgment of this authority, Rougeot follows as a concomitant a sudden lowering of the temperature in mid-summer when the vines, loaded with fruit, are in full growth, and is much more likely to occur upon heavy, ill-drained soils than upon light, well-drained land. Both Viala and Foix recommend as the surest prevention against its attacks thorough underdraining. If the wood has failed to mature, and enough bearing wood cannot be secured to furnish good healthy canes, the wisest plan will be to prune close to the ground and raise an entirely new growth.

"Although considerable time and attention has been paid to the class of diseases to which this new malady probably belongs, the prime cause is not positively known, and until a longer time for experimental research is afforded the trouble must remain only partially explained."

Notes.

The fifth annual Orchid show of Messrs. Siebrecht & Wadley will open on the 4th of March at Madison Square Garden.

An exhibition of Orchids will be held at the nurseries of Messrs. Pitcher & Manda, Short Hills, New Jersey, from the 9th to the 14th of February.

A German journal reports that a horticultural establishment in Brussels has already received "much more than $20,000 from the sale of plants of the recently introduced *Cattleya Warocqueana*."

Gartenflora reports that *Pachystima Canbyi*, a rare shrub of the southern Alleghany Mountains, is in cultivation in the public gardens at Münden, in Germany, and endures the winter weather well, although it makes growth very slowly.

The first greenhouse in Chicago was, says the *Prairie Farmer*, erected by one Samuel Brooks in 1840. It was a lean-to structure about fifty feet long by twelve feet wide. Part of the house is yet standing in that city. Perhaps the Chicagoans will place it on exhibition at the World's Fair.

Statistics prove that the horses of England haul on an average twice as much as American horses. This is not due to the superiority of English horses, but of English roads. We cannot afford to build good roads, it is said, but we are compelled by this failure to keep two horses to do the work which should be done by one.

Mr. Frank Hinckley, who recently died at his home in Old San Bernardino, first went to California as an engineer, but of recent years had been one of the most successful horticulturists in the southern part of the state. It is said that his father, in the year 1846, brought to California the first fruit-trees ever imported from the east.

The favorite flower of Mohammed was the Narcissus, probably the yellow Daffodil, which grows abundantly all through western Asia, and he gave his followers the following counsel: "Whoever has two loaves of bread, let him trade one for a blossom of Narcissus; for bread is nourishment for the body, but the Narcissus is food for the soul."

It is estimated that by careful cultivation almost one-fourth of all the cultivated land in China is made to bear two crops a year, while many portions produce three crops. The utmost ingenuity and economy are displayed in the use of manures, even the burnt fire-crackers which are left from the frequent festivals being strewn on the fields for the sake of their nitrogenous elements.

A western paper recently described a curious example of the natural "in-arching" of trees in Lawrence County, Illinois. The trunks of two Elm-trees, standing about twenty feet apart, have met at about the same distance above the ground, where they blend into a perfectly symmetrical trunk of large dimensions. The tree is nearly a hundred feet in height and very well developed, and wagons can, of course, easily be driven through the great triangle which forms its base.

Experiments reported by Professor Maynard, of the Massachusetts Agricultural College, give renewed testimony of the effectiveness of the Bordeaux Mixture as a preventive of mildew and black rot of the grape. Paris green added to the Bordeaux Mixture, even to the amount of one pound to 200 gallons, did no injury to either leaves or branches of Plum-trees, and, in the opinion of Professor Maynard, when used in the form of spray it will hold in check the curculio and the destructive black wart.

The Ministry of Imperial Property in Russia recently issued the following edicts: "1. Forests shall not be cut throughout, but in small portions at a time. 2. When a part of a forest is cut the ground shall immediately be cleared of the rubbish and fenced in so that no cattle can graze there. 3. Shepherds are forbidden, under a heavy penalty, to build fires either in the woods or within the limits of a forest in spots that have been cleared of trees."

At a recent meeting of the Society for Horticulture and Botany at Cologne one of the members highly recommended cellulose paper as a covering for plants which are left outdoors in winter, and especially for Roses. "This paper," says a report of his words in *Gartenflora*, "has been tried in the Public Garden of Cologne, and perfectly resisted the action of cold, snow and rain. Plants covered with it have remained uninjured in the very coldest winters."

In a recently published paper Professor S. Coulter says that the forest-area of Indiana has been reduced to 2,000,000 acres, about one-tenth of the total extent of the state, although it is still the fifth state in the Union as a producer of lumber. In Professor Coulter's belief, the distribution of forest-trees within the limited area of Indiana is but little influenced by geological differences, the main influences being elevation, the location of swamps and the course of rivers and streams. The most generally distributed tree of the 106 species that are indigenous to the state is Sugar Maple, which is found in every county.

In an article on plant legends, recently published in the *Deutsche Rundschau*, Dr. Von Langegg says that there is as much uncertainty with regard to the true meaning of the Biblical "Lily-of-the-Field" as with regard to that of "Rose of Sharon." Many persons have believed it to be *Tulipa Gesneriana*, which grows abundantly to the westward of the Sea of Genneserath, while others have found it in the yellow Daffodil, so common in many parts of Palestine. Later travelers say that it is *Lilium Chalcedonicum* or the red *L. Martagon*, which was formerly called the Byzantine Lily, and is especially abundant about Galilee, while still others speak for the purple flower of *Cynara Scolymus*, the wild Artichoke. The monks of the middle ages believed the Chalcedony Lily to be the true "Lily-of-the-Field," and hence introduced it into Europe and cultivated it largely, as the typical flower of the Virgin, in their convent gardens.

A correspondent of *Gartenflora* writes of a recent Chrysanthemum exhibition at Leipsic: "A well-developed specimen of Mrs. Alpheus Hardy was shown and must have pleased every expert. The downy covering was, indeed, not so prominent as to justify a comparison with a 'head of curls,' nevertheless it was downy. For myself, I am not enthusiastic with regard either to this or to the newer Louis Boehmer with reddish hairs, which comes from Peter Henderson in New York. It is not probable that either will reach commercial importance, for Mrs. Hardy is a lazy bloomer and so delicate that it is of little use for transport." To this the editors of the journal add: "We saw Mrs. Hardy at the end of November in Charlottenburg, but little of its lauded beauty was descernible; the flowers were not well developed." From this it appears that we have succeeded better with these famous varieties than have German horticulturists.

There is much truth in the following words which we quote from an article recently published in the New York *Tribune*: "Conservatories are much more frequently seen in England than in this country. Over here they are seldom met with even in houses of decided pretensions, and never, or hardly ever, in an ordinary dwelling. In London, however, almost every suburban house has its little greenhouse full of lovely bloom, opening invariably into the dining-room or drawing-room, . . . and it is really a pretty sight, that of a liveable English drawing-room, with its air of indescribable comfort and its glimpse through the half-opened door of the conservatory. . . . Whether it is the climate or the greater care taken, or because they are more genuinely loved than in this country, flowers certainly seem to thrive better in England, under amateur management, than in America. We suspect it is the latter reason. Americans do more for effect than the English; their flowers are decorations instead of dearly loved companions. These little conservatories, in ordinary well-to-do-families, are generally the charge of one of the daughters of the house, who daily cares for the delicate plants with undeviating regularity."

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Congress and the National Forests.

PERSONS who appreciate the important influence which our forests exert upon the well-being of the nation are often impatient at the apathy and dilatoriness of Congress in taking measures for their protection. It is true that our law-makers seem strangely inactive in this matter when we consider the energy they display in affairs of much smaller moment. Certain it is that no subject is likely to be brought before Congress which approaches this in the gravity of its ulterior consequences. A few years ago Mr. Carl Schurz, who not only has a comprehensive knowledge of European forests, but has been in a position while Secretary of the Interior to obtain special information as to the waste of the timber on our public domain, stated in a public address that he considered this question one of paramount importance; that discussions of tariff and currency and other economic problems might be postponed to some future day, for mistakes in this direction might be rectified by a change of system, and the losses incurred might be retrieved; but he added that "if the destruction of our forests goes on at the present rate it may bring on a train of disasters from which the country may never recover." This is a simple, unexaggerated statement of a truth which neither Congress nor the people of the country seem to realize. The untold millions of dollars which vanish into smoke every year by forest-fires; the additional millions which are stolen from the public domain and wasted; the millions more which are destroyed by flocks and herds, not to speak of the destruction of the very capacity of the soil to produce timber in the future; the more remote but equally certain disasters which come to soil and climate and public health from disturbing the balance of natural forces—all these things are either unknown or unheeded by the members of the national legislature, and the destruction is allowed to proceed from year to year without any honest attempt to check it.

It should be remembered, however, that members of Congress fairly represent their constituents in this matter. If the people of the country were adequately instructed they would stand appalled by the magnitude of the loss and danger which threatens, and they would speedily compel their representatives to take efficient action for maintaining the forest-property of the nation. The business interests which are benefited by protection take pains to make themselves felt in Washington; so do those industries which will be benefited by free trade. The men who imagine that the free coinage of silver will bring prosperity to them, and the other class who are equally convinced that such coinage will interfere with their prosperity, have agents at the Capitol at every session to force upon the attention of the members their demands in one direction or the other. The forests, however, have comparatively few friends. The people read of the devastation by fire, and feel a temporary flush of indignation at the waste of the present resources of the nation and of their children's inheritance, but they say little and do less. A few public-spirited men and women hold meetings now and then and pass resolutions, but their words lack the direct vigor of those which come from men whose personal interests are at stake. Proper legislation for our forests will never be accomplished until the people themselves are burdened with a personal sense of the need of such legislation. When public sentiment is once thoroughly aroused throughout the country the laws will come. Every attempt, therefore, to arrest attention and direct public thought to the necessity of a careful husbandry of our forest-resources should be gratefully welcomed; and we have been pleased to read that at a late meeting of the Nantucket Improvement Association the following resolutions were passed:

Whereas, the illegal and wanton encroachments upon the forest-lands of our nation are rapidly reducing the area of forest throughout the country, and leaving bare the tops and slopes of mountains, thus rendering difficult their reclothing with a growth of wood, and increasing the danger and damage from flood due to the destruction of the leafy mould; and

Whereas, selfish interests of individuals, land and railroad corporations are seeking to encroach upon tracts of land in the Rocky Mountain range, California and other sections of the country set apart for public use; or are seeking to prevent their enlargement as the best interests of the nation and the proper protection of said national reservations demand;

Therefore Resolved, That we respectfully request and urge the Congressional delegation of our commonwealth in the national Senate and House of Representatives to promote and press all measures that tend to protect our forests, and to suitably extend and improve our national parks, having especially in mind the Yellowstone Park Reservation, the Yosemite Park and the Sequoia Groves of California.

And, whereas, the Commissioner of the General Land Office recommends the repeal of laws forbidding the entry of rugged, stony or other timber lands unfit for cultivation and allowing settlers to use the timber on such lands which they may actually need to develop the country; and whereas, we believe that the repeal of these laws is a menace to the best interests of the country, that the time has fully come when the timber lands of the nation should be jealously guarded from destruction, and that a little forethought in the present may prevent serious injury and agricultural ruin to great sections of our country in the future, or may obviate the necessity of expending vast sums of money to recover from such injury and ruin; therefore

Resolved, That we urge upon the members of Congress to resist the repeal of any law that protects forest-land and to advocate all laws that may render forest-protection and extension more effective.

The national forests belong to the people of Massachusetts as truly as they do to the people of the states and territories in which they are situated; and it is their right to make protest against the failure to protect their property. It would be a hopeful indication if other organizations throughout the country would take similar action. If every rural improvement association, farmers' institute, grange convention, horticultural or agricultural society would discuss the propriety of making such petition it

would develop interest in the subject, stimulate inquiry and promote popular knowledge. It would organize and unify the thought and effort which are now lost because so desultory and disunited. It would impress Congress with the paramount importance of our forest-interests and serve notice upon our law-makers that here is one subject concerning which the people expect them to make laws.

A friend communicates the following from a letter recently received from Professor Goodale, who is now in Australia on his way to New Zealand:

It may interest you to know what species are grown as garden-plants in the cooler parts of Ceylon and in extra-tropical south Australia. In Ceylon, for instance, around the railroad station at Matale, in a well-kept enclosure, were the ordinary perennials and annuals of our own gardens. Phloxes, Pelargoniums, Portulacas, Zinnias, Tagetes and Roses were growing side by side with truly tropical plants. The juxtapositions were, in some cases, positively startling.

In Adelaide and vicinity, where oranges ripen in perfection and where the Date-palm is of vigorous growth (although practically unfruitful), one finds Chrysanthemums, Amaranths and the ordinary bedding plants in good condition. Some of the parterres in the Botanic Garden at Adelaide are extremely beautiful.

The Orchid houses contain about 400 species and varieties, mostly in good condition. The Fern houses contain almost 500 species and varieties, but there are many specimens distributed through the other houses. Overcrowding, that most natural and pardonable fault, is very marked, and would seem to demand imperatively that Dr. Schomburgk's request for additional houses should be granted by the colony.

I regret to say that Dr. Schomburgk, the Director of the Garden, the veteran explorer, the discoverer of the *Victoria regia*, is now very seriously ill. He has been indefatigable in his strenuous efforts to develop certain resources in the colony and to place its Botanic Garden among the attractions of Australia. In some cities one is asked at the clubs: Have you seen such and such a street or such and such buildings? In Adelaide the stranger is accosted by his host with the inquiry: Have you seen our Botanic Garden? And I can assure you that it is well worth seeing.

It is now a week before Christmas. The journal, *Garden and Field* (Adelaide, December), contains advertisements as follows: "For present sowing, new seeds of Primula, Calceolaria, Cineraria, Mimulus, Coleus, Pansy, etc." On our tables at luncheon we have strawberries, cherries, figs and apricots, but the latter are hardly yet ripe. They will be ripe, it is said, a week or fortnight after Christmas.

Insect Enemies of the Pitch Pine.

In Garden and Forest for January 7th I gave some account of the Tortrix-moth and the White Pine-saw-fly, which are injuring the Pines in southern New Jersey. But I find that these two pernicious insects are not the worst enemies that are attacking these trees, but that several species of beetles are making still greater havoc.

One of the most destructive is the Fine-writing Bark-beetle (*Tomicus calligraphus*). The female beetle of this species is small, not more than a quarter of an inch in length, but she is strong enough to bore through the rough bark of the Pitch Pine until she reaches the sap-wood and there makes a mine from ten to twelve inches long, running lengthwise of the tree. Along either side of this mine she makes little pockets quite close together, into which she drops her eggs. These hatch into tiny white grubs, and, as the little mother has prepared the foraging ground for this numerous offspring, all they have to do is to strike out for themselves, eating as they go, making little zigzag galleries extending at right angles from the mother's central mine.

The entomologist who named this beetle must have had considerable imagination to have called it the Fine-writing Bark-beetle, as the writing is not specially fine. Although it is so small, they come in large numbers and will soon kill a young tree. They loosen the bark, and the tree puts on a sickly look which seems to invite other beetles of larger size to help on the work of destruction. I have noticed several species of Buprestis on the leaves and trunks of the trees in May, June and July, and we know that the mission of these beetles is to perpetuate their race. Their main business here is to find good places for the next generation, whose food while in the larva state will consist of the pine wood.

These beetles are from half an inch to an inch in length, and most of them have a metallic reflection, which in some of the species is quite brilliant. It is wonderful how quickly they will find a disabled tree. Last summer about the middle of July a high wind struck our town, leveling a good many trees. Among those that were destroyed on my place was a Pitch Pine, which was broken off about twelve feet from the ground. The top was dense and heavy, and the trunk broke just below the branches, where it was about a foot in diameter. In less than a week from the time it was broken I noticed two or three species of Buprestis beetles on the trunk. *Chalcophora Virginiensis* and *C. liberta* were the most abundant, and they soon began to work their way through the bark until they reached the sap-wood.

Before the summer was over the result of their work could be seen by the sawdust all around the base of the tree, and their sawing could be heard at a distance of several feet.

I shall now have an opportunity of learning how long these beetles live in the larva state, and shall be able to tell whether any will come out next summer, or whether they will pass the second winter in the pupa state. I think, however, it will take two years or nearly that time for them to mature. I base my conclusion on the fact that two years ago some of these Pines were cut down, and I have just examined the wood and find the creatures in the pupa state still. I removed the bark from a portion of the wood and had a piece split off about fifteen inches long by three in width. In this small piece I liberated twenty-one pupæ, all alive.

These beetles ought to be called wood-engravers, for the mother's work in the soft sap-wood is really beautiful. It consists of moderately broad, wavy, irregular depressions, with narrow borders of raised work, which reaches up to the bark, making separate compartments. Their work is left very clean and white. In each of the compartments, placed on one side, is a little hollow or cradle, which the mother made for the safe-keeping of her eggs. She puts one in each hollow. On this piece of wood which lies before me most of the eggs hatched, and the larvæ have spoiled their little cradles by eating their way down into the wood. Some of them went nearly straight down two or three inches. Others went not more than half an inch, and then turned and went lengthwise of the grain.

The larva pupates in the bottom of its mine, where it makes a cell rather larger than the rest of the tunnel. The holes at the mouths of their tunnels, from which the beetles will escape next spring, are about one-fourth of an inch in breadth.

Dr. Packard says in his "Insects Injurious to Forest and Shade Trees": "After several years' attempts we have not been able to clear up the habits of either species of Chalcophora, or to detect the larvæ." I think he would have no difficulty in finding the culprits here in all of their stages.

I occasionally meet with the common Long-horned Pine-borer, *Monohammus confusor*, but it is not common here. The most that I have seen have come from White Pine lumber which has been brought from other localities. This beetle is remarkable for its longevity. I have a white pine bureau which I know to be thirty years old, and I do not know how much longer it is since it was made. In the summer of 1889 I heard a grating, creaking noise in this bureau for the first time, and as I had read accounts of this beetle living so long in pine furniture, I was much interested to see what would make its appearance. The saw-dust work of the creature was sprinkled quite liberally over the contents of one of the drawers. Finally a male Long-horned beetle nearly an inch in length, with antennæ about three times the length of the body, made its appearance. The creaking noise still continued and the dust was still thrown down, but I saw no more beetles that summer. Again last spring the noise commenced, and two more beetles of this species came out. These were females with antennæ not much longer than the length of the body.

Had these beetles been imprisoned there all these years, or had some mother beetle gained access to the bureau and left her eggs there?

Some twenty years ago I occupied a house with an unfinished attic. The timber in the attic was all of white pine. During the ten years that I remained there every summer more or less of these beetles came out of the wood. I never became satisfied whether they continued to reproduce their kind here, or whether they were all in the lumber at the time of building and remained dormant all these years. When a beetle came out from its imprisonment its first move was toward the light. There were several windows in the attic, but the blinds were usually all closed; still light came in between the slats, and the beetles always started for the nearest window, as if they had no purpose in view except to make their escape. The windows were generally closed, and so

not many left the attic alive, but died on and around the windows.

This bureau of which I speak stood in this house on the second floor just beneath the attic. It is veneered on all sides except the back, where possibly a mother beetle might have gained access. It is eleven years since it was removed, and if we conclude that the eggs were left then by one of these attic beetles, it must have taken them nine or ten years at least to come to maturity.

Vineland, N. J. *Mary Treat.*

Lenoir's "Elysée."

SOON after the National Assembly took control of affairs in France it charged its "Committee of Alienation" to see that all works of art contained in buildings which had been declared national property should be preserved and properly cared for. In consequence a "Monument Commission" was formed of artists and savants; the Maison des Petits Augustins, in a street of the same name in Paris, was set apart for the reception of works of sculpture and painting, and other confiscated monastic houses were appropriated for books, manuscripts and minor works of art. In the year 1791 Alexandre Lenoir, a young man of good education who had studied to be a painter, was appointed curator of the museum. The work of filling it was begun and completed by him, but when he died, in 1839, it had long been a thing of the past. After the Restoration, in 1817, his "Museum of French Historical Monuments" was suppressed, and its contents were either returned to their original homes or, in most cases, transferred to the Louvre, the Ecole des Beaux Arts or Père-la-Chaise. But, in the beautifully illustrated book which Lenoir fortunately wrote, the history of his museum and the description of its contents are preserved for us.*

If we judge by the light of our own happier day, the idea of dragging noble monuments from all parts of France to be set up coldly in a Parisian museum, shorn of their historic associations and of their old artistic environment, seems close upon a crime. Yet it is proved by almost every page of his book that Lenoir was a man of artistic feeling, and especially by passages like the one in which he says: "In spite of the multiplied protests of various artists, I have constantly solicited the transport of monuments of the Middle Ages, which they regarded as useless to the arts, and have succeeded in obtaining them." This is not merely to say that he was a more wide-minded vandal than most of his contemporaries. The Revolution had just spent its first fury, not only upon aristocrats and priests, but upon countless works of art which, in the minds of the populace, were dishonored by their connection with aristocracy or priestcraft. Monasteries had been confiscated and destroyed and their contents reduced to powder. Churches were faring hardly better. Less damage was done to the cathedrals of France, it is true, than had been done, by a more gradual process, to the cathedrals of England during the Reformation and the long years of indifferentism which followed it; yet they were greatly injured, while scores of other churches, sometimes of equal size and beauty, had been secularized or torn stone from stone. For years after Lenoir began to form his museum the work of destruction went on, though in a more legalized way. When Napoleon came with his strong hand to enforce respect for art as well as for law, there was less excuse for enlarging, or even keeping up, the museum. But Napoleon's intense desire to enrich his capital may well have encouraged the despoiling of his own provinces while he was ravishing foreign lands. Lenoir tells us of the state in which he found, for example, the famous Church at St. Denis, "which the fire seemed to have devoured from the crown of the vaults to the bases of the tombs," and of how he rescued from these tombs "such *débris* as could be restored." It is unquestionable that with all the harm he must have wrought in transporting his monuments, and especially in restoring them according to the skill of his unsympathetic time, he did more good than evil, preserving, if in a mutilated state, many things which would otherwise have perished, and, by the mere formation of his museum, insisting upon the value of the art of other days.

Just now, however, I wish to speak not of the museum itself, but of the so-called "Elysée" which Lenoir connected with it. The Maison des Petits Augustins, and even the street to which it gave the name, are now blotted from the map of Paris; but a hundred years ago it still had its old walled-in conventual garden, and in this Lenoir established a sort of factitious cemetery, naming it, in the classicizing spirit of the day, after the "Elysian Fields" of the Greeks. Such an Elysium, he says, seemed to suit the historical character which he had endeavored to give his museum, although one hardly sees the connection between a series of rooms filled with French monuments chronologically arranged, and a cemetery in which he strove to realize what he fancied to have been the idea of the Greeks with regard to a future world! However, his description is as charming as his cemetery must have been. "In this calm and peaceful garden," he says, "one may see more than forty statues; tombs, placed here and there on the green turf, lift themselves with dignity in the midst of silence and tranquillity. Pines, Cypresses and Poplars accompany them; small columns and cinerary urns, set on the walls, concur in giving to this happy spot the sweet melancholy that speaks to a sensitive soul. Here one finds the tomb of Abélard and Héloise, upon which I have had engraved the names of this unfortunate couple; the cenotaphs and recumbent statues of the Good Constable and of Sancerre, his friend; in sarcophagi executed after my plans and drawings rest the illustrious remains of Descartes, Molière and La Fontaine, and those of Turenne, Boileau, Mabillon and Montfaucon. Further off a column supports, in a vase, the heart of Jacques Rohault, worthy rival of Descartes. Near this philanthropic heart one discovers the modest and touching epitaph of Baptiste Brizard, that favorite of Melpomene, who once made the stage of France beloved."

Thus Lenoir writes in the general introduction to his book, and in the concluding volume a whole chapter is devoted to the Elysée. Much of it is taken up with sentimental explanations and reflections, but it also includes descriptions of some of the monuments and tells whence a number of the relics they enshrined had been brought—as the remains of Descartes from Sweden, and the heart of Jacques Rohault from the church of St. Geneviève, in Paris. This last fact certainly proves that something of vandalism had crept into Lenoir's original wish merely to preserve threatened treasures from destruction.

But our chief interest is with Lenoir's cemetery as a whole and the manner of its arrangement. As he says nothing to the contrary, he probably did not alter the disposition of the monastic garden, but simply arranged his looted and newly manufactured tombs among the Cypresses, Myrtles, Poplars, Pansies, Violets and Rose-bushes, to which he constantly refers as harmoniously surrounding them. His pictures show us many of these, and, if the delineators were faithful, the grouping of tall shafts with slender trees, and of lower tombs with masses of shrubbery, must have been both tasteful and effective. The most interesting, because most extended, view is the one which, on a slightly smaller scale, is reproduced on page 67. The monument in the foreground is that of Descartes, and was a creation of Lenoir's own. But in the middle of the picture we are delighted to recognize the famous statue of "Diane chasseresse," which Jean Goujon modeled, it is said, from Diane de Poitiers herself, and which formed the chief ornament of the *cour d'honneur* in her château at Anet. But for Lenoir this statue would have perished, as likewise Goujon's splendid gates which now stand in the court-yard of the Ecole des Beaux Arts; and on the fountain pedestal where he placed the statue it stood somewhat as it had at Anet (where its still loftier pedestal rose from the centre of a large ornamental basin), and must have looked far better than it does to-day near the eye in a small salon in the Louvre.

Another glance at the picture will show the chief reason why an account of Lenoir's Elysée is here in place. It is an almost ideal picture of that natural aspect which we strive to give our own cemeteries and which is generally thought a distinctively American conception. Of course one dares not speak too decidedly; but it seems as though this Elysée may well have been the first realization of such a conception—as though Lenoir had been the inventor of a scheme which, probably in all ignorance of his ephemeral creation, has since been so widely and variously elaborated in the New World. And where have we improved upon his execution of the scheme? Certainly not in our monuments themselves, even if we judge by the most *banale* of those which he himself designed, and certainly not in their arrangement as regards one another and the natural features associated with them—a fact which would be still clearer could we show more of the pictures in his book. Is not such an unsymmetrical yet harmonious grouping as his far better than our usual attempts, where we vibrate between a formality at variance with natu-

* *Musée des Monumens français, ou Description historique et chronologique des Statues en marbre et en bronze, Bas-reliefs et Tombeaux des Hommes et des Femmes célèbres pour servir à l'Histoire de France et à celle de l'Art. Par Alexandre Lenoir, Fondateur et Administrateur du Musée.* A Paris. [The first volume bears the date 1800, while the others were published from time to time down almost to the date of Napoleon's banishment.]

ralistic surroundings and a heterogeneousness without harmony or coherent effect? Would his Elysium have been improved by railings to show just how much property each dead man might claim? Or by mounds to explain beneath just what square of turf his body lay? Have we not here at once harmony and variety, dignity, grace and true repose? And while each monument helps the effect of the others, is not each sufficiently conspicuous and individualized? Of course we cannot often have Grecian colonnades or statues of the importance of the "Diane"—nor should we want one just like the "Diane," which was evidently out of place in a so-called cemetery. But simple square tombs, columnar shafts, and small monuments like the one we see to the right of the "Diane" are well within our reach, and there is no possible reason why our planting should not be as artistically done as the old monks had done it, in unwitting anticipation of Lenoir's needs.

One longs to know whether Lenoir really altered the garden, or, if not, just when and by whom it had been arranged. For, at the end of the last century, "natural" gardening arrangements had only just begun to be liked in France, Marie Antoinette's famous "English Garden" at Versailles having been the first of its kind. A small urban garden is the last to which we should have looked for an innovation upon the long-prevailing formality in design.

New York. *M. G. Van Rensselaer.*

Plant Notes.

Some Recent Portraits.

A LARGE part of the first number of the new volume of the *Botanical Magazine* is devoted to the wonderful Aroid of Sumatra, *Amorphophallus Titanum*, which flowered last year at Kew, two double and a single plate (*t.* 7153, 7154, 7155) being necessary to display its habit and floral structure. This plant is certainly one of the wonders of the vegetable world, and the fact that it has been grown and flowered at Kew is pretty good testimony, if such testimony were needed, of the enterprise and skill of the Director of that great establishment and of his assistants. "The single flower," to quote from Dr. Beccari's account of its discovery, reproduced by the editor of the *Botanical Magazine*, "with the tuber from which it springs almost directly, form together so ponderous a mass that for the purpose of transporting it it had to be lashed to a long pole, the ends of which were placed on the shoulders of two men. To give an idea of the size of this gigantic flower it is enough to say that a man standing upright can barely reach with his hand the top of the spadix which occupies the centre of the flower, and that with open arms he can scarcely reach halfway round the circumference of the funnel-shaped spathe from the bottom of which the spadix arises." Forbes, in his "Naturalist's Wanderings in the Eastern Archipelago," encountered the plant, and describing it says, on page 175, that he found it in the Barisan range growing in sandy soil, the largest specimen measuring seventeen feet in height, and again that on the Kling River he met with the largest tubers which have yet been noticed. They were six feet six inches in circumference, the stem at the base girthing two feet seven inches, the whole forming a load for twelve men. But perhaps even a better idea of the size of this plant appears from the fact that a full-size drawing of it, made under the direction of its discoverer, Dr. Beccari himself, and presented to Kew, occupies a canvas, without margin, which is eighteen feet long by fifteen feet six inches broad. It represents a leaf of the full size growing out of the ground, and underneath it two Sumatrans carrying a flowering specimen lashed to a pole.

The other plant figured in this issue of the *Botanical Magazine* is *Dipladenia illustris*, var. *glabra* (*t.* 7156), a native of Brazil, where it has a wide range from the Province of Bahia, in the north, to that of St. Paul, in the south. It is a pretty stove-house climber, with rosy red flowers and thick, coriaceous, dark green leaves.

The colored plate of the issue of January 1st of the *Revue Horticole* is devoted to the beautiful new hybrid dark red Rose, La France de 1889, obtained by Monsieur Moreau-Robert, of Angers, by crossing the Rose Marie Henriette with pollen from La France. The seed obtained from this cross was sown in the spring of 1883. It produced two plants only. Of these one produced a single flower, and the other, which grew vigorously, is the one to which this rather unfortunate name has been bestowed. Monsieur Carrière believes that La France de 1889 is one of the best seedling Roses ever obtained in France.

The colored plate of the issue of *The Garden* (London) for January 10th represents a flowering branch of one of the varieties of *Clematis Viticella*, a native of southern Europe and western Asia, and an inhabitant of gardens for three centuries at least. *Clematis Viticella* is one of the most graceful and charming of all hardy climbing plants, with long-stemmed drooping flowers, which appear in succession from June until September. Many varieties have been developed in cultivation, that figured in *The Garden* being one of the most attractive.

New or Little Known Plants.

Clethra alnifolia, var. tomentosa.

THIS handsome plant, which botanists consider a variety of the Clethra or Pepper-bush, which is so common along the borders of swamps near the sea-coast of the northern states, is quite distinct from the garden point of view and a desirable plant to cultivate, because it does not bloom until the northern Clethra is out of flower, and because it continues to produce its flowers late into the autumn.

This variety, as it appears in the Arnold Arboretum, forms a spreading bush three or four feet high with ample, ovate leaves, entire toward the base, sharply serrate above, two and a half to three inches long, one and a half inches broad, pointed or rounded at the apex, and covered even at maturity on the lower surface, as are the shoots of the year, the branches of the panicles, the pedicels and the outer surface of the calyx, with dense hoary tomentum, which is the characteristic feature of this plant. The flowers are produced in panicled racemes, which exceed in length those of the northern plant, and are sometimes six or eight inches long. The individual flowers, too, are considerably larger, but otherwise not different from those of the common Clethra.

Clethra alnifolia, var. *tomentosa*,* is probably a rare plant in its native swamps, and I have never found it in any part of the southern states I have visited. It was discovered by the elder Michaux growing in swamps in South Carolina, and there is a specimen in the Gray Herbarium collected by Chapman in Florida, without any particular locality being indicated, and one from Alabama, also without locality. It is, however, an old inhabitant of European gardens, where it appeared during the last century, and various portraits of it have been published, although none of them do much justice to the beauty of the plant.

The specimen from which our figure (Fig. 14, p. 65) has been made has been growing for a number of years in the Arboretum, where it flowers regularly during nearly two months every autumn with the aid of a slight winter protection of evergreen branches, but it has not produced fruit. It was derived from the Royal Gardens at Kew.

C. S. S.

Foreign Correspondence.

New Plants of 1890.

THE new and noteworthy plants introduced into English gardens last year were noticed by me almost weekly in my letter to Garden and Forest, while in his lists of new Orchids Mr. Rolfe has kept your readers well informed of these plants. It may, however, be worth while passing in review the most noteworthy of all these new introductions, judging them on their merits as plants for the garden. For a plant may interest, and even appear pretty, in a botanical sense, and yet have little or no claim to the notice of horticulturists.

The whole catalogue of the new plants of last year contains scarcely anything of exceptional merit. Not even among Orchids, usually so rich in new prizes for the cultivator, is there any one plant of extraordinary interest or beauty equal to those we already possessed, though there are not a few which might be classed as first-rate acquisitions did they not resemble so closely others already in cultivation.

* *Clethra alnifolia*, var. *tomentosa*, Michaux, "Fl.," i., 260.—Chapman, "Fl. S. States," 264.—Gray, "Syn. Fl.," ii., i., 45.
C. tomentosa, Lamarck, "Dict.," ii., 46.—Hooker, *Bot. Mag.*, t. 3743.—Watson, "Dend. Brit.," i., 39, t. 39.—Loudon, "Arb. Brit.," ii., 1128, Figs. 928, 929.
C. incana, Persoon, "Syn.," i., 482.
C. pubescens, Willdenow, "Enum.," 455.

Fig. 14.—Clethra alnifolia, var. tomentosa.—See page 64.

The question naturally arises, How is it that so few good plants are introduced now, compared with the rich harvest each year brought, say, in Dr. Lindley's time or even later? Have nurserymen and others interested discovered that more can be made out of the material already at hand by cross-breeding, selection, etc., than out of new introductions? It cannot be that the ground is exhausted; that everything worth having has been secured. There are scores, one may safely say hundreds, of beautiful plants known to botanists which have never yet been seen in the garden. China, upper Burma, New Guinea, Madagascar, Africa and South America teem with good garden-plants of all kinds. Even ground already beaten over by collectors contains many beautiful plants unknown in horticulture, while among early introductions, which have since disappeared from gardens, there are a great number of first-rate things.

Of course we have an enormous number of beautiful plants in every department of the garden, and, as many would say, more than sufficient for our needs. Yet a new introduction of sterling merit is certain to find general favor, and while we all love old favorites we are all of us always ready to welcome new friends.

Orchids.—Perhaps the most interesting new Orchid of 1890 is *Moorea irrorata*, a new genus, which flowered at Glasnevin, and is named in compliment to the Curator, Mr. Moore. It is allied to Houlletia, has a spike eighteen inches long, bearing a dozen fleshy flowers, two inches across, and colored rich reddish brown. Unfortunately, Mr. Moore's plant is unique, and we do not even know of what country it is a native. *Dendrobium Macfarlanei*, introduced and flowered by Messrs. J. Veitch & Sons, is beautiful in flower, but it comes from New Guinea, and, like almost all the Dendrobiums from that region, it is, unfortunately, too difficult to manage to ever find general favor. Among Cattleyas the only new introductions of note are *C. Warocqueana*, *C. Lindeni* and *C. Rex*, of the Messrs. Linden. The first-named is an improved *C. Gaskelliana*, the second a good *C. labiata*, and the third not unlike the white *C. aurea*, known as *C. Imschootiana*. *Cymbidium Traceyanum* is a big-flowered *C. Hookerianum*, the older name for which is *C. grandiflorum*. Three new Sobralias, named *S. Lowii*, *S. Sanderæ* and *S. Wilsoni*, differ only slightly in color from species already known in gardens. There are only two newly introduced Cypripediums—*C. Schomburgkii* and *C. Siamensis*—and these are scarcely more than botanical curiosities. The same may be said of the seven new species of Masdevallia. This genus is attracting an unusual amount of attention just now, as is shown by the fact that more new species have been introduced lately than of any other genus of Orchids. The pick of the lot is *M. Lowii*, which has the habit of *M. Chimæra*, tailed flowers, three inches across, and white with purple spots.

Varieties of species already established in gardens continue to appear among the numerous plants annually imported, and some of these are valuable. Cattleyas have produced *C. Lawrenciana*, var. *Vinckii*, with flowers of a decided bluish or magenta hue; *C. aurea*, var. *Imschootiana*, with white sepals and petals and a richly colored lip; *C. granulosa*, var. *Buyssoniana*, with white sepals and petals. Lælia have revealed several excellent varieties, particularly in *L. præstans alba* and *L. elegans Broomeana*.

Hybrid Orchids eclipse in beauty and interest the new introductions. Best of all is *Phajus Cooksoni*, a hybrid between *P. tuberculosus* and *P. Wallichii*, raised by Mr. Norman Cookson. It has the constitution of the latter parent and the elegance of the former, plus a rich rosy color. This Orchid ought to prove a useful garden plant. Equaling the Phajus in interest is the hybrid *Odontoglossum Leroyanum*, raised by M. Leroy, gardener to Baron E. de Rothschild at Gretz, its parents being *O. crispum* and *O. luteoparpureum*. It is the first hybrid Odontoglossum originated in the garden. Equally interesting are the two bigeneric hybrids produced and flowered last year by Messrs. J. Veitch & Sons—namely, *Epiphronitis Veitchii* and *Sophrocattleya Calypso*. *Masdevallia Stella* is an additional hybrid in this genus. Dendrobiums have produced several beautiful hybrids, those exhibited by Sir T. Laurence at the beginning of the year being at least as beautiful and interesting as the best of those previously raised; they are named Juno, Luna, Chrysodiscus and Melanodiscus. Something like thirty hybrids have been added to Cypripedium, and, whilst a few of them are good, most of them are of no account. The cream of them are Aylingii, H. Ballantine, Pollettianum, Vipani and Osbornei. Cattleyas and Lælias have added nothing particularly noteworthy.

Stove and Greenhouse Plants.—The most interesting new plants in this department are the following: *Heliamphora nutans*, which has been successfully introduced from Roraima by Messrs. Veitch and which flowered in their nursery last year. It is a near ally of Sarracenia, having erect, pitcher-like leaves and regular white flowers not at all like those of Sarracenia and Darlingtonia. Hitherto, however, the Heliamphora has not shown a disposition to grow freely under cultivation.

Messrs. Veitch have also distributed three new Nepenthes of good quality—namely, *N. stenophylla*, a narrow pitchered species not unlike *N. Curtisii*, and two varieties of the excellent *N. Burkei*, named *prolifica* and *excellens*.

Clematis Stanleyi must be numbered among the prizes of last year, but it needs no more than mention in these pages. *Hæmanthus Lindeni* is a handsome species in the way of *H. Kalbreyeri* and *H. puniceus*. Mr. Bull's *Sonerila orientalis* and varieties are pretty additions to this class of stove plants; they have prettily marked foliage, a free branching habit, and produce bunches of bright-rose, attractive flowers in profusion. A new Fern, in the way of *Pteris cretica*, but far more elegant, has been introduced by Mr. Bull and distributed under the name of *Pteris ensiformis*, var. *Victoræ*. This will become popular as a table-plant, as its fronds are semi-erect, very graceful and prettily mottled with silvery gray on a bright-green ground.

Calla Elliottiana is a plant which ought not to be lost sight of, as it has all the charm of the common *C. Æthiopica*, differing only in the clear sulphur-yellow of the spathe. *C. Æthiopica*, var. Little Gem, is remarkable in having small flowers and leaves scarcely a foot high.

Cineraria lanata, a tall, handsome-flowered, greenhouse plant, and *Dipladenia atropurpurea*, with rich purplish-maroon flowers, were reintroduced into gardens last year after an absence of long enough to make them practically new.

Hardy Plants.—*Lilium Henryi* is the most interesting and promising of these. It has already been noted in Garden and Forest, but I may supplement the information already given by recording the fact of the bulbs having stood uninjured the severe weather here of the past two months. *L. Bolanderi* is another new Lily, small-flowered, almost black in color and likely to please those who cultivate this beautiful but somewhat refractory genus. Three new species of Gladiolus, namely, *G. decoratus*, *G. primulinus* and *G. Kirkii*, flowered at Kew last year, and were so distinct in color and size as to have attracted the attention of breeders of these plants. These three will no doubt eventually be heard of again. *Thalictrum Delavayi*, a pretty hardy Fumitory from south-western China, completes the list of new, good, hardy, herbaceous plants.

Trees and Shrubs.—*Cytisus scoparius*, var. *Andreanus*, is the only beautiful new plant in this department. It is a seedling variety of the common broom, the flowers large, rich yellow, with the wings colored velvety maroon. Grafted on short stocks of the type it makes a presentable pot-plant and flowers freely when small, so that it should prove valuable in spring as a greenhouse plant.

London. *W. Watson.*

So select the material of planting, or the native material to be left growing, that, within reasonable limits, the principle upon which Nature, unassisted, proceeds in her selections shall be emphasized, idealized or made apparent in landscape quality. *F. L. Olmsted.*

Cultural Department.

Notes on Some Hardy Wild Roses.—V.

We have, indigenous to America, a little group of several species of hardy wild Roses which are not surpassed for beauty and general effectiveness by any introduced species which possess similar characteristics in habit and in color of flowers. So far it appears that few variations from the natural types have been derived from them. One of the most common and familiar wild Roses, which is found on the rocky soils in many places along the sea-coast of New England, is *Rosa lucida*, the so-called Dwarf Wild Rose of Gray's "Manual." This popular name, however, is not to be relied upon as indicating its habit or stature, because, although it is generally rather a dwarf plant in exposed situations, under more favorable conditions it commonly attains a height of from four to five feet.

This species may generally be distinguished from its congeners, by persons who are not botanists, by its rather thick, dark-green leaflets, which are smooth and shining above.

The foliage often assumes brilliant reddish or orange colors in the autumn, and for this reason it is often effective when growing in masses in shrubberies and similar places. The plants have more or less of a tendency to spread over the ground by underground shoots. This characteristic, however, is not nearly so highly developed in this species as it is in *R. nitida*, which spreads very freely and thickly over the surface of the ground by means of surculose stems from the parent plant. *R. nitida* may generally be readily distinguished from the last species by its smaller, narrower leaves, and especially by having its stems densely covered with straight slender prickles, which are of a reddish color. The plant is much more slender than *R. lucida*, and rarely grows more than two or three feet high in cultivation.

The flowers of both species are in best condition in the latter part of June and they are of a bright rose color. Although equally beautiful, those of *R. nitida* often seem slightly more attractive, an effect which may be due to its smaller bright green leaves and slender stems. This species generally grows best in moist situations, and the bright color of its foliage in autumn is often quite striking. The fruit of this and of *R. lucida* often remains bright and fresh-looking throughout the winter; but in this region, owing to the attacks of the beetle, *Rhynchites bicolor*, the hips are generally imperfect.

The surculose habit of *R. nitida* is imitated by the little Prairie Rose, *Rosa foliolosa*, which was figured on page 101 of the last volume of Garden and Forest. *R. foliolosa*, however, is a very much more slender and more dwarf plant, with very few branches; and, moreover, it differs in having its stems, which are of a light green color, entirely free from prickles, and only possessing straight, geminate, infrastipular spines, which are often weak and slender. On the flowering branches, indeed, the spines are either absent or so little noticeable when handled that the species might almost be called a thornless Rose. The stems of this Rose are peculiar from the fact that they do not live more than two or three years. The new shoots branch and flower the second season, after which they wholly or partially die and are replaced by new stems arising from or from near the ground. In this habit it is like some of our Raspberries.

Although naturally only native to regions so far south as Arkansas, New Mexico and Texas, *R. foliolosa* seems perfectly hardy at the Arboretum, where it grows from eight or ten inches to a foot and a half in height, and spreads freely by underground stems or suckers, by which it may be very easily propagated. The sweetly fragrant flowers are two inches in diameter, and usually solitary on the ends of the shoots. The earliest of them do not open in this latitude until the first or second week of July. There is no profusion of bloom at any time, but a few flowers continue to be produced throughout the rest of the summer, so that the species appears to have more or less of the character of the ever-blooming Roses.

It is a curious fact that, although it has been collected by many botanists, there do not appear to be any definite observations or statements on record regarding the color of the flowers of this Rose. In the original description of Nuttall's specimens in Torrey & Gray's "Flora of North America," p. 460, the flowers are described as "apparently rose-colored," and the description accompanying the illustration in Garden and Forest states that they are "bright pink." Berlandier, who collected it in Texas, notes that the color of the flowers is "pallide rosei"—pale rose color; and in the only nurseryman's catalogue where I have seen it advertised it is described as from Texas and producing "pinkish-white, very fragrant

flowers all the season." The plants in the Arboretum, however, originally grown from seed collected by Dr. George Engelmann in New Mexico, have flowers of a very pale lemon-yellow or creamy-white color, and there is not the slightest appearance which would give the suspicion that the blossoms were ever rose-colored or pink, unless it is that a slightly rosy tinge may be detected on the outer edge of the petals when they are about to fall. It may be that the color in these plants is abnormal, but it hardly seems probable.

The fruit ripens in late autumn, it is light red in color and is rather sparingly produced here. On account of its white flowers and continuous blooming habit this Rose may prove to be of much interest and value to hybridizers as soon as it becomes well known and disseminated.

Of the hardy wild Roses indigenous to the eastern part of North America the species known as the Swamp Rose (*R. Carolina*) is one of the most familiar.

It is the tallest-growing of our local species, as well as the latest to flower, the rather small blossoms not appearing until the first or second week of July, or after the beauty of most other wild Roses is past. In the shrubbery the flowers usually appear in large corymbose clusters, and they are followed by a profusion of bright red fruit, which retains its color throughout the winter.

Arnold Arboretum. *J. G. Jack.*

Fig. 15.—Cemetery of the Musée des Monuments français.—See page 63.

Plant-Houses for Amateurs.—II.

THE amount of coal consumed in any stove will vary somewhat according to the judgment of the fireman, but firing twice a day a stove for the house described in an earlier article will consume half a ton of coal a month, during ordinary winter weather, in maintaining a sixty-degree Fahrenheit night temperature. Where more frequent supervision is given and the cinders utilized a saving on this amount of fuel can be made. The small stove has a capacity for the consumption of a much larger amount of fuel than this, so that in extreme weather its heating capacity is quite up to the house of the size described. My preference is for a larger stove which has a larger fire-pot, and which, while burning slightly more coal, has a larger body of fire and requires the minimum of attention. Such a stove will burn steadily with closed drafts on a consumption of 1,200 pounds of coal a month. Probably in most cases the small stove would prove entirely satisfactory, my preference for the larger being not only because it requires less attention, but because it is also useful in the fall, when I screw on 200 feet of pipe to warm a Chrysanthemum shelter, at which time, of course, the consumption of coal is largely above the winter average.

Among other methods of heating, the old tile flue seems to be the best, and is no doubt good as long as the flue is tight. There are numerous suggestions for heating with coal oil and sketches of arrangements to make it efficient. Perhaps, for a cold house, where an occasional fire is desired, coal oil may answer as a makeshift, but in my experience coal oil is expensive for a steady heat, and I have never found odorless oil or smokeless stoves, and these latter require at all times great care, and are unpleasant things to handle. A flue is necessary to carry off products of combustion, and the slightest downdraft will throw smoke into the house.

Such a small plant-house has, of course, its limitations, and will not hold many specimen plants, but will shelter more plants than would seem credible. With a judicious selection one may have a fair number of flowers at all seasons, especially if a supply of bulbs is potted up and held in reserve to be brought on as required. As our piscatorial friends do not measure the success of their expeditions by the weight of the fish caught, so the amateur grower of flowers has other pleasure in the cultivation of plants than in the mere magnitude of the crop of flowers. A place in the warmest corner should always be reserved for seed-pans, for until one grows seedlings, and notes from day to day their development, he misses one of the most interesting features of gardening. There is a never-ending interest attached to the germination of seeds. In the same corner, also, should be made a bed of sharp sand, to be changed as required, where propagation of all kinds may be carried on. If a frame be made over this, on which a plant may be temporarily placed, it will often be useful in grafting or in other cases where a close atmosphere is required. Of course, this bed should have a bottom of slate or zinc, and it is well to box in the space under the bench at this point to confine the heat. A sash house is considered a rather crude structure, but I find it has one advantage, which is that where a house is left without attention all day, it gives a certain amount of desirable shading when, as often happens, the sun becomes unexpectedly powerful, and the ventilators

are not open as freely as they should be for the rapid change of air. It seems to me that modest houses of this character would often be satisfactory to those who have a fancy for flowers and do not care to maintain a show-house or employ a professional gardener.

Elizabeth, N. J. *J. N. Gerard.*

Tomatoes Under Glass.

IN the rapidly extending practice of winter-gardening at the north the variety as well as the quantity of crops grown has largely increased. Among these crops the Tomato has assumed considerable importance, and has been the subject of various experimentation at the Cornell Station for the two seasons since the erection of forcing houses here.

The first crop of this season, which began to ripen the last of December, has been very thrifty throughout its growth. The seed was sown in the usual manner in August, and about a month later the plants were placed in their permanent quarters in boxes upon the benches of the forcing house. The boxes used are of two sizes, the smaller being ten inches each dimension (for a single plant), and the larger eighteen inches square by twelve deep, being used for four plants, which are placed near each corner. The bottoms of the boxes are nailed on somewhat openly, and an inch of cinders or other broken material is placed over them to ensure abundant drainage. Upon this was placed a layer of decaying sods, followed by garden soil, filling the boxes a little more than half full. As the plants grow several inches more of soil are added, thus inducing the development of the secondary roots upon the stem. All lateral shoots are removed as fast as they appear, and the terminal shoot also when the plant reaches a height of about four feet. As soon as the main stem begins to lop over the plants are trained to upright cords stretched to the rafters, being loosely tied to them with a loop of raffia placed just below a leaf.

As would be inferred from its behavior out-of-doors, the Tomato requires a high temperature in the house, not less than sixty degrees at night, ventilating at seventy degrees on cloudy days, while on sunny days the mercury may safely run much higher. When the plants are in flower some aid should be given in pollinating. As the flower of the Tomato is self-fertilized, this is easily accomplished by jarring the plants on bright sunny days by gently striking the stem with a padded stick. As the fruit sets the larger clusters should be tied up to the stem to prevent them from breaking down. Throughout the fruiting period it is profitable to apply liquid manure once a week; or, as was done with this crop, place a layer of stable manure over the soil, the leachings from which will be carried into the earth from day to day as the plants are watered. It is absolutely indispensable to the success of this crop that the houses should be so located as to receive all the light possible throughout the day. This necessity has been forcibly illustrated in the present instance by a few plants which stood in the end of the house and received the direct sunlight only until noon because of an adjacent building. Although they were by no means in the dark through the remainder of the day, yet the lack of light was plainly indicated by the greatly decreased fruitfulness, sufficient, as was remarked by an observer, to make all the difference between a liberal profit and absolute loss.

We have had to fight a number of insect pests, including the ever-present aphis and a black mite which is a near relative of the red spider and which has appeared with it. This mite appears not to yield readily to the commoner remedies which prove more or less effectual with the red spider, although it is destroyed by a solution prepared from one part of pyrethrum to four parts of alcohol (by weight), and applied with an atomizer. This is a tedious process, however, with plants as large as Tomatoes, and it is hoped that a better method will be discovered. On the plants mentioned it has been quite successfully held in check by burning the leaves which were most infested.

Four varieties have been grown this winter—the Lorillard, Ignotum, Dwarf Champion, and a yellow variety, the Golden Queen.

Of these, the Lorillard appears best adapted to forcing, although the Ignotum seems to approach it. The Dwarf Champion, while fairly productive, would be objectionable in most markets on account of its color, which is tinged with purple. The same objection would hold with the Golden Queen, although it is a beautiful fruit, and, if grown to a limited extent with the red varieties, would certainly add to their attractive appearance if tastefully arranged with them in the markets.

Although the cultivation of the Tomato is attended with somewhat more difficulty than many other forced crops, it brings generous profits when once its management is understood. In the crop referred to each plant occupies two square feet of space, and is producing, upon a very conservative estimate, at least an average of one pound of fruit a plant.

While this is very far short of the claim of an average crop of twenty-five pounds a plant for 300 plants, which was made and published last season, it is still large enough to allow of very satisfactory returns, as the wholesale price in our large cities ranges from fifty to seventy-five cents per pound through the winter months, so that one can readily estimate the returns of the crop from a house of a given size.

Cornell University. *C. W. Mathews.*

Some Useful Palms.

Astrocaryum Mexicanum.—This handsome species deserves a place in any collection of Palms, for, although it ultimately attains considerable size, it may be kept within reasonable bounds for several years. It has large pinnate leaves, the pinnæ being somewhat irregular in width in a young plant, dark green on the upper side, while the under surface is clothed with a silvery tomentum. The leaf-stalks, well armed with long dark spines, give this plant quite a formidable appearance, but also add to its beauty, and, as the foliage is of stout texture and lasts a long time, it usually remains well furnished. This Astrocaryum may be grown in a temperature that falls to fifty degrees at night, but will make more rapid progress in a warmer house, and it enjoys copious watering in bright weather. It is propagated by seeds and by suckers, when these are obtainable.

Ceroxylon Andicola.—The Wax Palm of New Grenada, as this magnificent plant has sometimes been called, is also a useful Palm when small, the leaves being quite tough and capable of enduring out-door exposure in the summer if they are not placed in the full sun, while for conservatory ornamentation it has few equals. It has pinnate leaves that sometimes attain a length of fifteen to twenty feet, this extreme size only being reached by fully grown specimens. The petioles are nearly erect and well clothed with narrow pinnæ, which are dark green and glossy on the upper side, and covered underneath with silvery scales, so as to make an effective contrast. In the young plants the leaves are frequently entire, as is the case with many other Palms. But this condition is gradually outgrown. The name of Wax Palm has been applied to this species from the singular fact that the trunk, when fully grown, is more or less covered with a coating of highly inflammable wax. This characteristic is not seen, however, in the ordinary conservatory specimen. In the matter of temperature this Ceroxylon is not very exacting. Though usually grown in stove heat, the fact of its having been found almost up to the snow line in New Grenada seems to indicate that cool treatment would be the most reasonable.

Acanthophœnix crinita.—This graceful Palm, originally introduced from the Seychelles, has the general character of an Areca, but differs from it in being profusely armed with long, needle-like black spines, which are abundant both on the stem of the plant and also on the leaf-stalks. The leaves of *A. crinita* are pinnate and from five to twelve feet in length, the pinnæ being pendent, and light green on the upper surface and silvery beneath. This Palm enjoys a rather high temperature, and in the winter should be watered with judgment, or the roots may suffer. It can only be propagated by seeds, as it makes no suckers, and, as the seeds sometimes take two or three years to germinate, patience must be exercised, or the seeds may be discarded as worthless before they have a chance to germinate. *A. crinita* is, however, a valuable plant when well grown, and quite repays any special effort that may be required in order to obtain a good specimen.

Nephrosperma Van Houtteana.—This elegant Palm is probably better known under one of its previous names—that is, either as *Areca nobilis* or as *Oncosperma Van Houtteana*—and is the only representative of the genus as it now stands. It is also a native of that favored locality for tropical Palms, the Seychelles, and has most gracefully arched pinnate fronds, with long dark green pinnæ. The stems of this species are also well protected by long dark spines, and, like all other spiny Palms, it is difficult to clean if brown scale secures a foothold, and therefore this pest should be closely watched for. *N. Van Houtteana* grows best in a warm moist house, and may be potted in such soil as would be suitable for Arecas, one of the requisites to success being good drainage. This Palm is by no means common, though its notable beauty entitles it to more extended recognition.

The Martinezias comprise another handsome genus of stove Palms. *M. caryotæfolia*, *M. erosa* and *M. Lindeni* are good examples of these moderately dwarf South American plants. *M. caryotæfolia* has dark green pinnate leaves, with pinnæ arranged along the petiole in groups of several pairs, wedge-shaped, and quite broad at the apex. This is a decidedly handsome species, and also a very thorny one, as the spines are not only arranged on the stems, but also to a greater or less extent on the under side of the pinnæ. *M. erosa* has also pinnate leaves, and, as its name indicates, the tips of the leaflets look as though they had been bitten. This species is extremely spiny, not only on the stems and under side of the leaves, but also on the upper surface. *M. Lindeniana* is somewhat similar in general characteristics to *M. caryotæfolia*, but has larger terminal pinnæ, which are lighter-colored beneath. *M. Lindeniana* makes very handsome specimens, and should be seen more generally.

Holmesburg, Pa. *W. H. Taplin.*

Notes from a Pennsylvania Garden.

Clematis graveolens.—This plant is not new, but it ought to be more widely known. It is hardy, of such vigorous growth that it rapidly covers a trellis or arbor, and yet it is exceedingly delicate and graceful in appearance. The flowers, it is true, are not as large as they are in some other varieties, and are not a perfectly clear yellow, but they are abundant, and are followed by pompon-like heads of fruit, which are far finer than those of any other species of Clematis. They are very symmetrical, of exquisite delicacy of detail, and last in good condition for several weeks. This species, moreover, is practically free from the mildew which attacks so many of our climbers. *Clematis Virginiana* ought never to be placed in even partial shade on that account, for it will be ruined by mildew before midsummer. It would be hard to say which is the best Clematis, but *C. graveolens* claims attention for its vigorous, graceful habit, striking fruit and freedom from fungus attacks.

Akebia quinata.—This woody climber is well known for its vigorous growth, which starts early in the spring, and its close-twining habit. It will soon cover a large surface almost as closely as an Ampelopsis. The quinate leaves are of a type not common with us, and they keep their shape and color so far into the winter that they barely escape being fully evergreen. The flowers, although not conspicuous, are deliciously fragrant, and become more abundant as the vine gets older. In order to reach good development it should have considerable direct sunlight. The most difficult problem to deal with in planting about buildings is to find plants that will thrive in the shade.

Saururus cernuus.—Experience here with the Lizard's Tail has been curious and interesting. It is not native to this region. About ten years ago a few root-stocks were planted in a small artificial bog along with several other species of marsh plants. The Saururus flowered that season, from buds previously developed, but has never flowered since. The yearly growth is exceedingly strong, and it has crowded out everything else, covering the whole surface of the bog. The water sometimes dries away entirely in the fall, but if this has any effect it would seem to be to diminish rather than increase the vigor of the plants, and therefore to induce, rather than prevent, their flowering. *Pontederia cordata* has not been affected unfavorably by this drying, nor has *Nymphæa odorata*.

State College, Pa. *W. A. Buckhout.*

Seed-Sowing.

WORK among hardy plants is now entirely suspended in the colder sections, but when the season reopens there will be many other things that will need attention at the same time, and, therefore, there is no better time than the present to arrange for the coming year's display. There is also no better time than the present to sow seeds of hardy perennials if one has the convenience of a heated house or a cold frame. We have found that many seeds of this class of plants are greatly benefited by a steady but thorough freezing. It seems to matter little whether the freezing period be long or short, provided it is steadily maintained for the time being. Seeds of the new *Aquilegia Stuarti* were sown last October in separate pots, the one being kept in the greenhouse and the other placed in a cold frame and frozen. The seeds in the former have germinated but sparingly, while apparently every one in the latter has germinated. The plant in question claims close relationship with *A. glandulosa*, and this is what suggested the experiment, it being well known that freezing is necessary to obtain the best results with that species. *Aquilegia Stuarti* is, however, said to be the finest Columbine in cultivation by the most competent authority. Many of the Columbines are benefited by the above treatment, while others will germinate readily if placed in heat at once. The more one has to do with this most fascinating part of gardening, seed-sowing, the more there seems to be to learn; and I repeat that if it is intended to raise perennials the coming season sow the seed at once, and place all in a cold frame for a week or two, and, if desired, they can later on be placed in heat, and time may thus be gained, or they may be left to germinate with the spring sunshine in the frame.

It is a good plan to sow the seeds, if obtainable, in the fall, and this gives the opportunity to handle the young seedlings during the dull winter months, for when these seedlings are to be cared for later in the season, the pressure of other work often leaves them neglected, and a season's flower is sometimes missed in this way.

The value of frost as an agent in helping seed to germinate is well known, but is capable of much wider application than is generally supposed. In the fall of 1889 we had a quantity of seeds of *Rosa rugosa*, which were sown in flats as soon as ripe and these were placed in a cold frame. That winter being remarkable for its mildness the seeds showed signs of activity early in March, and on being placed in heat they came up so evenly as to raise the covering of soil with them, and thousands of fine young plants were obtained in this way, which, with two years' good growth, would be very valuable young stock, as this Rose is largely used by planters, and quantities are imported annually to meet the demand. Seed of *Rosa rugosa* is somewhat difficult to clean, and to separate the seeds they must be freed from their outer covering; the best way to do this is to cover the hips with water in an open vessel and allow the mass to ferment until the seeds can be easily rubbed out with the hands. The seeds will then float and the refuse will sink. If it is intended to sow them this should be done as soon as the seed is dry enough to handle and treated as above. Cleaning by fermentation is perfectly safe as long as the seed has a hard outer covering.

South Lancaster, Mass. *E. O. Orpet.*

Begonia Scharffiana.—This new Begonia is now in bloom in Mr. B. P. Cheney's greenhouses at Dover, Massachusetts, and the flowers are rather disappointing. The flowering stems are produced sparingly and at uncertain intervals, so that never at one time can it be expected to be an effective and decorative plant, although its handsome foliage will always make it a desirable species and a fit companion for the Rex varieties. The flowering stems are coarse, extending about a foot above the foliage and covered thickly with reddish hairs. The flowers are white, but do not fully open, the larger sepals incurving, so as to give them a globular appearance, and their covering of reddish hairs somewhat mars their beauty.

Wellesley, Mass. *T. D. H.*

Streptocarpus Kewensis is still flowering abundantly, with no sign of ceasing, and it seems worthy of the praise given to it except for its color, which is a light purple and not satisfying. As some of the later hybrids are said to bear flowers of white and varying shades of red, perhaps these may prove more satisfactory in that respect. The crimped leaves are very attractive, and, unlike those of most Gesneraceous plants, do not seem liable to damp off under careless treatment, a point which will commend it to many. The introducers of the new varieties, apparently, do not intend that they shall be common, as their packets contain surprisingly few seed. They are about as small as Begonia seed, and germinate readily under same conditions.

Elizabeth, N. J. *J. N. Gerard.*

Correspondence.

Intelligence in Plants.

To the Editor of Garden and Forest:

Sir.—Ever since reading Darwin's "Climbing Plants," I have wondered why he did not suggest that plants possess something akin to animal intelligence. I beg to narrate an instance which corroborates Mr. Ingersoll's observation in Garden and Forest (vol. iii., p. 318). I once planted a root of the *Ampelopsis quinquefolia* close to a dead Cedar-tree, which stood about five feet from the corner of my house. The vine climbed to the top of the tree, which had been trimmed of its branches, and here its upward growth was arrested. At first it threw out branches about equally in all directions, which bent over symmetrically. Then, as if conscious that in one direction only was anything it could reach, the branches on the side nearest to the corner of the house grew longest.

One branch, larger than the rest, was apparently selected to make the attempt to bridge the distance, and, to aid it, other branches on that side entwined around it, making a kind of rope. The leading branch continued to extend, reaching out its tendrils until it touched the corner of the house, when it fastened its sucker-like disks to the board. Then its supporters, one after the other, applied their tendrils to the house, and all together climbed in various directions until they reached the roof. Meanwhile the branches on the other side of the plant discontinued their growth and remained drooping.

Who that has watched the flower-stalk of the Cyclamen bend over until it buries its seed in the ground, has not been astonished at this intelligent effort? Many instances could be enumerated which are equally surprising, and in view of such cases it seems pertinent to ask why we credit animals with intelligence and do not credit plants with similar faculties?

Chicago. *E. M. Hale.*

The Name of Rhode Island.

To the Editor of Garden and Forest:

Sir.—Permit me to suggest as a more probable derivation of the name Rhode Island than the one given in your issue of December 24th, 1890, that *Rhode* in the old German idioms signifies to throw down, exterminate, clear up a forest, and corresponds to the English words "root out." Is it not possible then that Rhode Island signifies an island which has been cleared of wood? Geographical names with this meaning are common in Germany, Switzerland, England and other countries once covered with forests.

Bale, Switzerland. *H. Christ.*

Any argument that the name of the island of Rhode Island, afterwards transferred to the State, was derived from its being bare of wood seems to rest on mere assumption. According to local tradition, the island was well wooded till stripped of its trees for fuel by the British during their long occupation in the Revolutionary War. The records of the colony there in 1642 also indicate the existence of no small amount of woods, as wolves and deer were then so abundant that Roger Williams was specially appointed to agree with Mi-an-tun-no-my, Chief Sachem of the Narragansetts, as to the killing off of these animals by the Indians.*

The name of the island was not changed by the colonists from Ac-quid-neck to "Rhode Island" till 1644.†

It is also of record that in May, 1650, the General Court at Newport ordered, "That Pes-si-cus (successor of Mi-an-tun-no-my) shall have libertie to gett so many chestnut ryens [rinds or bark] upon the common of the island as may cover him a wigwam—provided he take John Greene with him, that no wrong may bee done to any particular person upon the island."‡

This suggests that not only Chestnut-trees of considerable size were then on the commons of the island, but that there were many others on the portions of the lands already allotted to individual proprietors. It must be borne in mind, too, that the lodge, or wigwam, of the Chief Sachem of the powerful Narragansetts was doubtless the council-house of the nation and no small affair.

The existence of wood on the island at its earliest settlement is further established by the fact that, "At a publiche meetinge held at Portsmouth (1640) there is libertie for men to get a shipp load of . . . . and pipe-staves and clap-board, under directions of the toune of Portsmouth. . . . ." "They . . . . to see to gett plankes and . . ."§

Further, in relating the settlement of this island, Arnold says: "The earliest export trade of Rhode Island was in lumber. The home prices were regulated by law. In the earliest enactment (January, 1639) these are fixed at eight shillings the hundred for sawed boards, seven shillings for half-inch boards delivered at the mill, and one shilling a foot for clapboards and fencing, to be sound, merchantable stuff." Timber was not to be cut "or exported without a license."‖

This was at Newport, the south end of the island, while the ship-load of lumber, "pipe-staves and clapboards," referred to above, was taken from Portsmouth, at the north end, about the same time.

It was also ordered at Newport in 1641, "That no fiers shall be kindled by any whatsoever, tu runn at randome, eyther in Medows or Woods."*

Arnold says: "The derivation of the name has given rise to much discussion, and that it is difficult to imagine by what strange fancy it was ever supposed to resemble the Island of Rhodes on the coast of Asia Minor, and that it is equally strange such a tradition should be believed, except that it is easier to adopt a geographical absurdity than investigate an historical fact."

Verrazano, in the service of Francis I., explored the coast and spent more than two weeks, in the spring of 1624, in the spacious harbor of Newport. His narrative of an island resembling the island of Rhodes refers distinctly to Block Island, which may be thought to resemble the Mediterranean island. But to this island Adrian Block, the Dutch navigator, gave his own name. Afterwards, like his Italian predecessor, he sailed into Narragansett Bay, and commemorated the ruddy aspect of the place, caused by the red clay in some portions of its shores, by giving it the name of '*Roodt Eylandt*' (Red Island) and by easy transition Rhode Island."†

Providence, R. I. *William D. Ely.*

* "Bart. Col. Rec. R. I.," p. 124.
† "Idem," p. 127.
‡ "R. I. Col. Rec.," I., p. 225.
§ "Bart. Col. Rec. R. I.," p. 74.
‖ Arnold's "Hist. R. I.," I., 142.

* "R. I. Col. Rec.," I., p. 114.
† Arnold's "Hist. R. I." i., p. 70; Note.

Meetings of Societies.

The Western New York Horticultural Society.—II.

IN addition to our report of last week we give abstracts of a few more of the addresses delivered. No prizes were offered for fruit, but there was a remarkable display of apples, pears and grapes, notwithstanding the unfavorableness of the season. The advantages which fine exhibitions of fruit bring to fruit-growers, and the educating influence of such exhibitions upon the public, were discussed, and a committee was appointed to confer with the State Agricultural Society in order to secure the offer of such premiums for excellence in various fruits as would ensure a creditable display at the state fairs.

FRUIT-GROWING IN CANADA.

Professor William Saunders, director of the Experiment Stations in the Dominion of Canada, made an informal address on Fruit-Growing in Canada, from which we quote the following paragraphs:

"A few years ago it was decided to establish five experiment farms in various parts of the Dominion. These included a central farm at Ottawa and four others, making altogether 2,200 acres, under a common management. On Prince Edward Island are some of the best farms of Canada, and the system of rotation of crops—a seven-year system—is superior to any other system in America. The climate is very favorable to the production of apples. Nova Scotia likewise has a large area which is one of the best Apple-growing districts in eastern America. There is an unlimited demand for the fruit grown here, and the orchards are very profitable. The climate is very favorable for the production of cherries. During the late war some emigrants from western New York took cherries with them, and a great variety of promising seedlings has resulted from this introduction. The Bear River district has become noted for its cherries, producing them in great abundance. Peaches, also, contrary to what would naturally be expected, ripen nine out of ten years. The fruit interests are capable of being developed a hundred-fold without overdoing the business. One of the government experiment farms is located near the centre of Nova Scotia, which has a climate much milder than that of Ontario. Our Nova Scotia farm-experiments are devoted largely to apples and small fruits. A thousand miles west of this farm is the central farm at Ottawa. In addition to the usual experimentation in dairying and stock-raising at this farm, the entire work of a botanical, chemical and entomological nature is done for all the other farms, all questions of this character being referred by them to the

central farm at Ottawa. Notwithstanding the short period since the establishment of this farm, we have succeeded in getting a large number of varieties of fruits for testing. In addition to many varieties of standard American apples there are over 200 Russian varieties being tested and 3,000 seedlings, the seeds of which were collected from the best fruit obtainable near the northern limit of apple-production in Russia. In addition to the apples, we are testing many varieties of pears, plums and small fruits. Sixteen hundred miles west from Ottawa in Manitoba, near the town of Brandon, is the next experiment farm, part of which lies in the valley of the Assiniboin River. Here many experiments in forestry are taking place. The next farm is 200 miles farther west, lying in a dry belt of country, swept by hot winds from the south, thus giving very different climatic conditions from the farm next east of it. The most western farm is 1,500 miles farther on, near the Pacific coast. The climatic conditions in this territory of British Columbia are difficult to understand.

"Within twenty-five miles there is a change from a rainy climate similar to that of England to a rainless district just as there is in Washington upon the other side of the line. Here fruit-growing can be carried on with the greatest promise, most of the plant diseases of the Atlantic states being unknown here. The climate is especially good for apples and pears, which possess a peculiarly fine flavor. In Manitoba and Assiniboin, fruit-growing is difficult. The soil is so rich that the trees grow vigorously throughout the summer and fail to ripen their wood sufficiently to endure the rigorous winter. For this reason it is difficult to make even the hardy Russian trees succeed, and eastern trees are of no use whatever. We have yet to determine what fruits can be adapted to this region. A few Russian Cherries and Apples have grown fairly well. An important condition of fruit culture here is that of shelter, and with this aid trees develop an unexpected degree of hardiness, so that we feel that there is much to hope for from this source. The wild Raspberry grows well here, and Currants and Gooseberries also are quite successful.

"One of the most valuable lines of experiment work for these various farms seems to be the testing of all attainable varieties, as sometimes trees, from which it would not be expected, prove successful in our climate. In Manitoba, for example, very good specimens of the Wealthy apple have been grown.

"These farms are visited by hundreds of farmers who seem anxious to learn the results of these various experiments. Having observed that the forest-trees were very fruitful this year, a large collection of tree-seeds was made at the various farms, and these have been distributed in small packages through the mails to farmers throughout the Dominion."

HISTORY AND CURRENT PROGRESS OF ECONOMIC STUDY OF PLANT DISEASES.

In an instructive paper on this subject Professor A. N. Prentiss stated that while early writers on agriculture noticed the occurrence of diseases of plants, several chapters of Pliny's Natural History being devoted to the diseases of trees, the remedies suggested were all in the line of superstitious beliefs and practices. No real progress was made in the knowledge of this subject for centuries. Without referring to the history of the economic study of plant diseases in the Old World, Professor Prentiss went on to say:

"The first meritorious work of this kind in the United States appears to have been a paper on the diseases of the Grape, by Dr. Engelmann, in 1861. It was not until 1876 that Dr. W. G. Farlow's exhaustive study of the Black Knot was published.* This must be regarded as the first paper which, while possessing the highest merit as a biological study, was also of much value in its practical bearings. For as a rule the first step to be taken in gaining a knowledge of the proper method of combatting a plant disease is to acquire a thorough knowledge of the parasitic Fungus which is its cause. This paper of Dr. Farlow's was speedily followed by other important contributions by the same author. In our own state the work of the State Botanist, Mr. C. H. Peck, begun in 1868 and continued to the present time, has been of great importance. The work of Dr. J. C. Arthur on plant diseases at the Geneva Station in 1884–1887, largely of a practical and experimental nature, is well known. Nor should we forget to mention the researches of Dr. Burrill, especially on the Pear Blight, which established beyond doubt the cause of that destructive malady.

"No organized work of any importance was undertaken by the General Government until 1885. In that year was established the efficient section of Vegetable Pathology of the National Department of Agriculture. The work of this division, carried on by Professor Scribner from 1885 to 1887, has since been under the direction of Mr. Galloway. The division has now grown into large proportions, with a number of assistants and agents. Valuable information has already been widely disseminated, which, while touching all branches of agriculture, is of principal value to the fruit-grower.

"The most recent advance in the way of special work in the field of our present inquiry, is that of the experiment stations organized in every state under the Hatch Bill. In the published report of these stations no less than eighteen of them mention the Fungus diseases of plants as one of the most important subjects of investigation. Of course, provision for this work is no where completely adequate. Indeed, if the energies and funds of a station were wholly devoted to this subject, the ground could not be completely covered. The vastness of the field may be indicated by noting the number of Fungi which live upon almost any one of our cultivated plants. Thus, no less than fifty species are recorded as living upon a single species of Grape (*Vitis Labrusca*); on the Peach, twenty-eight; and on the common apple more than eighty.* Not all of these are parasites preying upon the living plant, and of these only a comparatively few are known to be to any important degree injurious; but no one can say when any one of them may not spring into prominence as causing plant disease, owing to changed climatic conditions or other obscure or unknown causes. The contributions that have thus far been made to our subject by the experiment stations could not in the very nature of things been very great; but a beginning has been made, and we must not be too impatient for results. An examination of the bulletins of the several stations for 1889 shows that some twenty papers were published. These vary greatly in extent and value, those of the Cornell Station, so far as fruit-growing interests are concerned, occupying the first place in point of merit and importance.

"As a further indication of the hold which the subject has on the public mind, it may be stated that laws intended to prevent the spread of plant disease, or looking to its suppression, have been enacted by some of the states, and the subject has been more or less agitated in others. How efficient these laws are, or may become, can only be ascertained by experience. Besides this, the subject is now receiving attention in all of the more prominent agricultural, horticultural and even botanical journals. During the past year many valuable contributions have been made, and in at least one of our horticultural journals a special department, fully abreast of the times, in which the articles are well written and admirably illustrated, is maintained.

"In the line of remedies for Fungus diseases only a single general method, varying more or less as to the details of its application, appears to be of unquestioned benefit. The underlying purpose in all cases is to destroy the germ or spore from which the injurious Fungus springs. The method consists of treating the affected plant with some preparation which, while not injuring the plant to any material degree, destroys the parasite. A very considerable literature is now available which discusses the best substances to be used and the best methods of application. While the operations called for are not especially difficult, the work can best be accomplished by those who have acquired skill in the matter by study and experience. It may therefore transpire that in time every community will have some one person, well equipped with suitable apparatus and material, who will make it a business to perform the work for the fruit growers of his region to the profit of all concerned."

The Committee on Ornamental Plants advised a more general planting of native trees and shrubs, and they recommended among promising novelties the following: A golden form of Hop-tree (*Ptelia trifoliata*), which is easy to transplant and is said to retain its color better than any other shrub or small tree, its foliage remaining a pure yellow until November; a pendulous form of the American Elm found in Cayuga County by Mr. Henry A. Morgan, and which is represented as growing with an upright trunk and long, drooping branches which have abundant foliage; the form of Black Locust which has foliage resembling the Mimosa, and which, with a large number of other varieties of this American tree, originated in Europe; a purple form of the Weeping Beech, and a sport of Nordmann Fir, which has yellow shadings on its dark-green foliage.

Mr. C. A. Green, in speaking of the value of improved varieties of fruits, gave some figures to show that the Concord

*The Black Knot. W. G. Farlow. *Bulletin of the Bussey Institution*, 1876.

*A Provisional Host Index of the Fungi of the United States. W. G. Farlow and A. B. Seymour. 1888–1890.

Grape has been worth at least $50,000,000 to the country. He added that the improvement in Strawberries had been most marked, and at an exhibition of seedlings at the Geneva Experiment Station last summer there were hundreds of varieties of such a high average excellence that a grower might safely have taken plants at random and secured a good collection. Our wild fruits offer a tempting field for experiments. It is only a few years since the Black Raspberry was domesticated; the Juneberry and High-bush Cranberry are already on trial. Dried elderberries are now sold at the groceries, and the fresh fruit was sold in the streets at paying prices last year.

Last year Mr. George Ellwanger gave the Society $1,000, with the provision that its annual income be devoted to prizes open to members of the Society. The committee to whom the matter was entrusted reported the establishment of the Ellwanger prize, which is to be awarded to the owner of the best maintained private place, special reference being had to the planting and general treatment of the grounds. The Barry medal, costing $50, will be awarded to the originator of the new fruit, ornamental tree, shrub or herbaceous plant or vegetable which, in the opinion of the committee, shall have the highest value.

In the report of the Grape Committee, Mr. W. C. Barry named as the six varieties which possessed the most decided value for western New York: Lady, Niagara, Barry, Concord, Worden and Gaertner.

Notes.

Professor S. T. Maynard states, on the authority of the Entomological Division of the Department of Agriculture, that the loss to the farming interests, including all its branches, for the past year from insects and fungi amounts to four hundred millions of dollars.

A comparison made at the Ohio Experiment Station for two years between male Asparagus-plants and female plants show that the former are earlier and more productive, and have a higher market value on account of the larger size and finer appearance of the shoots.

The fact that Grape-vines suffer from disease in so many parts of the world seems less surprising than the fact that they ever are in health when we read, on the authority of Von Thüman, a German expert, that 323 species of Fungus parasites have been recognized on *Vitis vinifera*.

The death is announced at Lyons, in his eighty-seventh year, of Jean Sisley, one of the most famous French horticulturists of the century, and known wherever plants are cultivated for his success in the production of new varieties of Roses, Tree Carnations, and especially of Cannas. More than any one else he made Lyons one of the centres of horticulture in Europe.

Elwes' Snowdrops have been in bloom in open borders for a fortnight, and their appearance is most grateful in this wild February weather. They were three weeks earlier in the exceptionally mild winter a year ago. Plants of *Galanthus nivalis Imperati* we have also seen flowering in a cold exposure. In a warmer border they would have been nearly as forward as *Galanthus Elwesii*.

A recent issue of *Le Jardin* contains a portrait of Victor Lemoine, the famous horticulturist of Nancy, with a list of the principal plants which he has originated in his long and successful career as a hybridizer. The list includes the double-flowered Portulaca which he raised in 1851, and many Clematis, Begonias, Lilacs, especially the double-flowered varieties, and Gladioli. M. Lemoine, who was born in 1823, is still active, and is as enthusiastic and eager in his favorite pursuit as at any time in his long career.

Governor Tuttle, of New Hampshire, recently called attention to the work of the Commissioner of Immigration, in consequence of which "more than 350 abandoned farms have been repopulated, mainly by Americans, and the business of summer entertainment has largely increased." The Legislature of the state has been asked by the Commissioner for an appropriation to pay for the preparation and circulation of a pamphlet describing and illustrating the attractions of New Hampshire as a summer resort, saying that "from the best statistics at our command there have been left in the state by summer tourists during the year more than $5,000,000," and that "a large portion of this has been left with the farmers."

It may now be considered as a well-established fact, says the *Botanical Gazette*, that vegetation exerts a definite and easily demonstrable drainage action on the soil. Ebermayer's earlier researches have shown that more water penetrates the soil of shaded regions than into that of naked fields. By some recent researches he shows that, while the surface portions of the soil in a forest is moister than open fields, this is not true of the deeper parts within the range of the roots of the trees, for this is distinctly drier. For example, at a depth from eighteen to twenty inches in a Fir forest of sixty-year-old trees the percentage of water is 15.12, as against 19.89 in naked soil. He has also determined that in soil covered with young trees (six years old) the loss of water by transpiration is intermediate between that from soil covered by mosses and that covered by grass.

The Brooklyn Society for Parks and Playgrounds has issued a circular calling attention to the law of this state under which it is incorporated and which makes it possible for the citizens of any town to associate for the purpose of providing recreation grounds for children and others. An association has been formed in this city, and it is desirable that similar ones should organize in other parts of the state. Ample and well-planted school-grounds, which will not only afford space for play but will insure abundant air and light in the school-building, are of vital importance to the health of the young, and liberal space should be provided in anticipation of the rapid growth of our towns and the increasing school population. We have already given the provisions of this law, but all persons who desire fuller information will receive a copy by addressing the Secretary of the Society, Mr. E. O. Ball, 43 Lee Avenue, Brooklyn, New York.

Mr. John Thorpe delivered a practical and interesting address on Chrysanthemums before the Massachusetts Horticultural Society last Saturday. He said that if the production of fine blooms was the chief object aimed at, the plants should be grown under glass continuously; they should be started in May, grown on in pots until they are planted on benches in late June or July. Recognizing the greatly increased number of varieties offered yearly, he urged the necessity of much greater restrictions in the matter of awarding prizes and certificates for seedlings. Out of the 120 American seedlings to be distributed this spring he thought it probable that only twenty-four of them would take rank with the best when the flowering season comes round again. Early-flowering varieties were considered very desirable, but the lecturer expressed the belief that, with very few exceptions, the early sorts which afford so much satisfaction in Europe would not succeed here. It was his opinion that if early varieties suitable to the American climate are to be had they must be raised in this country. He does not consider a blue-flowered Chrysanthemum outside the range of possibility, and argued that a sport may produce it. One of his hearers having attributed the decline of the outdoor cultivation of Chrysanthemums to the ravages of insects which render good growth impossible, Mr. Thorpe stated that the pests can be held in check by syringing the plants, while growing outside, twice a week with a solution of one ounce of bitter aloes in four gallons of water.

Catalogues Received.

Joseph Breck & Sons, 51, 52 and 53 North Market Street, Boston, Mass.; Vegetable and Flower Seeds, Agricultural Implements.—William Bull, 536 King's Road, Chelsea, London, S. W., England; Select Flower and Vegetable Seeds, Bulbs, etc.—A. D. Cowan & Co., 114 Chambers Street, New York; Garden, Farm and Flower Seeds.—De Lamater Iron Works, 21 Cortlandt Street, New York; Ericsson Hot Air Pumping Engine, The Improved Rider Compression Pumping Engine.—Ellwanger & Barry, Mount Hope Nurseries, Rochester, N. Y.; Wholesale Catalogue of Small Fruits, Fruit and Shade Trees.—V. H. Hallock & Son, Queens, N. Y.; Flower and Vegetable Seeds.—Herm. A. Hesse, Weener, Hannover, Germany; Nursery Novelties.—George S. Josselyn, Fredonia, N. Y.; American Grapevines and Small Fruit Plants.—John R. & A. Murdoch, Pittsburgh, Pa.; Flower and Vegetable Seeds, Fruit and Ornamental Trees, etc.—William Parry, Parry, N. J.; Small Fruits, Fruit and Ornamental Trees.—Phœnix Nursery Co., Bloomington, Ill.; Wholesale Catalogue of Trees, Shrubs, Roses, Bulbs, etc.—Pitcher & Manda, United States Nurseries, Short Hills, N. J.; Souvenir and Descriptive Catalogue of the Great Flower Show held at Madison Square Garden, New York, Descriptive Catalogue of Chrysanthemums and Single Dahlias.—Dr. H. Shroeder, Bloomington, Ill.; Grapevines, Fruit Trees, Small Fruits.—William Stahl, Quincy, Ill.; Fruit Trees, Plants and Vines, Excelsior Sprayer and Spraying Pump.—W. Thompson, 34 and 36 Tavern Street, Ipswich, England; Choice and Rare Flower Seeds.—Thomas S. Ware, Hale Farm Nurseries, Tottenham, London, England; Novelties in Dahlias, New Chrysanthemums, Vegetable and Flower Seeds.

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An Experiment in Forestry.

THE Adirondack League Club, of which we have before spoken, owns a hundred square miles of timber in a compact body on the south-western outskirts of the mountain region of the wilderness. Some Beech and Black Spruce are mixed with the prevailing Birch and Maple, which here attain magnificent proportions, and scattered among them are small quantities of White Pine, Fir, Tamarack and Hemlock, besides single trees of Black Cherry and Elm, with Black Ash on the swampy land. The quality of the timber is said to be excellent; Birch-trees, which are three or four feet in diameter, as well as the tall, straight Spruces, are still vigorous and healthy. This region is within easy reach of the greatest lumber markets of the east, with waters capable of floating soft wood and a topography which admits of easy grades for roads, so that it offers good advantages for carrying on lumber operations and for intelligent forest-management. The lands of the Club have recently been inspected by Mr. B. E. Fernow, of the Forestry Department at Washington, and, if the recommendations in his report are adopted, the people of the United States will have for the first time a practical object-lesson in the management of their woodlands, according to the established principles of forestry. The tract offers a favorable field for such an experiment, for it is sufficiently large, and it contains a large amount of available and valuable material uninjured by fire, and within an accessible distance of good markets.

Bearing these facts in mind, Mr. Fernow's report is one of exceptional interest and value, in that it brings out clearly what the true function of forestry is, and it sweeps away some of the misconceptions that are almost universally prevalent, and which must be corrected before any successful forest-management can be established in the United States. Systematic forestry is a business carried on for profit in the production of wood-crops, just as agriculture is practiced for the profitable production of food-crops. Attention to this primary object does not exclude other considerations, such as the preservation of our water-supply and of certain climatic and soil conditions. Indeed, forest-management for profit and forest-preservation for other reasons may be in certain localities harmonious, but economic forestry in a wooded country means primarily the utilization of a wood-crop in such a way that the original growth, or a forest of trees superior to those of the original growth, will be reproduced with the least expense. The operations of the lumberman and of the forester differ in that the forester cuts his trees with the view to secure a desirable reproduction, while a lumberman cuts them without such forethought. The efficient management of a forest like the virgin tracts of the North Woods requires no planting unless it is desired to introduce new species, or unless clearing out and replanting appears profitable, and the most successful way of perpetuating the forest. In order to secure continued wood-crops, the forester takes advantage of the constant struggle for supremacy that is going on among the different trees of a wood. One species will gain a foothold by prolific seed-production, another by its dense shade, which will kill out its rivals, a third by a vigorous root-system, which enables it to endure the shade and bide its time until light is let in to give it aid. Different kinds of trees and the same species at different periods of its life have different needs in regard to light and other influences, and it is the practice of the trained forest-manager to assist the desirable kinds in their struggle for existence, to check the undesirable kinds and to create such conditions of soil and light as will improve the composition of the forest as it is reproduced, and secure for it the most profitable growth.

Hitherto prudent forest-management, looking toward continued reproduction, has not existed in this country, and therefore forest-property has had only a temporary value. The lumberman's practice has been to secure the valuable timber as quickly as possible, and leave the rest to rot, or burn, or deteriorate. So long as there are virgin forests to attack, the lumberman finds the greatest immediate profit in stripping one tract of its most salable timber, and then abandoning it to invade another. The owner of a large office-building will expend in repairs a part of his income from its rent in order to improve its future productive value, but the owner of a forest will not sacrifice a part of his present profit in the interest of a permanent investment. He operates his timber-tract so as to insure the quickest returns, and when it is exhausted he buys more land. Of course there must be a limit to such short-sightedness and extravagance. When that limit is reached the lumberman as we know him will give place to the forester, of whom we have heard. The man who plans for the future will supersede the man who works for the present.

This day may be nearer at hand than many of us imagine. At all events it is none too early to begin preparation for it. We have acquired great skill in the methods of forest-destruction; we know practically nothing of the best means of forest-reproduction. The ability to direct and modify and control the growth of a great forest can only be acquired by study and practice. This technical knowledge must be adjusted to the ever-changing commercial aspects of the forest as new uses are found for wood products and new markets opened. The managers of our future forests, plainly, must be men of sound judgment born of wide experience. It is to be hoped, therefore, that the Adirondack League Club will not be diverted from its purpose to carry on its proposed experiment. Let us have one example of a forest managed as a permanent investment. In other countries such ventures have proved profitable. The state forests there are not public burdens, but they help to pay the taxes, and it is not improbable that if the state of New York could buy the land in the proposed Adirondack Reservation at a reasonable price it could be made to pay as a business investment if placed under proper administration. The experiment to which we have called attention ought to furnish data which will help in

solving questions of this sort. At all events it ought to give Americans the unique opportunity of seeing a forest which is not in danger of being devastated and then abandoned, but which is looked upon as a property of ever-increasing productiveness and value—a forest in which the lumber camp and shanty and the temporary road give place to houses for constant occupancy, well-laid roads and permanent constructions for a scheme of operations which looks to the distant future. Not to speak of the educational value of such an establishment, its moral effect would not be inconsiderable. When the function of a forest as a source of production which is never to fail comes to be generally understood the public indignation at forest-destruction will be quickened. It will not seem a trifling or venial misdemeanor to fire a property which is growing in value under the expenditure of much thought and labor and money. Our forests will be guarded from destruction when the people understand how much they are worth, and an object-lesson in successful forest-management will be of signal assistance in spreading a popular appreciation of their value.

The Forsythia as a Pillar Plant.

THE illustration on page 79 represents the front of the entrance lodge of Mr. Hunnewell's estate at Wellesley, Massachusetts, draped with plants of *Forsythia suspensa*. It is published for the purpose of showing the value of this beautiful and well-known Japanese shrub for covering porches and arbors, and for training to pillars, for which purposes its long, flexible, pendulous branches admirably adapt it. There are, indeed, few plants capable of supporting the rigors of our northern winters which are so well suited to ornament the garden in this manner; and there is not in all the long list of our hardy shrubs a single one which produces year after year a greater wealth of brilliantly colored flowers and of dark-green, lustrous, handsome leaves, or which grows more freely and vigorously, or is less liable to the ravages of disease and of noxious insects. This plant is easily propagated by seed, which in some seasons is produced in large quantities, or by cuttings, which root very freely. Every branch when it touches the ground produces roots, and broad thickets are soon formed from which young rooted plants can be obtained. These planted in rich soil will grow, in the course of two or three years, into broad masses six or eight feet high.

Recent Botanical Discoveries in China and Eastern Burma.—I.

IT is now nearly eighteen months since I finished a series of articles in GARDEN AND FOREST on recent botanical discoveries in China. Since the last of that series was written Kew has received further consignments from D. A. Henry, partly from central and western China and partly from the little-explored island of Hainan, an island of considerable size in the extreme south-east of China, situated within the tropics. The collection from central and western China, mainly from the provinces of Hupeh and Szechuen, consisted of about 2,700 members, and probably not less than 1,500 species, including many new ones, to say nothing of new generic types. The collection from Hainan consisted of about 750 members, but was less interesting horticulturally. Since then, too, Forbes & Hemsley's "Index Floræ Sinensis" has been published down to the end of the gamopetalous orders, and some progress has been made with the apetalous orders. Further, the writer has assisted General H. Collett in working out an interesting collection of dried plants made by the latter in the southern Shan Hills, Upper Burma. Mr. A. Franchet has published three parts of the "Plantæ Delavayanæ," a marvelously rich collection from the province of Yunnan; and Mr. Maximowicz has made some important contributions to the flora of central Asia, north-western China and the contiguous territories from the collections of various Russian explorers, notably of Przewalski and Potanin. Although highly interesting botanically, these plants, generally speaking, are not of an ornamental character. In addition to these partly described collections, Kew has lately acquired a valuable collection made by Mr. A. E. Pratt in western Szechuen on the Thibetan frontier, at elevations of 9,000 to 13,500 feet. From a cursory examination this last collection promises to be equally as rich in novelties as any of the preceding.

When the late Dr. Asa Gray wrote on "Forest Geography and Archæology" about twelve years ago he drew some comparisons between the composition of the forests of the Atlantic and Pacific states of North America, and contrasted the American forests with the European and with those of the extreme east of Asia, eastern Mandshuria and Japan. The principal results of Gray's investigations were the relative great poverty of the forests of the Pacific side in deciduous trees as compared with the forests of the Atlantic side; the general poverty of the European forests having regard to the number of different genera and species represented in their composition, and the surpassing richness in genera and species of the extreme east of Asia, especially when taking into consideration the smallness of the geographical area. Dr. Gray computed the arborcous element in the flora of Japan and eastern Mandshuria and the adjacent borders of China to consist of sixty-six genera (nineteen coniferous and forty-seven non-coniferous) and 168 species, of which forty-five were coniferous. His estimate of the arboreous element in the European flora was just about half these numbers; but it was probably a little too low. Be that as it may, the estimate for eastern Asia was not too high; and Gray was of opinion then that the figures given were not exaggerated, and were much more likely to be sensibly increased by further knowledge than were those of any of the other regions. Subsequent botanical explorations in China have emphasized the wealth of the forests of temperate Asia. In central and western China what may be termed Japanese and Himalayan types overlap, the latter predominating. By types I do not mean identical species, for the majority are local, but species of the same genera, facies and character.

Not the least interesting among these recent collections is that alluded to above from the Shan Hills, in Upper Burma, the results of General Collett's spare moments. One of the most remarkable features in the Shan Hills flora is the predominance of plants belonging to genera characteristic of temperate regions, and this at elevations of about 4,000 feet above the level of the sea and within the tropics!

Before proceeding to an enumeration of the more noteworthy plants of the Shan Hills it may be well to say a few words respecting the climate, physical features and general character of the vegetation, extracted from General Collett's observations recorded in our joint report, which lately appeared in the *Journal of the Linnean Society of London*.

The area in which the bulk of the collection was made lies between the nineteenth and twenty-second parallels of north latitude, and is bounded on the east by the Palween River and on the west by the plains of Upper Burma, and consists of several distinct ranges of hills running north and south and rising in occasional peaks to a height of 6,000 or 7,000 feet, and enclosing table-lands of 3,000 to 4,000 feet above the sea-level. Along the western border of this mountainous region is a belt of jungle or forest of tropical composition. Up to about 2,000 or 2,500 feet of elevation the forest is dry, the soil poor, the trees stunted, and fires are of frequent occurrence. At an elevation of about 2,500 feet, and up to 3,500 to 4,000 feet, there is a great change in the character of the vegetation, owing partly to greater humidity, partly to a lower temperature. The trees are larger; Mosses, Lichens and Ferns abound; the hill-sides are covered with undergrowth, and numerous trees and herbaceous plants appear that are not found at lower levels: such are Quercus, *Schima Wallichii* and two or three of the arboreous compositæ of the genera Vernonia and Leucomeris. From the gloomy depths of this forest the traveler passes, by one step, as it were, on to the open breezy table-land intervening between the skirt of the forest and the next range of mountains; and the sensation is a pleasant one, after days of toilsome marching along narrow pathways cut through the dense jungle, where the atmosphere is stagnant and the view restricted to objects immediately at hand. Rolling grassy hills open before one, studded here and there with clumps and solitary trees of Oaks and Pines, and carpeted with low flowering shrubs and charming herbaceous plants. The presence at elevations of only about 4,000 feet of such genera as Thalictrum, Anemone, Ranunculus, Delphinium, Viola, Silene, Stellaria, Hypericum, Polygala, Impatiens, Agrimonia, Poterium, Epilobium, Œnanthe Galuim, Echinops, Primula, Swertia, Fraxinus, Pedicularis, Mentha and Ajuga will give an idea of the temperate character of the flora. Of course it does not follow that the species there found of the genera just enumerated would prove hardy in the climate of either New York or London. Indeed, the probabilities are that they would not; but General Collett collected a good many novelties that would well deserve the shelter of a greenhouse. His whole collection contained up-

ward of 800 species of flowering plants, belonging to very nearly 500 different genera and 110 natural orders—proportions only paralleled in some insular floras. It is not supposed, however, that these figures represent the true proportions of species, genera and orders in the whole flora of the Shan Hills, though the only kind of selection exercised in forming the collection was the exclusion of common and familiar weeds.

Kew. *W. Botting Hemsley.*

Notes on North American Trees.—XXIII.

45, *Rhamnus Caroliniana.*—This name of the arborescent Rhamnus of the eastern states was published in 1787. Miller, in the eighth edition of his "Gardeners' Dictionary," published in 1768, describes a *Frangula Americana*, which is perhaps this plant. Miller's description, however, can as well be applied to *Rhamnus alnifolia*, to which De Candolle ("Prod." ii., 25) doubtfully referred it. Unless, therefore, the identity of *Frangula Americana* with *Rhamnus Caroliniana* can be satisfactorily established, Walter's name should be retained.

47, *Rhamnus Purshiana.*—The black-fruited Buckthorns of the Pacific coast have lately been critically studied by Professor H. H. Rusby, of the College of Pharmacy, New York, who has contributed an important paper on the subject to the *Druggist Bulletin* for October, 1890; and by Mrs. M. K. Brandegee, the curator of the botanical department of the California Academy of Science, who has had excellent opportunities to study these plants in the field, and who has most obligingly communicated to me a large number of specimens collected in different parts of California and Oregon. The two working independently arrive at quite different conclusions with regard to the specific rank of the two plants known as *Rhamnus Purshiana* and *R. Californica.* Professor Rusby finds sufficient ground for keeping these two plants specifically distinct, and later investigations lead him to consider not only these two distinct, but incline him to give specific rank also to the pubescent form of the Mexican boundary region to the mountain form characterized by Mr. Greene as *Rhamnus rubra*, and to what seems a small-leaved form of the northern *Rhamnus Purshiana* distributed several years ago as *R. occidentalis* by Mr. Thomas Howell, of Oregon. The principal differences Professor Rusby finds in these plants are: the ordinarily greater size of *R. Purshiana*; the length of the petioles, which "are commonly two or three times as long in *R. Purshiana*," and in the leaves, in which he finds the chief distinguishing characters. "Those of *R. Purshiana*" he describes as "from two to six inches long, broadly elliptical, the base occasionally slightly cordate, but generally rounded or very slightly produced, and the apex rounded or very shortly pointed. The margin varies from nearly entire to slightly crenate and finally serrate. They are deciduous, thin and veiny; green on both sides, but somewhat paler below. The lower surface is densely and softly hairy, the veins hirsute. The upper surface is softly hairy when young, but becomes smooth, or nearly so, except within the strong channel along the midrib, which remains reddish or whitish-hirsute," while the leaves of *Rhamnus Caroliniana* "are only half the length of the last, elliptical-oblong or obovate, rounded or slightly heart-shaped at the base and occasionally short-pointed. They are often rounded at the apex, the margins varying from densely serrate to almost entire. They are thick and persistent, and generally evergreen. The under surface is strongly reticulate, reddish-veined, and the primary veins not nearly as numerous, straight or fine as those of *Rhamnus Purshiana.* Above the channel of the midrib is shallow and inconspicuous and smooth within, or there may be none. In this channel of the midrib I seem to have found an excellent characteristic." But it is in the structure of the bark of the two plants revealed by the microscope that Professor Rusby finds the unfailing guide by which they may be distinguished. "The characters and arrangement of the bast bundles, resin areas and medullary rays form quite as good evidence as do the leaf characters above detailed, and guide us to the recognition of the barks alone, which the leaf characters cannot do. The general structure of both exhibits medullary rays supported on either side with small bast bundles, circumferentially elongated, of an elliptical form. Of these there are sometimes two side by side between two medullary rays, while at other times a single large one reaches from one medullary ray to the other. In *Rhamnus Californica* they are more likely to occur in pairs. At the region where the medullary rays terminate, and extending from there to the corky layer, begins a zone of very large resin spaces of variable size and form, but many times larger than the bast bundles, which in appearance resemble them very closely indeed."

Mrs. Brandegee (*Zoe.*, i., 240), who passes over the characters based on the nature and the arrangement of the bast bundles, resin areas and medullary rays of the bark, with the remark "that their value in classification is yet to be tested, even if they hold good through large series of specimens, as in those of the writer, at least, they fail to do, and that there is no reason why these characters should not vary with age, exposure, climate and luxuriance in the same manner as the leaves do," finds that the only differences in different individuals from different parts of California consist in the form, texture and coating of the leaves, and that connecting the extreme forms are many intermediate ones, that the number of the nutlets (three in *R. Purshiana* and two in *R. Caroliniana*) which has always been depended on to separate these plants is of little value. These species, certainly, like all others of the genus, have sometimes two and sometimes three-seeded fruit. Mrs. Brandegee points out also that the red color of the bark of the branches, a character partly relied on by Professor Greene to distinguish his *R. rubra* (*Pittonia*, i., 68), is by no means unusual, plants not otherwise distinguishable being found in the same neighborhood, some with red and some with green-barked twigs. Of the southern tomentose form (*R. tomentella*), which Professor Rusby considers specifically distinct, Mrs. Brandegee says it "furnishes one of the strongest arguments for the specific identity of *Rhamnus Caroliniana* and *Rhamnus Purshiana.* It runs in the northern part of Lake and Collusa Counties into broad-leaved forms, which apparently bear the same relation to *Rhamnus Purshiana* that the southern *R. tomentella* does to *R. Californica.* It can hardly be supposed that if the species are distinct each can have a variety *tomentella* varying in the same manner as the species."

I have examined a large number of specimens gathered in all the great region where these plants are found, from the shores of Flat Head Lake, in Montana, through all the Pacific coast region to Mexico, and I confess, although it is several years since I have seen the plants growing, except in cultivation, I can find no characters which can be depended on to distinguish the described species. In all the essential characters upon which botanists depend to separate one species from another, *Rhamnus Purshiana* and *Rhamnus Californica* are the same—in external appearance of bark and in wood, in flowers and fruit, and in the color of the branches. This last is a character of little value, as in Oregon as well as in California it is sometimes red and sometimes green.

The only variation recorded in the structure of the flower is that noticed by Mr. Greene, in his *Rhamnus rubra*, the petals of which he describes as "externally setulose-hairy below the middle," a peculiarity which we cannot detect in the dried flowers he has sent to me; while the filaments described by him as deltoid are not apparently thickened at the base more than those of other flowers from California and from Oregon. Professor Rusby's character, based on the structure of the bark, would seem to require confirmation by the examination of a very large number of specimens gathered in all parts of the region occupied by this plant and from individuals growing under different conditions of soil and exposure. Until this has been done it hardly seems safe to depend upon it to separate species

otherwise not readily distinguishable. While there is no difficulty in distinguishing the extreme forms, these are connected by so many intermediate forms that it does not seem practical to characterize them specifically or even to find satisfactory varietal characters except in the case of the plant of the Mexican boundary region, which is distinct in the character of the tomentum which covers the branches and lower surface of the leaves.

In the humid atmosphere of the north-west coast-region and of the northern Rocky Mountains, where *Rhamnus Purshiana* grows in the dense shade of coniferous forests, it becomes a tree with slightly pubescent bright red or green branchlets and large, thin, broadly elliptical, obtuse or abruptly pointed deciduous leaves, sometimes hairy on the upper surface and on the principal veins below, with short pubescent petioles and prominent veins. In the less humid climate of central California the leaves are semi-persistent, usually thicker and smaller, sometimes lanceolate and acuminate. The pubescence increases as humidity decreases, the principal veins appear less prominent and their reticulation is more apparent; but in central California individuals occur in favored localities with the large thin leaves with the prominent straight veins of the northern plant, while near them are found others with the narrow coriaceous leaves of the more common California form. The California-mountain plant, with slender virgate branchlets and narrow, rather thin leaves, appears to pass, on the one hand, into the broad-leaved form of the north, and on the other into that of the California coast-region. With so many and so closely connected forms to be disposed of, the only way seems to be to consider them climatic varieties of the same species.

The species considered in this way serves to illustrate the influence of climate upon the gradual development of different closely connected forms. Abundant humidity produces arborescent habit and large thin deciduous, nearly glabrous, leaves which, as the climate becomes drier, are thicker, more persistent on the branches, smaller and more generally protected with a pubescent covering which increases in density as the amount of humidity decreases, the size of the plant decreasing also in proportion as humidity is withdrawn from it, the essential organs of reproduction being left unchanged. Very few of our trees, with the exception of certain western conifers, which seek high elevations as their range extends southward, and therefore are not subjected to very great diversity of climate, grow over as wide a range of territory of varied climate as *Rhamnus Purshiana*. Exceptions are the Negundo and the Celtis, both of these varying in different parts of the continent as remarkably as the Pacific coast Rhamnus in foliage and in pubescence.

Rhamnus Purshiana was discovered in 1805 or 1806 in what is now Montana by the members of the Transcontinental Expedition under command of Lewis & Clark. It was first described as *Rhamnus alnifolia* by Pursh. De Candolle first noticed that it was distinct from the eastern plant and described it in the second volume of the "Prodromus," published in 1825. The California plant was detected by Eschscholtz on the shores of the Bay of San Francisco in 1816, and was described by him in the tenth volume of the Memoirs of the Academy of St. Petersburg, published in 1826, so that the two plants being considered specifically the same, De Candolle's name of *Rhamnus Purshiana*, being the older by one year, would have to be adopted for the species thus enlarged.

In 1838 Rafinesque describes in the "Sylva Telluriana" his *Persoon laurifolium*, his description being drawn from a plant which he found in Bartram's Botanic Garden, in Philadelphia. It is a tree, he says, from the Oregon Mountains, with elliptical acute subentire shining, glabrous leaves; pubescent on the lower surface when young, reniform petals, and a slightly emarginate stigma. The plant in Bartram's Garden was twenty feet high, and the "berries form fine clusters and assume three colors, being by turns green, red and black when fully ripe." This is the earliest record of the cultivation of *Rhamnus Purshiana*, for there does not seem to be much doubt that it was this plant Rafinesque had in mind. Certainly there is no other tree from the mountains of Oregon which could be made to answer to the description. If Lewis & Clark, as is possible in the case of a plant of whose medicinal value they must have learned from the Indians, had brought home seed, these might very well have produced by 1838 plants twenty feet in height.

C. S. Sargent.

New or Little Known Plants.

Viola hastata.

THERE are several species among our American Violets which are rarely seen in gardens, although they possess much charm and beauty as garden-plants. Our common northern *Viola cucullata*, *Viola pedata*, the Birds-foot Violet, the charming little yellow-flowered *Viola pubescens*, and the white-flowered *Viola Canadensis*, one of the best plants which can be grown in a rock-garden sheltered by overhanging trees, are all excellent subjects to naturalize in the garden. Equally attractive, although much less well known, is the Halbert-leaf Violet (*V. hastata*, Fig. 16), which grows very locally in northern Ohio, and is found in the forests of the Alleghany Mountains from Pennsylvania to the northern borders of Florida. It is a yellow-flowered, slender, nearly glabrous species, distinguished by its halbert-shaped stem-leaves, which in one remarkable southern form are three-lobed, or even trifoliate (var. *tripartita*). This pretty plant will doubtless thrive in cultivation under the conditions which are favorable to the growth of *Viola pubescens*, to which, botanically, it is very closely related.

Plant Notes.

Barbacenias and Vellozias.

FROM the number of enquiries recently made with reference to the cultivated species of these two genera, it would appear that they are attracting the notice of horticulturists, and as many of them, particularly the uncultivated species, are of quite exceptional interest and beauty, some notes upon them may be acceptable.

They form a section or suborder of *Amaryllidaceæ*, but in general characters they differ widely from the common garden representatives of that order. Their most characteristic features are thus described by Lindley in his "Vegetable Kingdom":

"In Brazil, southern Guiana, and also in the Mascarene Islands, there occurs a race of plants which may be compared to Conestyles, of New Holland, on a gigantic scale. Martius, who calls them Vellozias, describes them as perennial Lilies, with their trunks closely covered by the withered remains of leaves, branching by forks, and bearing at their points tufts of leaves in the manner of a Yucca or Dracœna; some of them are from two to ten feet high, with a trunk sometimes as thick as a man's body. I find the structure of their trunks most curious. It consists of a central slender subcylindrical column, which never increases in diameter after its first formation, and which has the ordinary monocotyledonous structure. Outside of the column are arranged great quantities of slender fibrous roots, which cohere firmly by their own cellular surface, and form a spurious kind of wood, which is extremely like that of some kinds of Palm-wood, only it is developed by constant additions to the very outside of the stem."

Living plants of several species at Kew exhibit this remarkable stem growth, and in the Museum there are fine specimens of large stems.

The flowers of the cultivated species are large, elegant and richly colored, but they are small and unattractive when compared with some of the Brazilian species of Vellozia, which are described by collectors as forming beautiful plants with elegant foliage and Lily-like flowers from four to six inches across, their color purple, yellow, blue or white. Gardner collected specimens of some of the finest of them in Minas Geraes, and both he and other collectors state that they are common on the mountains of Brazil.

Seeds of these plants are freely ripened when in cultivation, and they may be kept at least six months without losing their

power to germinate. This has been proved this year at Kew, where seeds of *Barbacenia squamata* have been ripened. Indeed, we have proof that seeds offer an easy means of introducing these plants, in the fact that some of what may be *V. compacta* were sent to Kew by the ex-Emperor of Brazil in 1888, and that plants have been raised from them which are now eighteen inches high.

The mountains of south Brazil being the happy hunting-grounds of the Orchid-collector, it ought not to be difficult to obtain through him seeds of the most striking of these plants. Even the stems may be sent a long voyage with safety, for at Kew and also in the Jardin des Plantes at Paris may now be seen beautiful examples of a most striking species as yet undetermined, the stems many times branched, triquetrous, and clothed at the tops with bright green plicate leaves. These have been sent from Brazil within the last three years. Mr. Sander also introduced two years ago a fine specimen, four feet high, of *Barbacenia squamata* which is now at Kew, where it flowered freely all last summer.

Fig. 16.—Viola hastata.—See page 76.

According to Bentham and Hooker there are eighteen species of Barbacenia, all of them Brazilian, and fifty species of Villozia, natives of Brazil, Africa and Madagascar. Some very fine species have lately been found in this last country.

The cultivated plants of these two genera are as follow :

BARBACENIA PURPUREA. — This was introduced accidentally, seeds of it having been concealed in a small quantity of soil adhering to some epiphytes sent to Dean Herbert from Rio Janeiro. Some of the seedlings were sent to Lord Milton, whose garden at Wentworth House was at that time famous, and they flowered in August, 1827. This species is the only one that is generally known in horticulture, and even it is rare. It has a short stem, elegant grassy-green leaves, with spiny margins and tall, single-flowered scapes. The flowers have a trigonous tube, a flat, spreading limb of six lanceolate segments, colored a rich maroon-purple. What is probably merely a large-flowered variety of this is figured in Moore's *Magazine of Botany* under the name of *B. Rogieri*, which is said to have been produced by crossing *B. purpurea* with *B. squamata*. This plant is cultivated now in continental gardens as *B. hybrida*.

B. SQUAMATA was introduced from the Organ Mountains by Veitch of Exeter in 1841. It has the foliage of *B. purpurea*, but the stem attains a length of several feet and branches. The flowers are produced singly upon thin, wiry scapes, each flower being one and a half inches across and colored bright scarlet. This is almost certain to prove a most useful garden plant. It appears to have been lost from gardens until introduced to Kew last year.

B. SCHIDIGERA was introduced from Minas Geraes into Belgium by the collector, De Jonghe, in 1849, and was figured in Lemaire's *Jardin Fleuriste*, *t.* 198. It has a short stem, leaves six inches long, clothed with silky hairs, twisted and brown when old. The scapes are erect, one-flowered, and the flower is two inches long, the limb spreading and colored rich vermilion.

B. MACRANTHA was also described and figured by Lemaire from plants obtained through De Jonghe in 1853. It resembles the last-named in foliage and habit, but differs in having scarcely any flower-scape, and in the flowers being nearly twice as large. Neither this nor the last is in cultivation in England so far as I know.

The cultural requirements of Barbacenias are simple. They prefer an airy, sunny position in a warm greenhouse, an open soil such as suits *Odontoglossum crispum*, and a moderate amount of water. They seed freely, and their seeds vegetate readily if sown on peat in a warm house.

VELLOZIA ELEGANS is the only cultivated African specimen. It was introduced from the Cape or Madagascar in 1866, since when it has been in cultivation at Kew. It forms a

tuft of short wiry stems, branching freely at the base; the leaves are bright green, lanceolate, keeled, and about six inches long, and the flowers, which are borne singly on thin scapes as long as the leaves, are not unlike those of *Milla biflora* in form and size; they are at first lilac-colored, changing to white before finally turning green; they remain upon the plant several months before withering. This is a pretty little plant for the stove or warm greenhouse. It delights in sandy soil and plenty of sunlight.

V. candida flowered at Glasnevin in 1865, seeds of it having been sent to Dr. Moore from Brazil by Gardner. It has narrow-channeled, semi-erect leaves, with fine marginal teeth, and white star-shaped flowers three inches across, borne on erect scabrous peduncles.

There are young plants at Kew which may probably turn out to be *V. compacta*, which is one of the large-stemmed kinds described by Lindley, and which has flowers about six inches across, colored rich purple. There are also young plants of a Cape species, raised from seeds, but they have not yet flowered. Evidently these plants grow very slowly, and the tree-like specimens seen in Brazil and Africa are probably of great age. Of these stems might be introduced, but, failing them, seeds ought certainly be obtained for cultivation.

Kew. *W. Watson.*

Cultural Department.

Planting and Pruning in the Orchard.

ONE sees a good deal of advice offered in regard to orchard work, which, while it may be good under the conditions given, is only of value under those conditions. When we have to buy our trees from a nursery, often at a considerable distance, we must take the trees as we get them; and it is not strange, therefore, when we have to use many precautions, not in themselves essential under better circumstances. For example, take young trees grown in a highly manured soil, dig them carelessly, perhaps with a mechanical digger, leaving the roots short, with their ends so bruised that still more needs to be cut away, and the advice given to shorten in the young wood in a corresponding degree is good. Even then, it is too often the case that no growth can be expected from such trees the first season. On the other hand, if the farmer grows his own trees, or has them from a neighboring nursery, where he can have them taken up under his own inspection, he may get them with their whole root system practically intact, and can set them into the ground again within a short space of time. If this work is properly done, and the ground about the trees liberally mulched, the growth in an ordinary year will be but little checked, and cutting back wholly uncalled for.

There is a good deal being said just now about the formation of a "Nursery Trust," and perhaps this of itself will cause many who contemplate engaging in orchard work as their main business, to think seriously of growing their own stock. If this should be so, the organization of such a trust would not be without advantage. When one considers how simple a business, comparatively, the propagation of fruit-trees is, it is remarkable to note how few fruit-growers attempt to grow their trees from the start. Possibly the chief objection is found in the time supposed to be lost. This may be a good reason for buying a few trees to start with, in order to get an early supply for family use; but if home propagation is started at the same time, the orchardist will soon discover that but little time need be lost. If he is in a great hurry, he may get his stocks, or even his root-grafts (or stocks in bud), from a nurseryman; but if he at the same time begins with the seeds, growing his own stocks and grafting or budding them, experience will demonstrate to him that the loss of time is mainly imaginary.

From the necessity of the case, being without the means to buy many trees, I began in this way in my fortieth year, and expect next spring to complete the planting of a new orchard of 1,000 Apple-trees, begun two years ago, and I am now in my sixty-fourth year. Although laboring under the disadvantage of planting in a part of the country where no really iron-clad varieties were then known, and consequently having to replace nearly all of my earlier plantings during the first ten years, my oldest orchard has long been abundantly productive, even during the past unfavorable year.

The advantage of a well-managed home nursery is, first, in the knowledge acquired in regard to the character of each variety from its youth up, and second, in acquiring skill in forming the heads of the trees, so that but little subsequent pruning, other than that of a pocket-knife, will be needed. An orchard so grown from the beginning is worth many times more than one which has required and received heavy pruning in order to form a practicable top to each tree. A third advantage is in the opportunity to select the very best trees for planting. Seedling roots, even the best, differ among themselves. The union formed between stock and cion is not equally good in all cases; and there are other reasons why there is a great choice between individual trees in the best nursery, and such a choice the grower of his own trees alone has.

But greater still is his opportunity, not only to plant properly, but to take up the trees with all their roots practically uninjured and to set them out at once, with his own hands, in holes ready dug for them. Instead of being obliged to cut back all, or nearly all, of the previous year's growth, it may be left with the assurance, if the work is all well done, that a good growth will be made the same season. The cutting back at planting, so strongly insisted upon by commercial nurserymen and by most writers on the subject, is substantially a confession of the bad condition, comparatively, in which nursery trees are apt to reach the planter. "No growth the first year" has to be accepted as almost an axiomatic statement; but it will be found to have no reality when the practice I advise is carefully followed.

In the "cold north," except with the most perfectly iron-clad sorts, even the penknife cutting back of last year's growth is followed by serious and permanent injury to the young tree. The cut surface blackens, in part, perhaps, in consequence of the aphids collecting upon it, and, I have sometimes thought, poisoning the wood by thin saccharine excretion, which affords a nidus for Fungi that subsequently attack the wood. Certain it is that on dissection these cut limbs show death, and even decay, the second and third seasons; and though a thrifty growth may follow, yet, when full-bearing age is reached, an overladen limb, breaking down, will reveal advanced decay. I find this even in such a hardy variety as the Wealthy; and rigid investigation with saw and knife traces it back directly to the shortening of the young growth at planting, so generally taught by supposed experts in the business.

Newport, Vt. *T. H. Hoskins.*

Aquatics in the Flower Garden.

DURING the past few years a great change has been effected in our parks and private gardens in the style of "bedding out" toward something more natural than the ribbon border or set patterns and pictures. It has also been found that bold masses of foliage, combined with flowering plants, have a much more pleasing effect than when flowers alone are used. The Public Garden in Boston was much admired last summer, with beds of foliage plants representing the badges of the different army corps that visited that city, but there were no beds so effective or graceful as those by the side of the centre walk over the bridge, which were filled with sub-tropical foliage plants. These beds doubtless cost less labor and required less attention than the smallest of the badge beds.

Very effective groups can be made by the liberal use of aquatics, Palms, Cannas and other large-leaved and strong-growing plants. Musas are very effective in sheltered spots, where the leaves are not torn by the winds. Among aquatics the *Nelumbium speciosum*, or, as it is more generally known, Egyptian Lotus, takes the front rank. This is the largest of Water Lilies, with the exception of *Victoria regia*, but it has the advantage over the latter in being hardy, and can be grown in almost any garden. It is a strong grower and a rambler, and requires to be kept under control in the flower-garden or in the Lily-pond with other aquatics, as the roots spread so fast that it would soon crowd out all others. Almost any kind of tank will answer to grow it in, provided there is a depth of about three feet of water and brick walls or divisions to keep the plants within limit. About a foot of soil, composed of old sods and rotten cow manure, will be needed, and the planting should be done about the 1st of May or as soon as growth commences. The tank should be filled gradually with water as the plants grow, and on the approach of winter, if the water is deep enough to save the roots from freezing, it may be left in the tank; if not, the water should be drawn off, and the plants covered with leaves, salt hay, or litter to protect them. This makes a grand background in a tank where hardy and tropical Nymphæas are grown, or a stately object by itself, or in large tanks and lakes in parks. The native and hardy kinds of Nymphæa are all worthy of a place in the aquatic garden. The pink Cape Cod Lily is especially fine, and the white European Water Lily (*N. alba candidissima*) is the largest hardy white variety, a most profuse bloomer and a chaste and exquisite flower. Too much cannot be said for the new yellow variety, *N. Marliacea*, which is perfectly hardy and of easy culture. The habit of the plant is like *N. alba candidissima*.

It is a robust grower, flowering freely the entire season, with a beautiful flower, with broad petals of a light yellow color, and bright orange stamens. It is a great acquisition. These require no protection in winter, but to save the masonry-work of a tank leaves or evergreen branches or other litter may be used to cover the edges. All tropical

Fig. 17 —Forsythia suspensa trained on a Porch at Wellesley.—See page 74.

Nymphæas can be grown in the same tanks, either planted out or grown in tubs, plunged in the tank, but these cannot be safely planted till June, and must be taken out in the fall and protected in a greenhouse.

The Egyptian Papyrus is another very interesting plant, either to grow in water or to plant in a border grouped in a mass. In either case it requires a good rich soil and moisture. It forms a beautiful contrast to the deep green and metallic shades of Cannas. This plant and the Egyptian Lotus have a very remote antiquity, and figure constantly as sacred plants in early Egyptian art. Both were very useful aside from their ceremonial and religious uses, the Papyrus furnishing the material for paper and ropes, of which samples are found in the Egyptian tombs. The Lotus-seeds were eaten and the roots cooked as we cook potatoes. The Japanese and Chinese to-day plant the Lotus in the fields after the rice has been harvested and use the roots as food. There is a tradition that the American Indians used both the seeds and

roots of the American Yellow Lotus, *Nelumbium luteum*, for food.

Associated with Aquatics and in the rear of the tank, specimen Palms, Rubber-plants, Cannas, Ricinus, Caladiums, Phormiums, with Arundos, Bamboos, Eulalias and other hardy ornamental grasses, in single plants or clumps, are most picturesque. Many other plants will suggest themselves to lovers of flowers for use near the water edge and in suitable places. Spiræas, Iris, Acorus, Sagittarias, Cyperus and others may be planted beside Aquatics that require shallow water, such as Limnocharis, Pontederia, Pestia, etc. In half-shady places some of the fine foliaged Begonias and Caladiums planted along with hardy Ferns are very beautiful. If water can be combined with rock work it will give a much more pleasing effect in sub-tropical gardening. Foliage plants can be used in a variety of ways, and some of the commonest plants can be made most effective and to harmonize with plants of greater rarity if judiciously introduced.

Dongan Hills, S. I. *W. Tricker.*

Perennial Gaillardias.

WITHIN the past few years Gaillardias as hardy plants have become well known among those who cultivate such plants extensively, but the decorative value of the perennial Gaillardias is not so generally appreciated as it should be. The ease with which they may be raised, and the short time required to secure an abundance of flowers, are strong points in their favor, and the various uses to which the flowers are adapted when cut, owing to their durability, is another reason why they should be widely grown. The perennial Gaillardias are the offspring of *G. aristata*, a North American species which is found over a wide area in the western states, and although in cultivation for a number of years, it is only recently that it has been taken in hand for development, and the results are so far most satisfactory. It is not the best way, in commencing to grow Gaillardias, to get expensive named kinds. Our first attempt at their culture was to import a dozen named varieties; the greater portion arrived dead, and those which survived were not to be compared with others obtained later from seed. To those who have not hitherto grown these plants we would say procure at once, if heat is at disposal, a packet of *Gaillardia grandiflora* and sow thinly in boxes, and, as soon as the young plants are large enough to handle, pot them off singly in small pots, and, when weather permits, plant them out where they are to stay, and they will flower the same season. There is a great advantage in potting the young seedlings, as their roots are very delicate and do not bear the disturbance which is unavoidable in transplanting when the young seedlings are placed in flats. Should any variety of special merit in the opinion of the cultivator occur, the particular one may easily be perpetuated by means of root-cuttings. To do this the plant must be carefully lifted, the roots preserved and placed in sand in the propagating bench, and, if not covered too deep and kept moist, they will speedily commence to grow and make plants that may be treated as young seedlings. We have always found all the perennial kinds of Gaillardia, including the variety known as *G. Templeana*, to come readily from seed, though the reverse has been asserted. It is just possible that seed of perennial varieties may be offered under other names than *G. grandiflora*. This need not cause any hesitation, for the hardy kinds, under whatever name, are all derived from *G. aristata*, which is, so far as I know, the only hardy perennial species in cultivation, though several others are enumerated by Gray, in the "Synoptical Flora."

South Lancaster, Mass. *E. O. Orpet.*

Notes from the Harvard Botanic Garden.

ÆSCHYNANTHUS SPLENDIDUS.—The Æschynanthuses are tropical epiphytes which require stove treatment. The stems usually trail or hang down, and they are furnished with opposite leaves. Their trailing stems render them very appropriate plants for cultivation in hanging baskets. The plant here mentioned, however, has cylindrical stems of somewhat erect, scandent growth, and elliptic-lanceolate, pale green leaves, about three inches in length, occasionally arranged in whorls of three. It is a hybrid of garden origin. The flowers are borne in dense terminal clusters. The corolla consists of a curved tube three inches long, widening toward the five-lobed mouth, which is three-fourths of an inch across, the color orange-yellow at the base and scarlet at the top, with brownish marks on the three lower lobes. The creamy white pistil, with large circular stigma, protrudes an inch beyond the corolla and adds to the pleasing character of the flower. This plant usually blooms twice a year, once early in spring and again late in summer. Every young branch will produce a cluster of the showy flowers, which retain their full-blown beauty for several weeks. The plant should be grown in a pot and trained to a rafter or trellis; it is most effective in this way. Fibrous peat, with the addition of a little rough charcoal, is the most satisfactory material for potting. Cuttings planted in sandy soil, and kept moist in a close propagating box, will take root quickly.

JASMINUM SAMBAC.—The Arabian Jasmine, as this species is commonly called, is an old occupant of greenhouses. It is a stove plant of free climbing habit, the opposite, ovate-acuminate, cordate, rich green leaves, with very short petioles, measuring between two and three inches in length. The leaves are so closely arranged upon the stem that they often overlap. The pure white, salver-formed flowers are deliciously fragrant, and they are borne in clusters of about five on the little branches, which proceed from the axil of almost every leaf on vigorous young growth. The tube is an inch in length; the limb an inch and three-quarters across, divided into about eight oblong, reflexed segments. The flowers are most abundant during the latter part of summer, but old-established plants are almost continuously in bloom. This plant is seen at its best when trained somewhat loosely to a pillar or rafter, and, although more at home in a prepared border, it succeeds very well under pot-culture. It is propagated by inserting cuttings, prepared from the half-ripened growth, in sandy soil. There are two other quite distinct varieties of this Jasmine. One of these has semi-double or double flowers; it is of decidedly bushy habit, and therefore better adapted for pot-culture than the species. The name of the remaining variety, *J. Sambac trifoliatum*, affords all necessary description of the plant.

JATROPHA PANDURÆFOLIA.—A miscellaneous collection of stove plants is much enlivened during autumn and winter by the scarlet flowers of this free-growing shrub. The stem is woody, and, unless the tip is pinched out occasionally during active growth, of a somewhat rambling character; indeed, there is a tendency toward lankiness where this course is not pursued. The alternate leaves are green above and much paler on the under side. The specific name, meaning fiddle-leaved, indicates an outline which is common to them, but far from constant. The blade of the leaf is from three to four inches in length and toothed at the base, where it sometimes deviates from the regular form in being lobed or angular. The bright flowers, with five obovate petals, are rather more than an inch across, and freely borne in terminal cymes on a peduncle four inches long. The plant was introduced from Cuba, about 1800, by Mr. J. Fraser, at whose nursery in the vicinity of London it flowered shortly afterward for the first time in England. Cuttings of the young branches root freely in sandy soil with the aid of moderate bottom heat. When rooted the plants should be potted in a mixture of loam, peat, old cow manure and sand, in equal parts, and placed in a sunny part of a house in which a stove temperature is maintained, after having been started into growth in a more shady position. *J. acuminata* is a synonym frequently met with.

Cambridge, Mass. *M. Barker.*

Freesia xanthospila.—A plant of this favorite flower now in bloom does not differ in habit from others of the family. The scapes are furnished with five or six flowers produced in succession. The individual flowers are pure white, with a small blotch of yellow on one of the segments. The segments are narrower than in *F. refracta*, spike-shaped, narrowing abruptly into a long and rather slender tube. The flowers are rather more graceful and elegant than those of the more common species. *F. refracta alba* is now a very popular flower and widely cultivated, as it is so easily managed, but it seems to be inconstant in its markings; some forms are entirely white, and others vary from a slight blotch of orange at the base of tube to a considerable marking on the segments. *F. Leichtlini*, which also varies from this variety in its form, is usually suffused with orange-yellow in all its parts. *F. Fosteri* seems nearly, if not quite, identical with this variety, but is said to bloom later.

Elizabeth, N. J. *G.*

Begonia Winter Gem is one of several useful winter-flowering hybrids raised by Messrs. Veitch by crossing *B. Socotrana* with others. It was exhibited in beautiful condition by the raisers at a recent meeting of the Royal Horticultural Society, and proved its superiority over almost all other Begonias by the way it has weathered the fogs and darkness of this winter. The plant is scarcely a foot high, and it has rich, glossy green leaves and graceful, almost erect, scapes of regular bright crimson flowers. A peculiar character of *B. Socotrana* and all hybrids from it is that of retaining their flow-

ers until they wither. I have seen Begonia Winter Gem and its brother hybrid, Begonia John Heal, bear their flowers fully six weeks before they fade.

London. *A. S.*

Correspondence.

Winter Notes from North Carolina.

To the Editor of Garden and Forest:

Sir.—The Yellow Jasmine (*Jasminum fruticans*), a low shrub from southern Europe, has been constantly in flower for two weeks or more, notwithstanding the coldest night of the winter came within this time. *Spiræa prunifolia* also showed a few flowers in January. Shepherd's Purse (*Capsella Bursa-Pastoris*) and the little Dead Nettle (*Lamium amplexicaule*), so common in some gardens of southern Massachusetts, are also in bloom. I observed one plant of the Trailing Arbutus (*Epigæa repens*) and one of *Asarum Virginicum* in full flower; but the former was well budded, and our New England plants would have bloomed with half as much mild weather. Both of the Hepaticas grow here (*Anemone acutiloba* and *A. Hepatica*), but with handsomer mottled and colored leaves than those farther north, owing, no doubt, to their being so much exposed to the sun in winter. They do not bloom here, however, in the first warm sunny days, as plants in New England do, but seem to wait for the proper time, whatever the weather may be. And this seems to be the habit of most native plants here. The same number of warm days in New England, with no frost in the ground, would bring out almost all of our first spring flowers.

Both of the species of Ginger Root common to this locality (*Asarum Virginicum* and *A. arifolium*) are scattered through the woods of the lower elevations. Nowhere abundant as *A. Canadense* often is in New England, but almost everywhere, in moist, well drained, shaded soil, a sprinkling of them will be found, with their shiny, mottled green leaves as handsome as at any season. Several troublesome weeds here are sometimes cultivated north. On dry, cultivated soil, in places, the Passion Flower (*Passiflora incarnata*) is as common as the Canada Thistle is in parts of northern New England. The Cypress Vine (*Quamoclit coccinea*), Small Morning Glory (*Ipomea Nil*) and *I. lacunosa* are troublesome weeds in many cultivated fields. On the mountain-sides the Wild Potato Vine, or Man-of-the-Earth (*I. pandurata*), is abundant.

One species of the Greenbrier (*Smilax glauca*) is very abundant here, its leaves and fruit often persistent through the winter. The leaf is ovate, and sometimes cordate in outline, and turns to a reddish purple. These, with its black grape-like fruit, which it sometimes bears in great abundance, make the plant an interesting one as seen growing along the margins of thickets, but one who tries to penetrate these thickets, and finds himself arrested by its stout prickles, soon loses his admiration for its beauty. There are places, no doubt, where it might be used to good advantage, but the possibility of its spreading beyond its intended bounds might overbalance its merits.

The American Holly (*Ilex opaca*) shows the handsomest foliage of any native tree I have seen here. It is not abundant, but scattered specimens are found along the bottoms of ravines in which brooks flow, and also occasionally in the open country along the margins of streams. I have seen only two or three specimens in fruit. The severe frost of last March seems to have prevented its fruiting.

Lynn, N. C. *F. H. Horsford.*

Winter Flowers in California.

To the Editor of Garden and Forest:

Sir.—The earliest herald of the new year here is the Chinese Narcissus. Mongolian washermen are quite liberal with their national flower, and many specimens, after having blossomed once in water, have been turned out-of-doors, and blossom annually in the open border. They have been in flower now for several weeks. To-day one of my Trumpet Major Narcissus is in bloom. The Violets commenced to blossom when the cool weather set in. They have kept flowering ever since, and now are quite full. The Pansies, too, and a bed of Verbenas, in a warm situation, have bloomed in a desultory sort of a way all winter, and now present quite a bright appearance. A plant which seems strangely out of season is a Polyanthus, which threw out stray flowers late in the fall and is still in blossom. The Roses, too, feel the influence of the warm spell, and their buds are swelling. There was a Rose carnival at Pasadena, in the southern part of the state, about the New Year, but we wait till May for our Roses.

Ukiah, Cal. *Carl Purdy.*

Recent Publications.

Die Krankheiten und Beschädigungen unserer landwirtschaftlichen Kulturpflanzen. Von Dr. Oskar Kirchner. Stuttgart, 1890. 8vo, pp. 637.

The number of treatises on plant diseases which have appeared in Germany in recent years is so large that one could hardly expect any novelty in the method of treating the subject. In this well-printed and neatly bound volume the author has, however, arranged his material on a plan which differs considerably from that of previous works. In the first part, under the heading of Grains, Fodder-plants, Fruit-trees, etc., are arranged the principal plants known in the agriculture and horticulture of Germany, and under each species is given a popular account of the more frequent morbid appearances, as spots, distortions, tumors, etc., with the name of the fungus or insect which causes them. The plan might be called a dichotomous key to morbid appearances, and, except in its more detailed character, resembles the synoptical keys common in botanical manuals. A key to morbid appearances is, as far as we know, quite novel, certainly on such a large scale as the present. The second part of the book is a condensed account of the principal genera of injurious fungi, with a few genera of parasitic phænogams, and the genera of injurious worms, insects and snails. Under each genus is a description of the species mentioned in the first part of the book, cross references being made by bracketed numbers.

The plan is certainly simple, and, if practicable, the work must be of good service to those who have little previous knowledge of fungi and insects. Whether really practicable or not experience alone can decide. But fungi are so numerous and complicated that it may perhaps be doubted whether the unlearned reader could be supposed to follow the key with any great degree of confidence. If it should happen, as might easily be the case, that he had before him something not in the key, he would go hopelessly astray. For those who know something of fungi, the present key is cumbersome and less accurate than other methods found in previous works. Since there are no figures to aid the beginner, and he must depend on the text alone, we shall look with interest to know whether in practice the plan works well, for, if it proves to be a good one, it is likely to be adopted by future writers.

Exhibitions.

Orchids at Short Hills, New Jersey.

All last week the United States Nurseries were receiving visitors at the invitation of the proprietors, Messrs. Pitcher & Manda. Many persons from distant cities were there, and every one was repaid for the journey by the abundant display of Orchids in flower. In the chain of houses, 425 feet long, the Cypripediums were most numerous, the plants in flower numbering a scant dozen less than 700, while the Cattleyas flowering in brighter groups mustered 567 strong. These numbers give some idea of the extent of the exhibition, while the neatness of the whole, with the skillful arrangement and perfect health of the plants, made it unusually attractive in quality throughout.

In so extensive a collection, it is, of course, impossible to name all the plants of special merit. The 126 varieties of Cypripedium in flower, for instance, would naturally include most of the standard sorts which flower at this time. Perhaps the searcher for novelties would be most interested in the varieties Electra, Pitcherianum and Galatea, all good in their different types, and all flowering now for the first time in this country. Some hybrids between *C. venustum* and *C. Boxallii* were interesting. They were raised in this establishment, and the extent to which the production of new seedlings is carried on is appreciated by the visitor when he is introduced into a house where 1,700 seedlings are growing. Some of the Cypripediums are coming into bloom now about two years after the seed was sown. One of the hybrid Dendrobiums raised here is now in flower. It is from *D. Rukeri*, fertilized by *D. nobile*.

Other noteworthy Dendrobiums in bloom were the rare white form of *D. densiflorum*, large specimens of *D. thyrsiflorum* and *D. Wardianum grandiflorum*. There were fine varieties of *D. Ainsworthii*, and the variety *Wallichianum* of *D. nobile*.

The pick of the Angræcums was a large specimen of *A. sesquipedale*, with seven of its great white star-like flowers open at once. A good plant of the white variety of *Cælogyne cristata*, and some fine varieties of *C. flaccida* were the attrac-

tions offered by this genus; and among Cymbidiums there were good specimens of *C. giganteum*, *C. Lowianum* and its dark purple variety. The choice Cattleyas were varieties of *C. Percivalliana*, one specimen showing twenty-seven flowers, and some exquisite forms of *C. speciosissima*.

About the best of the Masdevallias in bloom was the large-flowered variety of *M. Veitchiana*, and the best of the Lycastes were some plants of *L. plana* and the ever-pleasing white variety of *L. Skinneri*. There were some fifty fine Odontoglossums in flower, one of them a grand specimen of *O. Pescatorei*, and some specially elegant varieties of *O. crispum*. The best Oncidium was a really splendid plant of *O. splendidum*, and of the Phalænopses a specimen of *P. Schillerianum*, with a spike thirty inches long and bearing thirty-four flowers, took the lead, followed by good specimens of *P. Stuartiana* and *P. amabilis Dayana*. There were many other things besides Orchids to see, but these plants should not be left without mention, of a magnificent specimen of *Vanda gigantea*, some fine examples of *V. tricolor* and Rollins' variety of this species.

Outside of the Orchid houses the visitors found the greatest delight in the long structure, where they walked under an almost interminable line of arching fronds of Tree-Ferns and the spreading leaves of great Palms, with Musas, Dracænas, Encephalartos and other plants grown for graceful effects of foliage. The houses branching off from this were each devoted to some special plants—one to Anthuriums, another to *Pandanus Veitchii* and Dracænas, a third to Camellias and Azaleas, a fourth to Cocos and Kentias, and so on. Perhaps the most interesting of these contained a broad central bench, devoted throughout its entire length of a hundred feet to Araucarias. The middle row of these was of a uniform height of some four feet, the outer rows growing shorter toward either side. The perfect evenness of the plants, with the delicate texture and color of their foliage, made a long, regular mound of soft green which was strangely beautiful.

New York. *S.*

Meetings of Societies.

Iowa State Horticultural Society.

THE twenty-fifth annual meeting of this Society, at its rooms in the state capitol at Des Moines, was largely attended, and although a series of severe winters has given a check to fruit-growing in the state, and many orchards have been killed, yet two mild winters have once more given good fruits and renewed hope. The apple industry in parts of southern Iowa is now fairly prosperous, and there are many large commercial orchards there. In northern Iowa, aside from some of the new Russian varieties, only the Oldenburg, Tetofsky, Wealthy and Whitney Number 20 can be recommended for general planting. The sum of $2,000 was appropriated by the Society for horticultural experimentation next year, and it was decided to continue on an enlarged scale the work of last year in crossing and hybridizing, with the hope of producing varieties of fruits which are better adapted to the various climates of the state. The following officers were elected: President, Eugene Secor; Secretary and Director of Experiment Stations, G. B. Brackett; and Treasurer, Henry Strohm.

PLUMS AND CHERRIES FOR THE FARMER'S ORCHARD.

Mr. H. A. Terry, of Crescent City, Iowa, delivered an address on this subject, from which we make the following extract:

"It is a well-known fact that the Sweet Cherry and the European Plum have not been grown successfully on the fine loam soils of the west, but on the clay soils on the eastern side of the state they are grown quite successfully. I have been experimenting for several years with many varieties of Plums, but my main successes have been with the American varieties. I have much faith in some of the Russian and Japan varieties, however, as they seem much hardier in tree and fruit-bud than any of the older European varieties. The following list of American Plums I can recommend for general planting in the farmer's orchard, and the names are arranged in the order of their ripening: Milton, a new variety, and the earliest of the Chickasaw class, has large, bright red fruit. The tree is a fine upright grower, very hardy and productive. Wild Goose is the well-known variety next in earliness, and very good for culinary use. Forest Garden follows close after Wild Goose, and is a fine dessert or cooking fruit. The tree is a strong grower, perfectly hardy and wonderfully productive. The fruit is a light mottled red, with a very thin skin, and is superior for canning. De Soto is a native of Wisconsin, with large yellow fruit, which becomes red when over-ripe. It is excellent in quality and unexcelled for canning. Rollingstone originated in Minnesota. The tree is hardy and productive of medium-sized free-stone fruit of excellent quality. The Wolf is a strong, rather upright grower, very hardy and productive of large, rather dark red, firm, free-stone fruit of good quality. Hawkeye, another new variety, has done well wherever it has been tried. The tree is a vigorous grower, upright while young, but becoming more spreading with age, very hardy and productive. The fruit is of largest size and finest quality; it is light red, mottled with darker red; the whole fruit becomes dark red when fully ripe. The firmness and large size of the fruit make it very desirable for canning. Forest Rose is a late variety, with fruit of good size and good quality. The color is dark red, like that of the old Miner, of which it is a seedling. It bears abundantly, and the fruit keeps well. Maquoketa is another seedling of Miner, with fruit a trifle larger than its parent, and is one of the best for culinary purposes. If the farmer wishes to prolong the plum season he should plant a few trees of the Moseman, probably the latest variety in cultivation. The fruit is only medium in size, of a bright shining scarlet, and it ripens in early October, but will keep fresh until November. The tree is vigorous and most productive. The fruit is not of the first quality. Its chief value consists in the lateness of its season and its great productiveness.

"The list of really valuable Cherries is not a long one, but two or three of the old sorts would pay to plant, even if one has to replant, say every ten years. Early Richmond, Dyehouse and English Morello are all good varieties, but are not long-lived trees, and will require to be renewed every ten or twelve years. The Russian varieties that have been sent from the State Agricultural College seem to be hardier and more enduring for our severe climate. Among the most promising varieties so far in our state is the Wragg, introduced by Mr. John Wragg, of Dallas County. The fruit is a little larger than English Morello and of fine quality. Another Russian variety is a hardy and handsome tree, with fruit of finest quality, which ripens eight to fifteen days earlier than Early Richmond. The cherries are large, light red, and they hang on stems two to three inches long in a convenient way for picking. If it has a name I do not know it."

CROSSING AND HYBRIDIZING FOR FRUIT.

An address on this subject was delivered by Mr. N. E. Hanson, who did much practical work in this direction under the direction of the Society last year. He said:

"Much excellent work has been done in improving flowers, garden vegetables, grapes and some of the small fruits by hybridizing and cross-breeding, but comparatively little work has been done with the orchard fruits, because results are not so quickly reached, and we have been satisfied with chance seedlings and allowed insects and the wind to do most of the work for us. But the peculiar climate of the north-west requires especial care in originating new varieties better adapted to this vast region. The indiscriminate sowing of seeds is an expensive lottery. Breeders of animals select the parents, why should not breeders of plants do the same? Crossing and hybridizing plants is a method of abridging the process of evolution by introducing new elements of variation. The primitive types peculiar to each region should be used, if possible, for one side of the cross to impart hardiness, because they have become fully adapted to the environment by centuries of selection. The cultivated types should be used to impart size, beauty and quality of fruit.

"In conducting a series of experiments in crossing fruits for this Society last year I adopted the following general method: About twenty-four hours before the flower opened the stamens were removed with a pair of small forceps or pincers, such as are used in botanical laboratory work. In practice, only the anthers are removed, leaving most of the filaments. Generally, only two flowers in each cluster of Apple-blossoms were operated upon; the others were removed. Blossoms growing on a strong spur were preferred to those near or at the end of a limb. Most, or all, of the petals were removed to give easier access to the stamens. A one-pound thin manilla paper sack, with bottom squared so it could stand on a level surface, was then used to cover the blossoms and protect them from insects and foreign pollen. The next day the sack was removed, pollen applied to the stigmas with a camel's-hair brush, and the sack replaced. This time it

should be fastened with fine wire, such as is used for nursery-tree labels, because pins fail to hold the sacks satisfactorily in heavy storms. In about two or three weeks the paper sack should be removed and a sack of mosquito netting substituted. The paper sacks will withstand the ordinary wind and rain storms of an entire summer and fall, but the fruit does not hold on as well as when mosquito-netting sacks are used, soon after the fruit has set, to give access to sunshine and air.

"In crossing Grapes, from fifteen to thirty flowers were left in each cluster. I found that pollenizing could be performed to good advantage by taking clusters of bloom just opened and fastening them with string and fine wire in close proximity to the emasculated clusters. This was much easier than gathering the pollen and applying it with a camel's-hair brush. Paper sacks were used until the grapes were well set, then mosquito netting.

"The principal work was with the native Crab (*Pyrus coronaria*). The two representatives of this species used were a large-fruited variety growing on the grounds of Mr. B. A. Mathews, at Knoxville, Iowa, and the Soulard Crab. Pollen was applied of the following fourteen varieties: William's Favorite, Jonathan, Ben Davis, Pound Sweet, White Pippin, Willow Twig, Roman Stem, Summer Pearmain, Grimes' Golden, Red Stripe, Haas, Mother, Munson's Sweet, American Beauty or Sheriff. Sixty-eight fruits were obtained, containing 235 seeds. The hope is that we can combine the hardiness of the wild Crab with the size, quality and color of the cultivated Apple. If this be not accomplished by the first crosses the work is to be continued, using these as a foundation.

"The work with the Soulard was done near Des Moines, and its pollen was applied to the Red Stripe, Summer Pearmain, Ben Davis, Jonathan, Early Joe, Haas, Plum's Cider, Lowell. One hundred and forty-one fruits, containing 590 seeds, were obtained.

"The general theory followed in this work is that hardiness is imparted by the seed-bearing parent; quality and size by the pollen-bearing parent. But, to test the theory, Rawles' Janet was pollenized with Mr. Mathews' Crab, and twenty-nine apples, containing 111 seeds, were obtained. With the Raspberries the chief aim was to combine the earliness of Tyler and Marlboro with the size and quality of Shaffer's Colossal and Antwerp, and to improve the color and shipping qualities of Shaffer's. With the Blackberries the aim was to increase the hardiness and improve the fruit and habit of growth. The wild Blackberry was crossed with Snyder and Stone's Hardy, and the cultivated Blackberry with Lucretia and Windom Dewberries. The purpose is to obtain a variety with fruit as large as the Lucretia Dewberry or Erie Blackberry, and with a half-reclining habit, so as to keep the berries out of the dirt, and yet make winter protection easy where that is necessary; also to combine the hardiness of Snyder with the quality of Taylor's Prolific.

"The Blackberry and Raspberry were hybridized, and berries of both were obtained. These two species have been united before this by Saunders, Carman and others, but, so far as I know, no valuable variety has been obtained. The union appears to be too violent. But the plants produced have not all fruited, and, perhaps, success may yet be attained. Probably the best results will be from seedlings of these hybrid fruits; that is, by partial reversion the plant will be largely of one species, but retaining some desirable characteristic of the other species, thus giving it a special value.

"With Grapes the plan was to combine the earliness of Worden, Cottage, Champion and Moore's Early with the fine quality of Empire State, Salem, Agawam and Vergennes. Worden was the chief variety used as the pistillate parent, because it combines, in a pre-eminent degree, hardiness, earliness and productiveness."

STONE FRUITS AND THEIR PROPAGATION.

Professor J. L. Budd, in speaking on this subject, said that none of the varieties of Cherries first introduced into Iowa from south-west Europe have proved really satisfactory except in a few favorable locations. Some of the varieties introduced by the Iowa Agricultural College from north-east Germany and Russia promise well in parts of Iowa and the north-west, where the older varieties have failed to live. As for propagation of the Cherry, root-grafting on Mazzard is better here than budding on Mahaleb. Promising hardy stocks are *Prunus Pennsylvanica*, *Prunus pumila* and east European forms of the Morello. European experience favors growing all the stone fruits on their own roots, especially from root-cuttings. Successful experiments in growing stone fruits from short root-cuttings have recently been carried on at the Iowa Agricultural College. The Myrobalan, Black Damson and St. Julien have proved failures as budding stocks for the Plum in the west, because they are not hardy and are liable to root-kill in the nursery. Native Plum stocks of the type of De Soto, Wolf, Wyant, Hawkeye, etc., are the best stocks obtainable for western use for the native and foreign varieties.

Sun-scald and gumming of the stem can be avoided in a large measure by growing the trees in bush form with very low stems, those not more than a foot high being preferable. Trees on tender stocks should be set from four to six inches deeper than they stood in the nursery, to protect the roots and to encourage the emission of roots from the scion. One-year trees of the stone fruits are best for planting in orchard. Regular bearing is promoted by mixed planting of several varieties to insure better pollenization of blossoms.

FORESTRY FOR THE NORTH-WEST.

The following extracts are from the address of Mr. C. F. Gardner, of Osage, Iowa:

"In a prairie region like ours it is useless to plant trees until the sod has been turned and completely rotted and the soil mellowed. On an open prairie the first requisite is protection against winds. The ground for shelter-belts should be prepared first, and rapid-growing evergreens planted. My plan is to plow a strip not less than a rod wide, enclosing the area to be planted in forest. I go over this strip with a pulverizer until the soil is in fit condition to plant Onion seeds, and then plow a deep furrow, perfectly straight, on the line of the proposed hedge-row. In this furrow I set the trees, digging deeper with a spade when necessary, so that the trees will stand a little deeper than they grew in the nursery. Trees about eighteen inches high that have been transplanted should be chosen.

"I would recommend the following selection of shelter-trees in the order of their merit: White Pine, Norway Spruce, White Spruce, Scotch Pine, Red Cedar and Arbor Vitæ. Plant White Pine or Scotch Pine not more than two feet apart in the row, the other varieties not more than eighteen inches. This gives a chance, in thinning, to leave the Pine at eight feet apart and the others six feet. The thinning must be done before the plants begin to crowd; either transplant them or cut them out.

"After planting the ground should be kept absolutely free from grass and weeds; but it should be cultivated very shallow, never more than two inches deep, and less than that if possible. Go over this belt with a hoe as many times as necessary during the season.

"After the wind-break is started prepare the enclosed area for the planting of forest-trees. Free the surface from all clods, corn-stalks and rubbish. Mark off, in rows four feet apart, rows running east and west. Plant no tree within twenty-four feet of the wind-break already planted. This space should be planted with Corn, Potatoes or Beans. By planting in this way the wind-break or the forest-trees will never be broken down by drifting snow. In winters where the fall of snow is heavy, accompanied with high winds, it is not unusual for the snow to pile up from twelve to fifteen feet deep on the side of the wind-break opposite the direction from which the wind comes. Such volumes of snow are extremely liable to crush everything beneath them, as we have found to our cost.

"The Black Walnut, Butternut and Ash should be interspersed with the other varieties, as their foliage is not dense enough to properly shade the ground during the earlier stages of their growth. Always plant two or three times as many seeds as the number of seedlings you desire, for there is always a loss from mice, birds, accidents, etc. The trees should stand, at the end of the first year, not more than six or twelve inches apart. The end to be attained at first is to have the ground completely shaded as soon as possible. When this is secured, at all stages of growth thereafter, the thinning process should be so conducted as to keep it covered. At the end of the second year the plants ought to be thinned to two feet in the row."

Upon the same subject Mr. M. E. Hinckley said that there was little waste land in north-western Iowa, and while each acre in grass or grain yields immediate income people will not plant timber extensively, and yet, except in the newer sections, it is rare to see a farm without some trees. One to five, and sometimes ten, and rarely twenty, acres are found in groves. These groves are composed almost entirely of native trees, with some White Willow and Catalpa. Trees on low land are noticeably most vigorous. The Black Walnut bears when ten years old, and the White Ash at fifteen years gives a stick fit for a wagon tongue. Two acres of Maple and Willow furnish a family with fuel for a year, renewing itself as needed. The Catalpa comes short of expectation, and its introduction in this

region was probably a calamity, for if the money and labor expended upon this tree had been directed to other species we should have had something more valuable.

The errors of the past have been a neglect of proper cultivation and thinning, either of which is ruinous. The obstacles to interest in forestry are: (1) Remote profits; few people are making investments for their children when there is no certainty that real estate will remain in the family. Indeed, when the proverbial restlessness of the American citizen is considered, the probabilities are the other way. (2) The tenant system of land cultivation, which is on the increase. (3) Recent losses by drought have discouraged planters. Thorough cultivation, or if this is not possible, a heavy mulch of straw as a substitute, will alone secure success.

Mr. John Wragg said that for Iowa farmers a shelter belt could be most rapidly and cheaply grown by planting one row of Norway Spruce and one of Scotch Pine. One of these makes a rapid upright growth, while density is secured by the other. A more beautiful belt is made by planting two rows of White Pine and one row of White Spruce, the latter on the leeward side. Care should be taken, however, that the Black Spruce, an altogether inferior tree, is not substituted for the White Spruce. Red Cedar yields the quickest returns for posts, and the Larch is the best for the many uses which farmers have for small straight timber.

The most valuable Grapes for the west, according to Hon. Silas Wilson, are seedlings of Concord, and, named in the order of their value, these are Worden, Moore's Early, Lady, Pocklington, Cottage, Martha, Hayes, Woodruff's Rud, Moore's Diamond, with Esther, Colrain, Rockwood and Eaton as promising seedlings. Among the promising seedlings recommended by Mr. T. V. Munson, of Texas, are Brilliant, George W. Campbell, Romel and Hermann Jaeger. Of sixty varieties fruited last year, Mr. Wilson names for his region the following as the best six: White, Moore's Diamond, Pocklington and Lady; black, Worden, Moore's Early and Cottage.

Notes.

Of the varieties of Beans tried for forcing at the Experiment Station at Ithaca, New York, Sion House was found superior to any of the other varieties tried in compact and rapid growth, earliness, productiveness, and long, straight, symmetrical pods.

Two years ago some tests were made at the Cornell Experiment Station to ascertain whether deep-set Cabbage-plants were superior in any way to those set at their natural depth. No appreciable difference was observed. This year two hundred plants of the Early Wakefield Cabbage were set in six parallel rows, every other row containing plants set at the same depth as they stood in the seed-bed, while the alternate ones contained plants set with the first leaves even with the surface. In a heavy clay soil without fertilizers the shallow-set plants gave an average of eighty-five plants to the hundred which produced solid heads, while the deep-set plants gave only seventy-seven solid heads to the hundred. The heads of the former also weighed twelve per cent. more on an average than the others.

The disease known as the yellows is decreasing in Michigan, and the planting of Peach orchards is increasing. In Maryland the disease is said to be rapidly on the increase. This indicates that the Michigan law, which seems to have been vigorously enforced, is having a good effect, and tends toward the eradication of a malady which so far has proved incurable. It has been held by many people of southern New Jersey, as well as of the Chesapeake peninsula, that the yellows could be cured or, at least, held in check by the use of proper fertilizers, but the experiments of Dr. E. F. Smith, the special agent of the Government, who has made more than a hundred tests and tried all the remedies recommended, seem to make it clear that no treatment of this kind can be trusted either to cure or prevent the disease. It appears, therefore, that it is only by a rigid law, which is enforced by a strong public sentiment, that the Peach industry can be saved from ruin.

One of the best collections of greenhouse and other plants in the neighborhood of New York is in the garden of Mr. William Brown, of Flatbush, Long Island. It is always accessible to visitors, but on special occasions it is thrown open to the public, and an admission fee is charged, the proceeds being devoted to some charitable object. No expense is spared at such times to give a gala appearance to the place, and preparations for an exhibition in April are now being made. The beneficiary in this case is to be the Home for Destitute Children, which will undoubtedly receive a handsome sum. At the grand Chrysanthemum exhibition, held last autumn at the same place, nearly $1,500 were received for charity. The main feature of the April show, besides a great display of Orchids, will be an immense collection of Ixias, Sparaxis, Calceolarias and bulbous plants in bloom. We mention this as an example which is not unworthy of imitation by other gentlemen who have extensive greenhouses and grounds.

The work done at the New Haven Agricultural Experiment Station has long been favorably known, especially in the line of chemistry. Since the appointment of Professor Roland Thaxter as Mycologist excellent work has also been done on the subject of plant diseases. The report for 1889, issued in 1890, contains an interesting account of Fungi which attack Onions, an important crop in Connecticut. Professor Thaxter gives a detailed notice of the smut (*Urocystis cepulæ*), describing the germination of the spores, which he was the first to observe, the relation of this species to other species of Urocystis. He then considers the means of checking the disease, and shows by photographic reproductions the favorable effect of different chemical substances. He also discusses other Fungi injurious to Onions, and gives notes on Fungi injurious to other crops in Connecticut, the mildew of Lima Beans, caused by *Phytophthora Phaseoli*, Thaxter, a species related to the potato-rot, being especially interesting. A recent bulletin, issued last December, has a preliminary account of the potato-scab as it occurs in Connecticut. Professor Thaxter finds that in his region the scab is not due to the attack of a specific bacterium, as is supposed to be the case in the scab found in some other regions, but by a minute fungus which, except for its apparently true branching and aërial fructification, resembles in some respects certain of the polymorphic bacteria, but cannot as yet be referred to any described form and answers to no generic description.

The *North-western Lumberman* says: "For several years certain Germans have been experimenting with a view to using sawdust as a material for mechanical purposes. It was discovered years ago that vegetable fibre, after subjection to certain chemical action, and afterward to a pressure sufficient to expel all liquids from it, could be made into a substance almost indestructible by the elements, and of great utility in the mechanical and ornamental arts. The only trouble has been from the fact that but a few kinds of fibre were capable of the transformation under any existing formula. It might almost be said that there was only one fibre that, so employed, produced results satisfactory in respect of economy of manufacture and beauty and usefulness of the resulting product; and that one fibre is cotton, its delicate structure, strength and ready submission to the action of the necessary chemicals keeping it almost alone in its adaptability for the purpose. Thus far, almost the only result has been the manufacture of celluloid, which is unsuitable for anything but the finer mechanical uses. Scientists claim, however, that all vegetable fibre is, to a certain extent, identical—that is, having its essential constituents in common, there must be some means by which the coarser kinds can be transformed into similar substances. The experimental processes have included nearly the entire list of common vegetables, but within the last few years attention has been specially directed to the waste products of the saw-mill, especially the dust. The first results were the production of paper-pulp. But as only certain species of timber could be used satisfactorily for that, the experiments have been continued further with a view to not only using any kind of sawdust, but to broaden the field, so as to produce a substance that can be used for more general purposes than paper or celluloid, and which should, if possible, combine the best characteristics of both substances. A German scientific journal professes to give the results of the experiments in that country thus far. It claims the production of a substance made from common sawdust, by means of an acid process, that promises to be of great value. It is described as being exceedingly firm of texture and of great hardness, incapable of being bored by a common gimlet or of being penetrated by a nail, more impervious to the action of the elements than the ordinary metals or the common building stones, and practically indestructible by fire, a Bunsen burner simply charring the exterior surface. It is claimed to be stronger than timber for joists and girders and several times lighter than iron or steel, and, above all, the cost of manufacture is claimed to be so low as to bring it into competition with both wood and iron. It is said that experiments will be made to still further decrease the cost and increase its field of influence, and that its manufacture is to be pushed."

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The "Tree of the Janissaries."

THE famous tree, of which a picture is given on page 91, is an ancient Plane that stands in the so-called Court of the Janissaries in the Old Seraglio at Constantinople.

From the time of Mahomet II., in the fifteenth century, until the middle of our own century, the Old Seraglio was the residence of the sultans, and at once, says De Amicis,* "a royal palace, a fortress and a sanctuary. Here were the brain and the heart of Islamism. It was a city within a city, inhabited by a people and guarded by an army, embracing within its walls an infinite variety of edifices, places of pleasure and of horror." It stands, he continues, "upon the most eastern of the hills of Stamboul, which descend gently toward the Sea of Marmora, the mouth of the Bosporus and the Golden Horn, on the spot anciently occupied by the acropolis of Byzantium, by a portion of the city and a wing of the palace of the emperors. The whole hill is encircled at its base by a battlemented wall with towers, and along the sea this wall is also the city wall. This is the external boundary of the Seraglio. The Seraglio proper stands on the summit, surrounded in its turn by high walls, forming a sort of central redoubt in the great hill fortress." Formerly, when one looked down upon the hill from its upper battlements or from a minaret of St. Sophia, it looked like "a green forest composed of enormous trees, encircled by walls and towers and crowned with cannon and sentinels. Upon the highest point extended the vast rectangle of the Seraglio buildings, divided into three great courts, or rather into three small cities built around three unequal squares, from which arose a multitude of variously colored roofs, gilded domes and white minarets half-concealed in groves and gardens—a little metropolis, brilliant and irregular—at one point full of life and movement, at another mute and solitary; here all gilded and open to the sun; there inaccessible to every eye and plunged in perpetual shade; gay with infinite fountains, embellished with a thousand colors and silvery reflections in the marbles of the colonnades and in the waters of the little lakes."

The Old Seraglio was abandoned almost forty years ago by the son of Mahmoud II., with whom the history of our Plane-tree is most strikingly connected, when he built himself a new palace further westward on the Bosporus; and to-day its aspect is very different from that of old. It has been ravaged by fire and neglect, a railway bisects it, and bald new buildings for military use have been erected in its desolate courts. But certain parts are fairly well preserved, and among them the first enclosure of all, the Court of the Janissaries. This lies near one end of the ancient Hippodrome, and forms a long space, flanked on one side by the Church of St. Irene, which was founded by Constantine and converted by the Turks into an armory; and it is shaded by groups of large Plane-trees, among which the most conspicuous is the "Tree of the Janissaries." The court is entered by the Bab-Umaium, or August Gate, on either side of which is a niche where, hanging from nails, were exposed each morning for the edification of the people the heads of such notabilities as, in the twenty-four hours gone by, might have excited the animosity of the Sultan. And under the great Plane-tree still stand two small columns on which decapitations took place, while, according to local story, the janissaries were fond of hanging their victims from its branches. But the court and the Plane-tree get their modern names from the awful day—June 15th, 1826—which saw the annihilation of these terrible guards.

In the year 1808 Mahmoud II. became Sultan after his predecessor had been slain by the janissaries, and, to lessen the chances of another revolt, promptly assassinated his own brother. The reign thus begun in blood continued in disaster. A war with Russia cost Mahmoud some of his fairest European provinces, the Greek Revolution further contracted his territories, and he is chiefly remembered for the most extensive massacre that modern history records.

The whole corps of the guards had risen in insurrection and threatened to fire the four quarters of Constantinople. Gathering around him the troops that still were faithful, Mahmoud displayed from the Mosque of Achmet the "Standard of the Prophet," which is never unrolled save when the empire is in danger, and solemnly decreed the annihilation of the janissaries. His followers were then engaged in a "sacred war," in which the most murderous would be held the surest of heaven. The first cannon-shot tore a bloody furrow through the closely crowded guards, and from the beginning it was less a conflict than a slaughter. Fire was set to the barracks where many of the janissaries took refuge, and those who survived flame and sword were murdered singly at closer quarters until not one of the whole corps remained, while Mahmoud himself stood behind the railing of the Mosque of Achmed, in the Hippodrome, and from this safe distance directed the massacre, until some 20,000, or, as some say, even more had been slain.

The great Plane-tree which, in its fresh garment of June leafage, witnessed this horrible scene, is believed to be about 400 years old, and, despite its hollow trunk, is still a fine and vigorous specimen of the characteristic shade-tree of the East. Measurements taken last summer, when the photograph from which our illustration has been made was procured, give its girth as thirty-nine feet at three feet above the ground, so we must allow for a little exaggeration in the statement of De Amicis that "it takes ten men to embrace its trunk." These dimensions are not remarkable when compared with those given of some of the famous Plane-trees of antiquity. But, perhaps, we may also allow for a little exaggeration where the tape-line was not used to verify the descriptions of the giants associated with the names of Godfrey, Xerxes and Menelaus. The Tree of the Janissaries is nearly as large as the great American Plane on an island of the Ohio River, the measurements of which were put on record by Washington and Michaux.

*"Constantinople." By Edmondo De Amicis. Translated from the Seventh Italian Edition by Caroline Tilton.

The inhabitants of cold climates have little idea of the fierceness of the conflict which has been carried on from time immemorial between man and the ant tribe, and can hardly appreciate the extraordinary capacity shown by these tireless insects in their depredations upon the human race. In the tropics no satisfactory remedy has yet been devised by which the balance of advantage, always largely in favor of the ant as against man, can be overcome, and the insignificant-looking insect, by force of numbers, industry and perseverance, is master of the situation. Even in more temperate regions like some parts of our southern states ants are troublesome enemies, and the suggestion made in the November issue of the *Tropical Agriculturist*, published at Colombo, in Ceylon, may be worth trying in some parts of this country. The suggestion is, that ants may be frozen out of existence by means of a cask of the freezing mixture used by engineers in excavating in quicksands fixed over the entrance of the nest, the other entrances being closed with clay, with a tube placed in the hole also well packed with clay. The pressure from the head of liquid would, it is claimed, be sufficient to drive the freezing mixture down into the furthest recesses of the ants' galleries, which would almost instantly become lined with solid ice, or, at all events, would be made so cold that no ant, however tenacious of life it might be, could long survive the exposure. These freezing mixtures are not very expensive, and, as our contemporary suggests, it is possible that the progress of science has here achieved a victory in the interest of man for which so many generations have contended in vain.

Plants which Grow about Lynn, North Carolina.

Lynn is the name of a popular southern resort in Polk County, near the mountains of western North Carolina. It is situated in or near what is called the "Thermal Belt," at the foot of the Tryon and Warrior range, a mile and a half from Tryon Station on the Ashville and Spartenburg Railroad. The very mild climate, milder than that of many places farther south, and its fine scenery, its variety of fruits, and its rich native flora, etc., are to me its chief attractions. To come from New England, when it was covered with snow two feet deep, into a climate where the thermometer rises to ninety-five degrees in the sun at noon, and is not rarely fifty-five and sixty degrees at eight o'clock in the morning, is a change that cannot fail to gratify those who like mild weather. It is, however, something of an aggravation to a botanist to visit this country in winter, because he sees so many strange plants which he would like to know and cannot then determine.

Three species of evergreen Rhododendrons, *R. maximum* (the Great Laurel), *R. Catawbiense* and *R. punctatum*, are common to this region, but the last-named, I believe, is found only on the mountains. The Great Laurel (*R. maximum*) here attains its largest size, and it is not rare to find it over twenty feet high by five or six inches in diameter. With it and *R. Catawbiense*, but much more abundant than either, is found the Laurel (*Kalmia latifolia*), growing even taller and larger than the Great Laurel. Another handsome shrub often with these last mentioned, but more common along the banks of streams, is *Leucothœ Catesbœi*, a shrub one to three or four feet high, with evergreen, lanceolate-oblong, acuminate leaves, often six or eight inches long by a little more than an inch wide, shiny above, and dark or purplish green in color. At this season it has the handsomest foliage of any shrub I have seen here. It is quite hardy in southern New England, and ought to become a popular plant for certain places. Its flowers are small and not very showy, but its foliage is always handsome. Two or three Azaleas (now classed with Rhododendrons) also grow here. The most common is the Pinxter Flower, *Rhododendron nudiflorum*, which is almost everywhere, on the mountain-tops as well as the lower foot-hills. Another, the Flame-colored Azalea, *R. calendulaceum*, though not so generally distributed, is abundant in certain localities. It is a taller shrub than the Pinxter Flower, bearing its orange or flame-colored flowers in great profusion. It is a more southern plant than the former, yet quite hardy in southern Massachusetts.

Quite common on shaded banks and slopes of the lower foot-hills, its handsome evergreen foliage more conspicuous than at any other season, may be found *Galax aphylla*. Its round, heart-shaped, crenate-toothed leaves are more exposed to the sun in winter, when the deciduous trees have shed their leaves, and they have a darker and richer color in spring than in autumn. It is, I think, destined to become a popular plant when it is more generally known. It spreads from underground stems, and, though not so rapidly as to become a pest, it soon establishes itself in thick patches.

Another interesting shrub, everywhere common in the woods, is *Hydrangea radiata*. Its foliage is its chief attraction. The large ovate, heart-shaped leaves, white and downy underneath, light green above, are very handsome. It is not quite hardy in New England, and is killed down to the ground by severe weather; but it grows rapidly, and the new stems give an abundance of firm foliage each year, so that one gets about all the beauty of it even as far north as Springfield, Massachusetts.

Tecoma radicans (the Trumpet Creeper) is a great pest here. Everywhere—in the alluvial river-bottoms, in pastures, by the road-side, in Corn-fields or along the river-banks—it is abundant. Its roots penetrate deeply, and below the reach of cultivation. It is cut off each year by the plow, but it springs up again, so that at the next season it is about as large as it was the year before. These small plants in such fields never get large enough to bear seed, but are constantly replenished from the few large plants which are left along the fences and water-courses and which bear fruit. The seed is carried long distances by the wind, and most of the best farming land is constantly seeded from the large plants along the streams.

Tipularia discolor, the little Orchid which in some ways resembles our more northern Puttyroot (*Aplectrum hyemale*), and which is mentioned as "very scarce" in Gray's Manual, is scattered through the woods on the lower foot-hills and is much more common here than I ever saw Aplectrum at home. Its single green leaf is now quite conspicuous, and it is not rare to find ten or twenty-five plants within a radius of two feet.

There is not as large a number of Ferns in this section as I expected to see. *Aspidium acrosticoides* is the most common, and *Asplenium ebenium* next. *Aspidium marginale* is occasionally seen; also the Maiden Hair (*Adiantum pedatum*). On and under rocky cliffs and terraces in the mountains *Cheilanthes vestita* is very abundant, forming large patches which, even at this season, look beautifully fresh. This plant is one of the best Ferns for in-door cultivation in winter. It requires perfect drainage, however. Near it, in more sheltered nooks, but quite abundant where the right situations occur, grows what I take to be *Asplenium Trichomanes*, var. *incisum*, a more slender and shorter plant than its type is with us. On mossy rocks and the trunks of trees *Polypodium incanum* is found, sometimes quite abundant. It is the richest-looking Fern here at this season. *Cheilanthes tomentosa* grows with *C. vestita*, but I have never seen it so abundant. *Woodsia obtusa* and *Cystopteris fragiles* are also here. *Asplenium parvulum* is abundant in places, but not so common as the *A. Trichomanes*, var. *incisum*.

Southwick, Mass. *F. H. Horsford.*

The Perfume Industry in the United States.

During the recent development of horticulture in Florida and California many experiments have been made in the production of perfumes from flowers, and many of these have resulted successfully. There is little wonder, therefore, that inquiries are often made as to the possibility of growing flowers at a profit for manufacturing purposes in the genial climate of these and other states. Many of these inquiries are evidently from persons who have not even a vague idea of the result to be arrived at, not to speak of the details to be pursued, so that perhaps a few hints from one familiar with the products may be useful. Despite all the triumphs of modern chemical science which has produced synthetically many odors which are more or less useful, it still remains the fact that all high-class floral extracts, by whatever name known, are composed, to a greater or less extent, of one or more of the following odors: Violet, Rose, Jasmine, Acacia, Orange, Tuberose and Jonquil. With one or more of these in combination with some resins, oils and animal secretions, the skillful perfumer is able to imitate the odor of any other flower and produce pleasing bouquets. These odors are bought by the perfumer in the form of pomades, experience having taught that this is the only feasible means of securing them properly. Practically, then, our citizens have this problem before them very clearly, namely, to produce a highly charged pomade at a price which will enable them to compete with the flower-farm-

ers of southern France, who at present supply the world's markets. This pomade is marketed in eleven and twenty-two-pound tins, varying in price according to quality. It pays fifty per cent. duty, and the present wholesale price is about $2.50 per pound for violet, and $1.50 to $1.65 for the others.

Like all manufactures, the making of pomade cannot be taught by books, but a few hints may help the experimenter. The process of extracting odors is known as *enfleurage*, and it is carried on either with or without heat. Jasmine and Tuberose flowers are exposed to lard spread thinly on sheets of glass in suitable frames; this soon absorbs the odor, and by renewing the flowers the grease becomes saturated. The perfume of the other flowers is extracted by hot *enfleurage*. In this case an addition of beef fat is made to the lard (ensuring a higher melting point); this mixture is heated to the melting point, when the flowers are thrown in and rapidly stirred through the grease; the semi-liquid mass is put under a strong press with suitable filtering material until the flowers are separated. The process is continued till the grease is practically saturated with odor. These processes are simple, and with a supply of flowers there is no reason why a good pomade cannot be produced in this country.

Judging from some inquiries, however, it does not seem to be generally understood that the process depends primarily on securing perfectly pure and inodorless lard, which is by no means the same as the lard of commerce. No amount of perfume will make impure grease fragrant, and the perfumer will not buy an article of the kind at any price. In his laboratory the perfumer is one of the most practical of men, and buys his materials on their merits. It is just as important to have his pomades free from false odors as that his spirits should have no trace of fusel oil.

The process of securing lard free from albumen, membrane and blood, is as follows: Cut up the fat in small portions, separating the membranes as far as possible by hand, and wash till the water runs clear. Melt with a gentle heat in an iron or copper vessel over a water bath and continue till it becomes anhydrous, or free from water, which may be known by its becoming perfectly clear. Finish by filtering through a clean cloth. This lard will retain an odor which may be removed by remelting and adding a small portion of alum or common salt, and keeping it over the fire till a scum rises, which should be skimmed off. The salt must then be washed out and the lard again rendered anhydrous. Such lard is kept in a moderate temperature in tin, sealed from the air, and it will remain sweet as long as is usually necessary.

It will be well for one who intends to try the perfume industry to secure a sample of the French pomade from some perfumer, so that an idea may be had of the strength of odor desired in the market. The prospect of success offered by this industry can only be learned by experiment, but it is certain that no careless methods will answer. As in other things, there is room at the top, and high-class products are certain of a market.

New York. *J. N.*

Our Trees in Ice-storms.

IN the changing aspects of landscape which Nature, even in our northern winters, constantly lays before us, there are few which furnish more enchanting pictures than some of the so-called ice-storms which occasionally, but fortunately rarely, occur. When, owing to peculiar conditions of humidity and temperature, every limb and branchlet of tree and shrub is covered with a heavy coating of clear ice, the ground white with snow and the sunlight is bright on the whole scene, we are treated to an exhibition such as the most careless and unobservant cannot fail to appreciate in some degree. Such a storm prevailed over a large portion of New England during the last week of January. While the storm, which results in the formation of clear, transparent, solid ice on every exposed object, produces perhaps the most beautiful effect, it is also the most likely to be destructive to arborescent vegetation because of its greater weight and the tenacity with which it clings during wind-storms and until dissolved by melting temperatures. In the late storm the weight of the ice was often twelve or fifteen times as great as that of the supporting branchlet it enclosed.

When the limbs become covered with soft snow there is usually not so much danger to trees because the weight is less in proportion to the bulk and the masses are more easily shaken off in a wind-storm. Such snow-storms, however, are sometimes hurtful to many kinds of evergreens. The beautiful glistening spiculæ, often produced on every object in foggy weather, are rarely sufficiently abundant and heavy to do much damage. In Europe, however, somewhat similar ice formations have been recorded as doing much damage to trees; and in English journals, under the name of "rime," there are frequent notices of injuries caused by this hoar-frost. In this case the greatest accumulation of icy particles usually takes place on the under side of the branches or on the side opposite to the direction of any slight wind which may prevail at the time of formation. It takes the form of delicate spiculæ or of flat sheets of ice as thin as paper, and sometimes two inches wide. The accumulation of this has been so great at times that large limbs of such sturdy trees as Oaks and Elms have been broken down by the weight. In some parts of Europe, where the peasants are allowed the use of all fallen wood, the poor people are very apt to look upon such occurrences as providential dispensations.

The beauty of ice-coated trees depends largely on the manner in which the different species branch or form spray, and the injury these storms inflict is very different upon different trees. Fortunately these storms are rare, for if they were of frequent occurrence it would be almost impossible to grow some of our most valued shade-trees, or at least to preserve their symmetry and normal appearance. The frequent loss of branches and leading shoots would give most kinds of trees a ragged and misshapen aspect, which would make them unsightly. But, besides the direct injury to the trees resulting from the loss of limbs, there is the increased liability to attacks by insects and destructive fungi which may gain their first entrance into the wood of the tree through the exposed stump of some broken limb or stem. The danger of further injury from these causes is not so generally understood as could be desired. Wherever lacerated wounds occur on choice or valued specimens of trees they should be cut or pared smooth and carefully covered with a protecting coat of coal tar or some similar substance calculated to prevent the entrance of boring insects or of wood-destroying fungi.

Of all our trees few are liable to suffer so severely in the ice-storm as the native White Pine. The wood of its branches is more brittle than in the majority of trees, and as every one of the long leaves or cluster of leaves becomes incased in a heavy icy covering, or supports its proportion of snow, the weight on the limbs becomes out of proportion to that which most other trees have to bear, and the slightest movement by wind or the suddenly added weight of a bird is often sufficient to cause the branches to snap off. As the weighted branches usually rest upon and partially support each other, the breaking of an upper limb often causes much greater destruction in its fall. Such species as the Scotch and Pitch Pines, which possess shorter, stouter branches, are apparently not nearly so liable to suffer injury. The Spruces may become covered with heavy sheets of ice or snow, but, as the branches are tough and elastic as well as comparatively short, they rarely break; and the terminal shoot, being stout, and bearing few branches or leaves, hardly ever bends or is moved from its erect position. The common Savin, or Red Cedar (*J. Virginiana*), usually assumes a slender and pyramidal form in our northern latitudes, and in these ice-storms the narrow spire-like tops undergo an astonishing amount of bending before they will break. But if the leading shaft does break under the strain, the beauty of the form of the tree is forever ruined.

While the evergreens appear most beautiful in a snow-storm, they lack the charm of deciduous trees when ice-laden and ice-bound. In all the variety of leafless limbs and branches the beauty of our native American Elms is seldom equaled under these trying circumstances. The long slender branches present an unusually pendulous appearance when ice-bound. As the branchlets are numerous and each bears its proportion of ice, the branches become more heavily burdened than most of the coarser-branched trees of other genera. Breaking of the limbs may occur at any point, but it is noticeably more apt to take place where a smaller branch diverges at a sharp angle from a larger one; and limbs, which from any cause have become defective or weakened, are very likely to be exposed by ruptures or breaks. Twistings and partial splittings of sound branches sometimes occur which are not readily detected at the time.

Among deciduous trees, the much-planted White or Silver Maple is one of the most subject to serious injury under similar conditions. The wood does not bear a great strain, and the break is usually rough and jagged. The loss of buds or small tips of branches in these storms is usually unimportant, and if what is sometimes carelessly called "nature's pruning" was never more serious, little harm would be done.

Some of the larger shrubs are liable to be much broken, while others bend until the strain is relieved by their ice-covered tips resting upon the ground. The elasticity and supple-

ness of our slender White Birches (*B. populifolia*) is sometimes shown by the fact that trees as much as thirty-five feet high will bend until their tops touch the ground, and will remain in this position until released by a thaw, when they once more assume their natural attitude.

Those deciduous trees which have not a very branching habit, or whose lateral branches are few, are rarely or never affected by the average ice-storm. Such are the Horse-chestnuts, Walnuts, Catalpas and even the Magnolias. It is not easily conceived that the thick naked branches of the Kentucky Coffee-tree (Gymnocladus) would ever be affected, as their burden of ice must be much smaller than that of diffusely branched trees; but, of course, it is possible for such accumulations of ice to take place under which no tree could remain uninjured.

Jamaica Plain. *J. G. Jack.*

Recent Botanical Discoveries in China and Eastern Burma.—II.

Beginning with the trees, we find, as in Mexico, at somewhat higher levels, that Pines and Oaks predominate. Two species of the former and nine of the latter were collected. The common Pine is *Pinus Kasya*, a species abounding in Assam, Chittagong and Burma; and the other, *P. Merkusii*, inhabits Martaban, Tenasserim, Sumatra and Borneo. Some of the Oaks are very fine, both in foliage and in fruit. Associated with these Oaks and Pines are a Willow, a Birch, replaced in the Mexican uplands by an Alder, two species of Engelhardtia, a species of Pyrus, and several other members of the *Pomaceæ*, an Ash, one or more Figs, a Mulberry and a Holoptelea, a genus of trees next to the Elms. Intermixed with the foregoing trees are members of genera chiefly tropical or sub-tropical, such as Dalbergia, Bauhinia, Acacia, Albizzia, Melastoma, Marlea, Vernonia, Wightia (a remarkable tree of the *Scrophularinaceæ*), Helicia (*Proteaceæ*), Lindera and several *Euphorbiaceæ*.

Among shrubs are Brambles and Roses, Honeysuckles, Privets, Jasmines, Barberries and Viburnums, associated with genera of a less decided temperate type, such as Lagerstræmia, Capparis, Pittosporum, Actinidia, Evonymus, Millettia, Woodfordia, and many others.

Especially noteworthy among the new shrubs are *Rosa gigantea* and *Lonicera Hildebrandiana*, each in its genus surpassing all previously described species in the size of its flowers. The Rose is an exceedingly robust kind, very closely allied in botanical characters to *Rosa Indica*. It forms thick, woody stems, and climbs to the tops of lofty trees, clothes them with long hanging branches, bedecked with beautiful white flowers, sometimes exceeding five inches in diameter. General Collett describes it as one of the most striking ornaments of the forest, reminding one, when seen in the distance, of a large-flowered Clematis rather than of a Rose. Fortunately, General Collett secured abundance of good seeds, and vigorous plants are now growing at Kew and other places in the United Kingdom, though nobody has yet succeeded in flowering it. Talking of its seed reminds me that it is the largest in the genus, being about half an inch long. When I say seeds, botanists will understand that I mean "carpels." The pome-like fruit is an inch and a half in diameter. In justice to the original discoverer of this fine Rose, it should be put on record that, although General Collett rediscovered it in a new and distant locality, gave it a name, and sent seeds of it to England, which have germinated, and is entitled to all the honor appertaining thereto, to Dr. G. Watt, of the Indian Educational Department, belongs the credit of having first discovered it. Dr. Watt was attached as Botanist to a Government demarcation survey expedition to Muneypore in 1881–82, and made extensive botanical collections, including the Rose in question, which he regarded as a new species, and to which he gave a manuscript name, but it was never published.

The Honeysuckles of the Shan Hills, so far as known, belong to three species, one of which, *Lonicera Hildebrandiana*, is an exceedingly showy, apparently evergreen, shrub with dark, thick, glossy leaves and handsome crimson flowers, seven inches long, and borne in pairs in the axils of the upper leaves and at the tips of the branches. General Collett found this fine Honeysuckle in only one locality, and only one plant was seen; but it is probably abundant in other localities, as he was informed that the flowers were much used in decorating the temples at Pindiah. When collected it was almost past flowering, but the fruit was not yet ripe, so there was no chance of introducing it into our gardens. Now that the country is open, however, we should not have long to wait for this and many other ornamental plants growing in the same region.

A tall, bushy Lespedeza (*L. Prainii*) is a highly ornamental shrub some ten feet high, bearing large panicles of fine purple-blue flowers, and would be well worth cultivating; and there are several other pretty species of the same genus.

Prominent among the numerous *Leguminosæ* of the region are several arboreous and shrubby species of the large Asiatic genus Millettia, a genus closely allied in botanical character to Wistaria, and probably hardly inferior to it in the beauty of the flowers of many of the species. About twenty-five species are known to inhabit Burma, most of them being endemic, and three fine new species are described from the Shan Hills. *Millettia macrostachya* is a shrub or small tree with pinnate leaves a foot to eighteen inches long and clustered flower-spikes, or racemes, as long as or even longer than the leaves, bearing a profusion of pretty pink or rose-colored flowers about an inch long. *Millettia multiflora* and *M. Dorwardi* are hardly less beautiful. *Osteomeles anthyllidifolia*, a species of a genus otherwise confined to the Andes of South America, deserves notice, not alone as an ornamental shrub, but also on account of its singular distribution. It was first described by Lindley, in 1822, from specimens collected by Alexander Menzies in the Sandwich Islands, and it has since been collected in Pitcairn Island, Maingaia, the Bonin group, the Luchu group, Japan, central China and now from the Shan Hills. It is a dense bush, growing gregariously and presenting a pretty sight when covered with its white Hawthorn-like flowers, contrasting well with the dark-green, finely pinnate leaves. The somewhat fleshy fruit is probably a favorite food of some birds; hence, perhaps, the wide distribution of this shrub.

Before leaving the shrubby element in the flora of the Shan Hills a word should be said respecting the shrubby parasites that live on the Oak-trees. The Oak-forests here support a considerable variety of both parasites and epiphytes; but the latter are by no means so numerous and varied as those found in the Oak-forests of Mexico, consisting of a few species belonging to the genera Dendrobium, Bulbophyllum and Cirrhopetalum, and two or three other genera, to some of which I shall have occasion to refer again. On the other hand, the trees in the upper forest-region, from about 4,000 to 5,000 feet, are much infested by parasitic plants of the genera Loranthus and Viscum. Altogether seven species were collected, five of the former genus and two of the latter. The Loranthi are very conspicuous when in flower, two, previously undescribed, especially so, having very large flowers of a brilliant dark crimson. A remarkable biological phenomenon in connection with these parasites merits mention here. Structurally the *Loranthaceæ* and *Santalaceæ* are closely allied; but, whereas the former are mostly parasitic on the branches and trunks of trees and shrubs, the latter are mostly parasitic on the roots of other plants, at least in an early stage of their existence. A curious exception is offered by the genus Phacellaria (*Santalaceæ*), of which four species are now known from eastern India and Burma. These are small, leafless, shrubby plants, with slender clustered branches, and, so far as our present knowledge goes, they always grow on other parasites. General Collett collected two species, one of which was previously undescribed; and one of these was parasitic on a Loranthus, the other on a Viscum! Similar instances are not absolutely unknown in other plants. Thus, *Tupeia antarctica*, a member of the *Loranthaceæ* inhabiting New Zealand, has been found growing on *Loranthus microphyllus*, though it also grows on a variety of other shrubs and rees.

Kew. *W. Botting Hemsley.*

New or Little Known Plants.

Aster macrophyllus.

THIS handsome plant is one of the most common of the Asters which inhabit, in such vast quantities, the northern and eastern states. It often almost covers the ground along borders of the forest, where it finds the rich, moist soil in which this species delights. The large, heart-shaped, radical leaves, which grow to a large size early in the season, are very conspicuous in these situations and draw attention to this plant long before the flowers make their appearance. These radical leaves are sometimes eight or ten inches long and four or five inches wide; they are broadly ovate, reniform-cordate, and are coarsely and sharply serrate. The flower-stems are angled, three or four feet tall, and bear ovate-oblong, winged-petioled

Fig. 18.—Aster macrophyllus.—See page 88.

leaves, the uppermost becoming sessile by a broad base. The flowers are produced in corymbose cymes, and have white or bluish purple rays.

Aster macrophyllus, which is one of the most variable of our Asters (see figure above), is distributed from Canada and Manitoba to the mountains of Carolina and Georgia. There are several species with showier and more beautiful flowers, perhaps, and, therefore, better worth a place in the garden. None of the American Asters, however, are more useful than this species to naturalize in the wild garden under the shade of trees or by the borders of woodland-walks or in forest-glades.

Foreign Correspondence.

London Letter.

Hybrid Calanthes.—It is thirty-five years now since Mr. Dominy, at that time manager to Messrs. J. Veitch & Sons at their Exeter nursery, raised the invaluable *Calanthe Veitchii* by crossing *C. vestita* with *C. rosea*. At that time the latter was known as a species of Lematodes, and the fact that this was the first supposed bigeneric cross naturally caused some excitement among botanists. Mr. Bentham, however, deprived the hybrid of some of its interest when, in 1881, he wrote: "The facility with which *Lematodes rosea* can be made to hybridize with *Calanthe vestita* has been given as an instance of ready hybridization between two distinct genera; but the fact appears to be that *L. rosea* itself has all the characters of Calanthe, and is, indeed, a species very nearly allied in every respect to *C. vestita*." As a garden Orchid, however, *C. Veitchii* remains among the very finest hybrids ever raised, superior as a decorative plant to both its parents, and at least the equal of any other seedling Calanthe of garden origin. Well grown, it produces many flowered scapes a yard long, perfect as regards elegance and the arrangement of the flowers, which in their turn are pretty in form and colored a bright rose. Then there are the varieties: Alba, with pure white flowers, and Versicolor, which is peculiar in having white, rose and variegated flowers on the same spike. A remarkable feature in this hybrid is its being at least as dark in color as *C. rosea*, although its other parent is almost wholly white.

Twenty years elapsed between the birth of *C. Veitchii* and the next hybrid Calanthe, also a Veitchian production, namely, *C. Sedeni*, the progeny of *C. Veitchii* crossed with the red-eyed variety of *C. vestita*. This is a beautiful plant, the flowers being rose-carmine, almost crimson, and of good size and substance. The unexpected often happens in hybridizing experiments, as is shown by the form and color of the hybrid figured in Garden and Forest (p. 17) under the name of *C. Eyermanii*. By simply reversing the parentage Mr. Gardner obtained a cross with flowers half as large again as *C. Veitchii* and "whiter even that *C. vestita*"—if that is possible. Hybrids, crosses, seedlings of Calanthes, have been produced in abundance in English collections recently, Sir Trevor Lawrence and Mr. Norman Cookson having raised some exceedingly pretty-flowered ones. Many of these have not been named. They have an interest for horticulturists, as they reveal a disposition in *C. vestita* and its near allies to cross and sport to almost any extent; and Calanthes of this section are so exceptionally useful that we cannot well have too many of them.

According to Messrs. Veitch, the raising of hybrid Calanthes is comparatively quick work. The capsule usually ripens in three or four months, and the seed takes from two to three months more to germinate; the seedlings, under favorable circumstances, will flower in the third or fourth year. The multiplication of Calanthes is equally rapid by means of dividing the pseudo-bulbs. In short, Calanthes have proved themselves in every way adapted for the every-day greenhouse, and as deserving of general cultivation as the most popular of winter-flowering plants. They have been grown at Kew some years for the decoration of the conservatory.

The section of this genus represented by *C. veratrifolia* differs widely from the *C. vestita* group, so widely, indeed, as to appear to have nothing in common with it. But among them there are some beautiful-flowered species which have the commendable quality of thriving in a greenhouse temperature all the year round. They enjoy copious watering, they are evergreen, and their tall spikes of flowers are a durable attraction at various times of the year. *C. Masuca* is in flower now. It has a spike two feet long, and flowers one and a half inches across, colored soft lavender-purple. *C. veratrifolia* will shortly produce its tall scapes of pure white flowers; *C. Natalensis*, of similar habit to the last and colored lilac, with a reddish lip, also flowers in spring. The only hybrid in this section is *C. Dominyi*, raised from *C. Masuca* and *C. furcata* about the same time as *C. Veitchii*, and by the same operator.

The genus Phajus has proved so near an ally to Calanthe as to hybridize with it. *P. irrovatus* is the offspring of *P. grandifolius* and *C. vestita*, while in *P. Sedeni* we have a hybrid between *P. grandifolius* and *C. Veitchii*.

Two new Grapes have lately been brought into notice, and are likely to become valuable acquisitions as high-class varieties for indoor cultivation. They were raised by Mr. Myles, gardener to Lady Hutt, Appley Towers, Ryde, Isle of Wight, who obtained them by fertilizing six flowers of Gros Colmar with pollen from Meredith's Alicante. One is named Lady Hutt, and may be called a white skinned Gros Colmar, but better in flavor than that popular variety. The second is called Appley Towers, and has large round berries, black, thin-skinned, perfect in flesh and flavor, and an excellent keeper. It is somewhat remarkable that two first-class varieties should be the outcome of so small an experiment, and that they should differ considerably, not only in color, but in form and flavor, from each other.

Fruit-trees in Ornamental Gardening.—A suggestion that many fruit-trees deserve to be planted for decorative effect in shrubberies and on lawns appears in this week's number of the *Gardeners' Magazine*. Although not new, the idea is one that deserves attention. We are apt to overlook the ornamental character in things otherwise useful. Double Cherries, Almonds, Flowering Currants and the species of Prunus are not uncommon features of good shrubberies or as lawn specimens. But why stick at the flowers? There are few more beautiful pictures than a tree well-laden with richly colored apples, or cherries, or peaches, or plums, or pears. Nor have we anything among berried bushes so effective as the Red, Black and White Currants, while many varieties of Gooseberries are not without considerable claims as decorative objects. It is a fact that if all these trees produced inedible fruit they would be universal favorites for planting for effect. In an old garden where I worked when a boy the old kitchen-garden was included with the lawn and shrubberies, but some favorite old Apple-trees were left as lawn specimens. They were beautiful when in flower, equally beautiful when laden with rosy fruit, and last, but not least, they contributed considerably to the requirements of the kitchen.

Amorphophallus campanulatus.—Some people appear to have confused this plant with *A. Titanum*, if one may be guided by an advertisement which has lately been circulated in England and America. The first-named is a well-known Indian Aroid with tubers from six inches to a foot in diameter; leaves four feet high, and vasiform flowers a foot in diameter, green and vinous purple in color, with a large chocolate-colored spadix, and emitting when fresh a disgusting odor. The plant is strictly tropical, will not thrive in cultivation except when grown in a hot, moist stove, and is not easily flowered. When in flower it is a curiosity, which finds little admiration, its odor as well as its dull colors being all against it. Of course it is widely different in stature, form of flower and interest from the Sumatran *A. Titanum*, of which the only plant known in cultivation is that which flowered at Kew in 1889. There is an Amorphophallus which comes from northern China, and is almost hardy in England—namely, *A. Rivieri*, which is sometimes used here as a bedding plant on account of its ornamental leaves—but it rarely flowers, and when it does it differs considerably from *A. Titanum* and *A. campanulatus*. No true Amorphophallus is found in Africa.

London. *W. Watson.*

Cultural Department.

Notes from the Harvard Botanic Garden.

Phyllanthus nivosus.—There are but few members of the genus Phyllanthus worthy of cultivation for decorative purposes. *P. nivosus*, however, is one of the most notable exceptions. It is a native of the South Sea Islands, and was introduced in 1873. The plant is a deciduous shrub of free-branching habit, with the alternate, ovate leaves two inches long and closely arranged on the branches. The flowers are inconspicuous; but their lack of showiness is made good in the foliage, which, under certain conditions, develops a beautiful variegation of green and white. As the leaves become old they turn to a pale green color, and they then produce a nice effect with the long branches of younger ones, in many of which the green is almost entirely absent. Specimens of this plant should be kept somewhat closely root-bound and freely exposed to the light, in order to secure the most pleasing combinations of color. A stove temperature is essential to their luxuriant growth, and a mixture in equal parts of loam, peat and sand should be used in potting. Propagation is effected by planting cuttings, prepared from firm material, in sandy soil and placing them in bottom heat. The plants grow quickly, and soon form handsome specimens under the treatment generally accorded stove plants.

Senecio Petasites.—This would be found a most valuable plant for those who have large conservatories to be kept attractive during winter. It is a native of Mexico, and has been known in English gardens since 1812, when it was introduced by means of seeds, and first flowered there during the latter part of the same year in the gardens of a Mr. A. B. Lambert. Then, and for many years afterward, it was known only as

Fig. 19.—Ancient Plane-tree in Constantinople.—See page 85.

Cineraria Petasites, and in 1813 it was figured in the *Botanical Magazine* under that name. It is an evergreen shrub of bold habit; the cylindrical stems robust and erect, and from three to four feet high; the leaves alternate, circular, with sinuously lobed margin, cordate at the base, dark green above and pale green beneath, and from six to twelve inches broad, with petioles as long as the blades are wide. These parts of the plant are all more or less downy. The flowers, each a trifle more than an inch across, with the disk-florets brownish, and those of the ray of a bright yellow color, are produced in enor-

mous terminal panicles, beginning to open about the middle of December, remaining attractive until late in February. The handsome foliage renders these plants very serviceable, even when not in bloom, in imparting an artistic effect to arrangements of flowering and other less massive foliage plants. The sombre solidity of this Senecio is much relieved by the elegance and brightness of the flowers, which when cut are of further utility in that they keep fresh in water for a considerable period. The plant is of exceptionally easy culture, and during the flowering season the temperature may fall as low as forty degrees Fahrenheit without injurious results. The young branches which develop on the sides of the main stems after the flowering season make excellent cuttings. They should be taken when from four to five inches long, with a slight heel of the older material, and inserted in sandy soil, taking care to place them where an ordinary amount of bottom heat is combined with shade and a close, moist atmosphere. The shading should be removed when the cuttings are rooted. It will be necessary to advance their growth in pots until they may be trusted with safety out-of-doors in the open garden. Here they must have abundant space, for, under ordinary conditions, they grow vigorously. Early in September they should be taken up and potted and placed under cover. In the greenhouse they thrive best, with plenty of room, air and light, otherwise their requirements are similar to those of the general run of greenhouse plants. Larger but no less ornamental specimens are obtained by cutting down the old plants after the flowering season to within a few inches of the soil. Young shoots soon push from the old stumps, which in the planting-out season are turned out of the pots and transferred to the garden like younger plants, the greater part of the old soil having, meanwhile, been shaken from the roots. Their subsequent treatment does not differ from that prescribed for young plants.

Stereptocarpi in Winter.—Our friends across the Atlantic are ahead of us in appreciation of the good qualities of these plants. The genus, although it comprises many excellent garden plants, is scarcely known here. This is all the more surprising when it is considered that at least one of the species, *S. Rexii*, has been cultivated in Europe since 1824, when it was introduced from south Africa. But it is only within the past few years that these plants have attracted much attention even in Europe. The recent appearance of a number of meritorious hybrids is probably the occasion of their rapidly increasing popularity. *S. Rexii* has been known in cultivation longer than any of the other species, and it has proved to be a most serviceable plant in the hands of hybridizers. It is, with the exception, perhaps, of *S. Gardeni*, the handsomest species of the genus. The plant is stemless ; the prostrate leaves are ovate-oblong, crenate, villous, bright green and much wrinkled on the upper surface, paler with prominent midrib and veins beneath. The erect, slender scapes are from six to nine inches in length, and they rarely bear more than one flower. The trumpet-shaped carolla, of blue-lilac color, is two inches long by an inch and a half wide, five-lobed, the three lower lobes being larger than those above and veined far into the throat with deep purple. *S. Rexii* and *S. polyantha*—a species in which the panicles of small flowers rise from the base of one large leaf that develops to the almost entire suppression of the others—are both in bloom at the present time. These plants usually flower during the summer months, but they may easily be had in bloom at this season by sowing the seeds late in spring or early in summer. A somewhat sandy soil, plenty of light, and an intermediate temperature are primary essentials to the successful cultivation of these greenhouse plants.

Cambridge, Mass. *M. Barker.*

Flowering Plants in the Hot-house.

Bougainvillea glabra.—This remarkably handsome plant has long been known in cultivation, but it deserves to be more largely grown, for few summer-flowering plants surpass it in effectiveness when used for conservatory decoration, and the flowers are also valuable for cutting. It is of scandent or semi-scandent habit, but may be kept by pruning in the condition of a good pot plant, and as it flowers very freely, small plants will be found very useful, while large ones can be called gorgeous without exaggeration. The foliage of this species is entire, bright green and smooth, the latter being a good characteristic to remember, as the other members of the genus are more or less downy or pubescent. The flowers proper are insignificant both in color and size, but the chief beauty of the plant is found in the bracts which surround them. These are deep rose in color and produced on the tips of the branchlets in great quantity.

The Bougainvilleas are readily propagated by cuttings made from firm young wood and placed in a propagating frame or in a snug corner of the conservatory, and the young plants should be potted on as they become root-bound in good, open loam and in well-drained pots. The most satisfactory method in order to secure a good crop of flowers is to dry these plants off during the winter until the wood is well ripened, after which they may be trimmed into shape, and then started into growth by a little additional heat and frequent syringing. When showing flower some liquid manure will be beneficial.

Gloriosa superba.—This also is an old plant, but a very pretty one. It is a bulbous-rooted stove climber, and is essentially a summer-blooming plant. The bulbs require a season of rest, as Gloxinias and other plants of similar habit do. The plant has bright green leaves, rather narrow and sessile, with a midrib lengthened out into a long tendril, by means of which the plant is enabled to climb. The flowers are six-petaled, the petals undulate and standing erect, while the color shades from orange to red. Altogether this is a showy plant, and has the merit of being quite easy to grow in a warm house, if the bulbs are not disturbed after they have started into growth. The most suitable soil for it is an open mixture of loam, peat and sand, with some old dry cow dung for fertilizer, and the bulbs are best shaken out of the old soil before active growth commences, for they are somewhat impatient of any disturbance of the young roots, and therefore should be placed in the pots in which they are to bloom.

Gloriosas are but little subject to the attacks of insects, red spider being the most likely pest unless the plants are regularly syringed until they begin to bloom. It is propagated by seeds, and also by offsets from the bulbs, the first method being probably the most satisfactory. After the blooming season is over water should gradually be withheld until the season's growth is finished, after which the pots may be stored away under the benches or in some other convenient place until required the following season.

Tabernæmontana coronaria.—This is another plant often found among the stove-flowering collections, and it is probably the best-known representative of a large genus, though, strange as it may seem, its native country is not positively known. It is under cultivation in various parts of India, from whence it was most probably introduced into European gardens. *T. coronaria* bears some resemblance in growth to a Gardenia, while the flowers are pure white, tubular, and with wide-spread petals like a Jasmine, to which they also have some similarity in perfume. The peduncles are produced from the forks of the branches, and are furnished with from two to six flowers. There is a variety with double flowers which resemble miniature Gardenias, though their odor is not quite so pronounced.

The Tabernæmontanas are of easy cultivation in a warm house, and possibly might be grown on in the open ground during summer. They would be in danger, however, of losing their foliage, unless very carefully lifted. These plants are increased by cuttings, which should be placed on bottom heat, and, if not allowed to flag, they soon root. Any ordinary well-drained soil will answer if sufficient sand is added when necessary, to make it more open. A moderate shade will be found beneficial.

Holmesburg, Pa. *W. H. Taplin.*

Plants for Shady Places.

In most gardens of any extent there are places in which it is difficult to get grass to grow—shaded spots, for example, like those under the dark shadow of evergreen trees and sometimes under trees that are deciduous. Bare, unsightly patches of this description are an eyesore until taken in hand and covered with some of the many hardy plants suitable for this purpose, and those which may be relied upon to thrive under this adverse condition, and that, too, with but little attention after the first year. One of the most useful, and, at the same time ornamental, of trailing plants we have is the Trailing Myrtle, which, as often happens with common names, is not a Myrtle at all, but a Vinca. It is also known as Periwinkle, which is the most suitable common name, being a corruption of the old Latin name, Pervinca, applied to the genus by Pliny. Of this Periwinkle or *Vinca minor* there are many varieties, all low, trailing, evergreen plants, with flowers that are either single or double, blue or white, as the case may be, and all well-known to every one who takes an interest in hardy plants. In addition to the varieties named there is a variegated form of *Vinca minor* which, to my mind, is the prettiest of all. The young growth in spring is bright yellow and green, and it is covered with starry blue flowers, which stand up above the carpet

made by the previous year's growth, which with age assumes a deep olive green.

When the space to be covered is under the shade of trees very little preparation is necessary; but as the planting is for permanent effect, a good coat of manure should be dug in deeply, for it will be found that Chickweed will be troublesome the first season if the manure is placed near the surface. Weeds, however, will be choked out the second season as the Periwinkle roots descend to the richer soil. After the ground is prepared, small pieces of the Periwinkle with roots attached should be planted in rows, the plants being set a foot apart each way. Little attention besides weeding will be necessary the first year, and a neat covering will be secured, and, as the plant is evergreen, it will always be pleasing, and especially so in the spring months, when it is in flower. If it is desired to give the beds a more showy appearance it is a simple matter to place the plants a little further apart, and place between each a bulb of any of the varieties of Narcissus, such as *N. poeticus*, *N. princeps*, *N. trumpet major* and others that are strong and robust. But if Narcissus are planted they should be set six to eight inches deep, according to the texture of the soil; in light soils Narcissus can be safely planted eight inches deep, or even deeper. In a similar way Lily of the Valley may be interspersed among the Periwinkles if the latter be the blue-flowered variety, as the Lilies will also succeed admirably in a shady position for an indefinite period. The Wood Lilies or Trilliums of the strong-growing kinds, as *T. grandiflorum*, *T. erectum* and its white variety, *T. cernuum*, also, though not so showy as others, with the Pacific coast species, such as *T. ovatum*, *T. petiolatum*, *T. sessile* and others, are all hardy, and, although not so often met with in cultivation, are equally useful for the purpose named. Numerous other spring-flowering bulbs will suggest themselves to the planter to be introduced among the setting of Periwinkle as fancy may suggest, but it is best not to attempt, under trees, any display that would be in season at any other time than the spring or early summer months for obvious reasons. Under trees the soil during the warmer season is much drier than in open cultivated ground. This would not in any way interfere with the ripening of bulbs, quite the reverse, but might seriously interfere with the success of an attempt to use other plants for a later display.

There are other plants of trailing habit which will answer in place of *Vinca minor*. *Lysimachia Nummularia* is sometimes used, but it is such a rampant grower that it often gives serious trouble to keep it within reasonable bounds. Here in Massachusetts it may often be seen as an escape from cottage gardens, monopolizing the road-side to the exclusion of grasses and other native plants. But where a vigorous growing plant is desired it might possibly be used with advantage.

South Lancaster, Mass. *E. O. Orpet.*

Sciadopitys verticellata.—The Umbrella Pine seems as thoroughly hardy here as any of the conifers we have received from Japan, and it holds its green color well through the coldest weather. One specimen here is eight feet six inches high. I do not know its exact age, but it has made fifteen annual growths from a point eighteen inches above the ground, and, as it grows slowly at first, this tree is perhaps nearly twenty years old. Last year it increased in height a foot, and the year before ten inches. We need a wider experience before we can be sure what situation it prefers. It does not seem particular about soils. The specimen here mentioned stands in soil eighteen inches deep, below which is a rock bottom.

Germantown, Pa. *Joseph Meehan.*

The Forest.

Forestry on the Prairies.

WE have in former numbers made allusion to the Farlington forest in Kansas, or, as it is called on the map, the "Tree Farm," belonging to the Kansas City, Fort Scott and Memphis Railroad Company. Something like 500 acres of prairie were broken up about twelve years ago and planted with different kinds of forest-tree seedlings. The experiment was particularly interesting as the most extensive plantation of the kind that had been then made on the prairies in that longitude, and because the planting was contracted for on terms which were novel and worthy of trial. Messrs. Robert Douglas & Sons agreed to prepare the ground, furnish the trees and plant them four feet apart each way, and then take charge of the plantation for a certain number of years, and deliver the forest to the Company, with the guarantee that each acre should contain a certain number of trees which should be of a given size and completely shade the ground. After the trees have reached this condition it was assumed that they could fight their own battles against the weeds and prairie grass. The advantages of the arrangement seemed to be that the critical work of planting as well as the care of the trees in their earliest and feeblest stages would be in the hands of experts, and good care was secured by the fact that the forest was to have attained a certain established growth before it was delivered over to its owners. Below we give some of the chief points in the report of Mr. George E. Kessler, the Superintendent of the work, and we add some figures relating to the size of the trees, which we gather from tables of measurements in Mr. Kessler's report, but which are too long and elaborate for our purpose.

The diameter measurements are taken at a point one foot above the surface of the ground. The Catalpas planted in 1880, standing in good loam in rows, next to the forest-road, average 5.7 inches in diameter, some of them reaching a diameter of seven inches. Their height will average twenty-five feet. Trees in rows some fifty feet from the forest-road average 4.5 inches in diameter. Trees of the same year's planting on higher ground and thinner soil, will average along the road 4.6 inches, and fifty feet from the road 3.07 inches in diameter with a height of twenty-one feet. Black Cherry-trees, planted in 1878 on good land, are now from twenty-five to thirty-five feet high and average 4.35 inches in diameter. Black Walnuts, planted in 1878, standing mixed with Chestnut and Cherry-trees, are twenty-eight feet high and 6.37 inches in diameter. Chestnuts, planted in 1878 among Cherry-trees, average 2.5 inches in diameter and eighteen feet high. Black Walnuts standing alone, and planted four feet apart each way in 1878, are now eighteen feet high and three inches in diameter. Box Elders planted the same year show a weak growth and look starved. Trees of *Catalpa bignonioides* planted in 1878 are 3.8 inches in diameter and eighteen to twenty feet high. This is a good growth, and it seems to have been nearly uniform each season, although the growth of last summer was not equal to that of former years. This is not to be taken as an indication of waning vigor, for it is apparent in the later as well as in the earlier plantations. Catalpa-trees, differing from most others, grow until checked by the frosts of autumn; and the dry season, which last year impeded the growth of Corn, had the same effect on the Catalpa-trees. But while there has been this checking of new growth the ripening has been very thorough, and the wood is in better condition to make a strong growth next year than it was last year, for a close examination showed that the terminal buds then were not so well developed as they are now. This lack of size might have been caused by a frost which suddenly arrested the growth, or by late rains, which excited a growth which did not harden up thoroughly, owing to subsequent cold weather.

In regard to the thinning it is probable that a suggestion made by Mr. Kessler will be tried to some extent. Instead of allowing the trees to fall as they are cut off at the ground, it is proposed that they should be leaned up against another tree with the idea that they will be more out of the way than if dropped on the ground overlapping each other. Perhaps they would be in better position, too, for future removal.

It would probably cost more to cut off the dead branches which remain on the Catalpas than to thin out the wood. Most other trees shed their dead limbs readily, but these Catalpa limbs show no sign of falling off even when they have been dead for five or six years. If the limbs remain sound and the tree makes growth around them, these knots would be no injury to sticks used for fence posts or railroad ties, but if they are to be used for finishing or furniture, the sooner the dead branches are taken off the better. The whole experiment will be watched with great interest, and it

does credit to the men who invested their capital in it. They probably will make a trial of cutting away these dead branches, at least in certain parts of the plantation, in order to arrive at some intelligent idea of the value of such work, and whether or not it is possible to trim the trees with profit. The following is the substance of Mr. Kessler's report :

The Catalpa occupies a larger area in the plantation than any other tree. Of this area *Catalpa speciosa* was the species used wherever the planting was done by Robert Douglas & Sons, and the condition of the trees now proves very conclusively the wisdom of the selection of that species. It seems that the railroad company began the plantation with *Catalpa bignonioides*, and also planted some *Catalpa Kæmpferii*, both of which, as I understand, were bought as *C. speciosa*. Aside from these trees, they planted Black Walnut, Butternut, Pecan, White Ash, Chestnut, Black Cherry, Osage-orange, Ailanthus and Box Elder.

The seedlings of *Catalpa speciosa* (as in fact all the other trees) were planted four by four feet apart, and owing to this close planting they have all made an excellent upright growth. Except on the outside rows along forest-roads or openings the trees are perfectly straight, have few large branches, and all the smaller, and most of the larger, branches that did grow have died out from want of light on the lower part of the trunks to a height of ten feet from the ground. These branches, however, have not fallen off, and few show any indication of decay. Some of the stronger trees are now beginning to overtop the weaker ones, and would, I think, soon thin themselves. However, the difference in growth shown between the trees standing on the forest-roads and those in the interior prove the necessity of hastening the process of thinning out, and this I am having done now.

Catalpa bignonioides does not do as well as *C. speciosa*. It looks rough. Each year's growth shows the struggle between the natural branching habit of the tree and the confining conditions of close planting. The trunks are crooked and often forked. It is quite large in diameter, but only for ten to twelve feet up, and from there seems much reduced in size.

Catalpa Kæmpferi is hardly worth mention as a forest-tree, however valuable it is in park-planting. The trees of this species are about one-half the size of the other Catalpas, very crooked and scrubby.

In the thinning out, some 600 trees are removed from an acre—this means about every fourth tree. This first thinning is entirely a matter of expense, as none of the trees culled are large enough for use in any way, and cannot be disposed of even for fuel, though there is no timber for miles around, because of cheap coal. For this reason the trees are merely cut from the stumps and allowed to fall where cut. At the present rate of work I should say that the thinning will cost not to exceed seventy-five cents per acre.

By way of comparing the results of close and open planting of Catalpa, I noted that some trees on a farm close by, on similar soil and same conditions—trees planted eight feet by eight apart—were one-fifth larger in diameter, from five to eight feet shorter in height, and branched out too much to make straight timber. Whereas the closely planted Catalpas are growing tall and straight enough for some of the future thinnings to furnish excellent telegraph and telephone poles.

The tree covering the next largest area is the Ailanthus. With this the company has had varied success. On rich loam and with a loose or sandy subsoil the trees have grown well, showing good strong trunks and straight, upright growth. Unfortunately, however, these trees do not form sufficiently dense shade to prevent grass and weeds from growing underneath. This means that the sod formed stifles the trees, and they remain stunted. The worst of this, however, is that the weeds and grass furnish food for fires, the only real danger and greatest obstacle to forest-growth on these dry prairies. On the light and thin soil and on places that are taken to have been "buffalo wallows," the Ailanthus makes a growth similar to the Sumach. The best Ailanthus-trees are found where a few were planted isolated among the *Catalpa speciosa*. Here they have kept up with the Catalpa and form fine trunks.

Of the Osage hedge-plants I can only say that they are excellent for hedges. When planted closely, they form bushes instead of trees ; and when the trees do grow, they look small and stunted. None of those on the plantation will exceed three and a half inches in diameter and are about sixteen to eighteen feet high. They will never make trees like those in Texas.

In the mixed planting of Wild Cherry, Black Walnut and White Ash I found a strange condition of growth. The Cherry-trees were planted about sixteen to twenty feet apart in the rows, apparently at haphazard, the space filled with Black Walnut and White Ash, four feet apart. The Cherry stands twenty-five to thirty feet high and six to ten inches in diameter—exceptionally large, fine trees. The Walnut and Ash are only twelve to fifteen high and two to three and a half inches in diameter. Close by, where the Cherries were planted closer together, the trees were much smaller, and the intermediate trees, also Walnut and Ash, have made nearly the same growth as the Cherries. At another point in a mixed planting a few isolated Walnuts seem to have taken the lead, but the Cherries are not far behind, and crowding out the larger number of smaller Walnuts.

Where planted alone the White Ash is making a good, steady growth, and seems to form just enough shade to keep down grass and weeds. In the mixed planting mentioned above the Ash is crowded out to some extent.

The Butternut, Pecan and Walnut do not grow as well here as they usually do when placed in the rich deep loam of creek or river-bottoms. The American Chestnut does no better than the Walnut, and there are only a few left of the small number planted. The Box Elder (Negundo) looks starved, and probably is so, as this tree is usually found only on the bottom-land in moist, shaded places. As its wood is very soft and brittle, it does not appear to me to be of any value as a forest-tree, unless, possibly, as a nurse for other and better kinds.

The best trees of all kinds are naturally found on the deepest loam, but this, strange as it may appear, is nearly always on the high ground.

Correspondence.

The Fruit Interests of California.

To the Editor of Garden and Forest :

Sir.—The State Assessor's report for 1890 makes the total number of fruit-trees in the state 13,180,134. This is a great gain over previous reports. Lassen, Los Angeles, San Francisco and Solano are not represented in this report, and it is unfortunate that the Los Angeles and Solano assessors have failed in their duty, for those two counties are largely devoted to orchard interests. Solano in 1889 reported 669,774 trees, and it is probable that Los Angeles had 1,000,000 trees. This would give a grand total of 14,849,908 for the orchards of California in the summer of 1890. We can safely say that 15,000,000 trees are reported by the township assessors of the fifty-two counties of the state—and not one tree more. Compared with the extravagant estimates and forced statistics of some sensational newspapers, this sober result of the forty years' orchard-work of Californians does not seem large. But every man who knows how great an amount of labor, capital, energy and skill the planting and cultivation of 15,000,000 fruit-trees means, is able to measure the extent of the achievement. Careless writers state with airy grace that 5,000,000 or 10,000,000 trees are planted in a single year in California. The plain statements of the assessors show that considerably less than a million trees are planted in a single year ; but that is a great many.

The total number of acres planted in 1890 to grapes, for table, wine and raisin purposes, was 142,534, according to the assessors' reports from all but twelve counties, only two of which—Los Angeles and Solano—are important in this connection. It is worth while to note relative importance of the several divisions of this industry. The acreage devoted to wine grapes is still greater than that devoted to both raisins and table grapes ; but the area of raisin culture is increasing, and the prospect is that it will soon equal that of the wine grapes. The present order of supremacy in table grapes is, Tulare first, Placer second ; in wine grapes, Sonoma first, Napa second, Santa Clara third ; in raisin grapes, Fresno first, San Diego second.

These brief notes from the latest statistical reports of the state of California help to prove what many of us have learned, through painful experiences, that floating newspaper items about horticultural subjects are not always reliable.

Niles, Cal. *Charles Howard Shinn.*

Flowers and the Perfume Industry.

To the Editor of Garden and Forest :

Sir.—In your issue for January 14th I find the above heading, and I have thought it would interest your readers to know that for over six years efforts have been made by myself and many other southern women to learn how flower pomades are made in southern France, for we believe our climate and soil perfectly suited to this industry. Our lack of success comes, we believe, entirely from not knowing by what process the fat is deodor-

ized and clarified, and this process none of us have yet succeeded in obtaining from the manufacturers. The grease must be so clarified that rancidity is impossible. I have corresponded with Mr. George Keene, Mrs. Antoinette Wakeman, Colgate & Co. and others, but as yet we are still uncertain as to the process. In Piesse's "Art of Perfumery" a recipe is given, but, although followed closely, failure resulted. About three months ago I received a letter from a resident of California, in which it was stated that an experiment with raw or uncooked leaf-lard had resulted in success. If true, it would open up another industry to our southern states, where the Jasmine, Violet, Tuberose and Acacia are all hardy and grow in prodigal profusion. Success in one instance came near crowning the efforts of Miss Ida Nowell, of Georgia, who used the Cape Jasmine (Gardenia) for her experiment. The pomade was submitted to Colgate & Co., who, after it was tested, offered her a contract to make from 100 to 200 pounds of the pomade at $1.50 a pound. This pomade sent to the Messrs. Colgate & Co. as a sample was made into an "Extract of Gardenia," which, after being returned to me, I turned over to Freeman, perfumer, who kindly exhibited it at the Cincinnati Exposition in 1887. It was such a small bottle, not holding over one-eighth of a gill, that it must have been lost, as it was never returned to me.

I am one of the managers of the Columbian Fair for South Carolina, and even to-day I have been busily writing to different persons urging the desirability of a renewed effort to discover the secret of the preparation of the pomade. There was imported into the United States in 1890 $3,000,000 worth of these flower pomades alone. I am now negotiating for the purchase of a copper still in which I hope to distill the oil of Rose Geranium, which is used by unscrupulous dealers to adulterate attar of rose.

Spartanburg, S. C. *J. S. R. Thomson.*

[In an article in another column some of the questions raised by Mrs. Thomson are discussed and the general method of preparing the fat for pomade is indicated. We should be greatly obliged if any reader who is familiar with the processes of preparing marketable perfume would forward specific directions. It should be remembered, however, that, like any other manufacturing business, this must be learned by experience, and it can only be prosecuted with profit with skilled labor and the most approved appliances, so that uniform excellence can be secured by the most economical methods.—Ed.]

Periodical Literature.

One subject treated of in the latest bulletin of the Cornell Experiment Station is the crossing of plants of the Squash-family, and the experiments recorded seem to demonstrate the fallacy of many popular beliefs. It is pretty widely believed that the different species of cucurbitaceous plants intermingle readily and hybridize freely, so that almost any story about the crossing of these plants will find believers. Professor Bailey began experiments in crossing those plants three years ago, and has continued them on a large scale ever since. After having made more than a thousand careful pollinations by hand, Professor Bailey asserts that there is no immediate effect of crossing Pumpkins and Squashes—that is, the effects of the cross are not seen in the fruits of the first year, but only in the offspring of the seed. Of course, ordinary experience would lead to the same conclusion; for if there were any immediate effect we should always look for different kinds of fruits on the same vine, while, as a matter of fact, the squashes or pumpkins on any vine are always alike, with such exceptions as are due to arrested development or some other immediate cause.

There is a prevailing belief that Pumpkins and Squashes cross indiscriminately, but, in studying the question, Professor Bailey divided the fruits called squashes into two groups, one including the summer and fall squashes, like the Scallop, Crook Necks, Bergen and the like, which belong to the same species as the field pumpkin—*Cucurbita Pepo*. These squashes cross with each other and with the field pumpkin, although the mixture is not indiscriminate. The Hubbard, Turbans and so-called Mammoth squashes and pumpkins, like the Mammoth Chili, belong to another species—*Cucurbita maxima*. After many careful pollinations between these two classes of fruits seeds were not produced in any case, and all the experiments show that these different species will not hybridize. In large collections of summer pumpkins and squashes fruits which might be taken for hybrids with the Turban class may be found, but they are nothing more than incidental variations of *Cucurbita Pepo*.

In Pumpkins and Squashes the flowers are either wholly staminate or wholly pistillate, and therefore they cannot be self-fertilized. The two kinds of flowers, however, are borne on the same plant. A great number of trials were made in which the pollen from a staminate flower was used upon a pistillate flower of the same plant, but in every case the seeds were thin and worthless. In cross-pollinations, that is when the pollen from the flowers of one plant were applied to female flowers of another plant, a large part of the trials were successful, which indicates the impotency of pollen to fertilize a flower produced on the same plant. Pollen of Squash-flowers, however, which cannot produce fertile seeds, may still cause the development of the fruit. This influence of pollen is well attested in other instances, and it is not impossible that squashes may sometimes develop without any pollination whatever. It is the common belief that the best way to render new varieties permanent—that is, to fix them so that they will reproduce themselves from seed—is to inbreed them to establish their ancestral qualities; but the above trials seem to prove that close pollination is practically impossible in the case of the Pumpkin and the Squash.

It is generally accepted among gardeners that musk melons are rendered insipid when cucumbers grow near them. Some growers suppose this influence is immediate, but others hold that it appears only in the offspring of supposed crosses between the two species. Last summer ninety-seven Musk Melon flowers of various varieties were pollinated with Cucumber pollen of many kinds, but not a fruit developed. Twenty-five Cucumber flowers were pollinated by Musk Melon pollen; one fruit developed, and that was seedless. These trials indicate that the two species do not cross and that the influence of one upon the other is imaginary.

An examination of the flowers on Musk Melons, Water Melons and Cucumbers show that from six to twenty-four times as many staminate as pistillate flowers are produced. The pistillate flowers appear later in the season, five days in the case of the Cucumber to thirty days in the case of one Musk Melon-plant. The staminate flowers continue to appear later than the fertile ones. This fact justifies the common observation that the Cucumber is more precocious than the Melon, and enforces the necessity of starting Melons early in short seasons.

The most interesting paper to the general reader in the January *Bulletin of Miscellaneous Information* issued from the Royal Gardens at Kew doubtless is the one which relates to the origin of the ginger which comes to us from China in earthenware jars of more or less artistic merit. Professor Wright, of the University of Dublin, several years ago pointed out the fact that the "large, flat, finger-like masses sent from China as preserved ginger" were different from anything that the ordinary Ginger-plant (*Zinziber officinale*) could possibly produce. The question then arose, What was the plant that supplied the preserved ginger of commerce? The common Ginger-plant, as is the case with many cultivated plants, is not known in the wild state. It is believed, however, to be a native of Asia, and was known to the Greeks and Romans, who received it by way of the Red Sea, and believed that it came from southern Arabia.

The Ginger-plant was introduced into the West Indies, from which it was shipped commercially to Europe as early as the sixteenth century, it is said; and the dried ginger of commerce is now almost entirely derived from the West Indies, from Senegambia, from Egypt and India. None apparently is produced in China. The long correspondence which the authorities of Kew have carried on with regard to the origin of Chinese ginger, and their experiments in cultivating various plants sent from China, for the purpose of determining the source of the preserved ginger, leads at last to the conclusion that it is produced by *Alpinia galanga*, and the specimens, curiously enough, which enabled this determination to be made, did not come from China, but from the Botanical Department at Jamaica, where Alpinia has long been grown. Probably one or two species of the same genus also produced edible ginger in Siam and other countries of tropical Asia.

The other papers in this issue are on west *African Bass Fibre* and on the *Production of Seed and Seminal Variation in the Sugar-cane*. The fact lately discovered that the Sugar-cane, which from time immemorial has been propagated by buds, sometimes produces seeds, is a matter of considerable agricultural importance as suggestive of the possibility of producing improved seedling varieties.

Notes.

It is said that in north-western Persia and in eastern Afghanistan the bulbs of a species of Tulip (*Tulipa montana*) are largely used as food. They may also be found in the markets of Bombay, where they are called "Salep."

The patience characteristic of modern students of plant-life is well exemplified by the fact that Herman Mueller, when studying the cross-fertilization of flowers, recorded ten thousand instances, observed by himself, where insects had visited flowers in such a manner as to carry the pollen from one to another.

According to *Gartenflora* the district of Reutlingen, in Germany, had, in the year 1885, an income equal to about $65,000 from the fruit-trees planted along its highways. In the district of Monheim the fruit-trees on the public roads, which had been planted in 1858, yielded in 1868 a revenue of some $1,850, in 1878 $4,250, and in 1885 nearly $7,000.

In a recent issue of the *Official Gazette* of Montenegro, Prince Ferdinand ordered that every military man in active service should, during the year, plant a given number of Grape-vines, the number varying according to his rank. Each guide, furthermore, is to plant two Olive-trees, and each corporal one; and the *Gazette* calculates that by this means 4,000,000 Vines and 20,000 Olive-trees will have been set out by January, 1892.

A monument is to be erected in France to Jean Nicot, who introduced the Tobacco-plant into that country, and whose name it since has borne. In the year 1560, when ambassador at the Court of Portugal, he sent a package of seed to the French queen, Catherine de Medici. Sixty years later the first tobacco tax was imposed by Cardinal Richelieu, and not long afterward the revenue from this source amounted to some $50,000, while in 1718 the tax was "farmed" to a collector for an annual sum of $3,200,000.

Writing of Japan in the *American Garden*, Professor Georgeson says: "The total area of the main islands is 112,000 square miles, but of this total 68,000 square miles are entirely unproductive mountain and desert lands, and 24,000 square miles more are in forests and uncultivated agricultural lands. . . . The remaining 20,000 square miles contain the 40,000,000 inhabitants of the country, which thus gives an average of 2,000 people to the square mile. Kansas contains 81,000 square miles. If her people could live as the Japanese do, she could sustain 40,000,000 souls, and still leave three-quarters of her territory a wilderness!"

The Tea-industry of China is very much demoralized by the increase of Tea-production in other countries, especially in India, and great distress prevails in many of the Tea-districts. We learn from a recent issue of the *Fouchow Echo* that the authorities are advising the owners of Tea-gardens to destroy their Tea-plants and replace them with Rice or Potatoes. This advice is being adopted wherever a supply of water can be obtained for irrigating the Rice-fields. The cultivation of opium is also increasing in some parts of China, in the place of Tea-plant. But thousands of families, it is said, who were formerly supported by cultivating Tea-gardens are now ruined.

The danger from damage to forests by fire where lumbering is carried on, arises largely from the fact that the tops of the trees and large limbs which are left on the ground dry rapidly and give fuel for any running fire to catch in. The burning of these leavings is an expensive matter, and it is suggested by Mr. Fernow, in his Adirondack report, that the branches might be lopped, so that both they and the tops would fall to the ground. In this way the tops, which are ordinarily braced up from the ground by the branches and kept as dry as tinder, would be likely to be kept moist from snow and rain and rot sooner. A trial of this method would be an interesting experiment. To answer the purpose most completely, the lopping should be done as soon after the felling as possible.

A correspondent inquires if the Strawsonizer is a machine for throwing poison spray as an insecticide. It is that, and it is more. It is a machine which may be adapted to many uses, such as the sowing of grains, the distributing of fertilizers and of dry or liquid insecticides by a blast of air produced by a revolving fan, worked by the traveling wheels of the machine. It is said that rapid and even work in broadcasting grain is done with this machine, and that the grain is scattered with great regularity over a track from eighteen to twenty feet wide, and it is equally good as a distributer of fertilizers and poison-powder for insects. There are some machines worked by hand-power, and larger ones by horse-power. The machine is more fully described in the issue of *Insect Life* for January in the article by Profesor Riley in the "Outlook for Applied Entomology."

It seems doubly fortunate now that the prehistoric "Serpent Mound" in Ohio should have been preserved against all the dangers man's agency might work by the establishment of a public park to contain it, for we are told that another famous work of the same kind, "Monk's Mound," is to be destroyed, that its materials may be used to fill in certain low-lying portions of East St. Louis. It was described by Charles Dickens in his "American Notes," and is said to cover an area of thirty acres, its peak rising nearly a hundred feet above the level of the surrounding country. "On the apex," says the New York *Times*, "there was a dwelling at one time, and a few years ago an extensive Peach-orchard flourished on the southern slope. Nearer the base, on the opposite side, field products and garden truck were cultivated—the soil yielding bountiful crops."

In commenting upon the statement that three successive Dukes of Athol had planted altogether 14,000,000 Larch-trees on their estate in Scotland, *Galignani's Messenger* recently remarked that it had been doubted from the apparent belief that it implied that the noble owners had set out the trees with their own hands. Such, of course, was not the fact, "but," adds the *Messenger*, "if it comes to planting trees with one's own hands there is still something to be said" for royal and noble personages. With his own hands "Charles II. planted nearly all the trees in the avenue at Windsor . . . . and some that are now in St. James' Park; and George III. had a mania for planting his own trees as well as innumerable Grape-vines. Her present Majesty has planted over 5,000 trees in various places she has visited, and the Prince of Wales cannot be very far behind her in so doing."

The *Journal of the Society of Arts* (England) recently said: "A memorandum, together with a sample of the plant, lately received from Sir Alfred Moloney, K.C.M.G., the Governor of Lagos, gives an account of the endeavor he is making to encourage the exportation of the fibre known as African Bass, the fibre of the Bamboo Palm or *Raphia vinifera*. The Bamboo Palm or *Raphia vinifera* is perhaps the commonest tree in the swamps and lowlands which line the waterways of the colony. Dense thickets of these Palms, traversed only by the palm-wine gatherer or the bamboo-cutter, push their way into the lagoons, and extend over the flood grounds, and even to a distance of from fifteen to twenty miles up the river valleys into the interior. The area occupied by the Raphia-forests it would be impossible to calculate, but it may be accepted without doubt that they extend throughout the length of the colony, and to a distance of at least fifeen miles from the sea-coast, and that over this area of about 5,000 square miles they form a considerable proportion of the vegetation; next only in numbers to the Oil Palm (*Elæis Guineensis*) and the Mangrove (*Rhizophora mucronata*). The fibre itself is the one in most common employment on the coast, being used by the natives for all sorts of purposes—cloth, cordage, thatch, fishing-lines, etc. The cost is only that of collection and preparation, the latter being a very simple process of soaking and scraping. The price, delivered in England, is said to be £30 to £32 per ton for good fibre. The cost of production is estimated at £14 per ton, shipping and other expenses at £4 10s. The samples are now on view at the Society's house, and can be inspected by anybody desirous of doing so."

Catalogues Received.

Bush & Meissner, Bushberg, Mo.; American Grape Vines.—H. Cannell & Sons, Swanley, Kent, England; Vegetable and Flower Seeds; Illustrated Floral Guide.—Chadborn & Coldwell Mfg. Co., Newburgh, N. Y.; Lawn Mowers.—Cold Spring Seed Farm, Big Horn City, Wyoming; The Buffalo Berry and Native Wild Fruits of Wyoming.—D. M. Ferry & Co., Detroit, Mich.; Vegetable and Flower Seeds.—Peter Henderson & Co., 35 and 37 Cortlandt Street, New York, N. Y.; Ornamental Plants, Flower and Vegetable Seeds; Everything for the Garden.—McMath Bros., Onley, Accomack County, Va.; Vegetable Seeds; Small Fruits and Vegetable Plants.—Rea Brothers, Norwood, Mass.; Hardy Plants.—E. W. Reid, Bridgeport, O.; Vegetable Seeds, Fruits and Small Fruits.—Selover & Atwood, Geneva, N. Y.; Ornamental and Fruit Trees, Bulbs, Shrubs, etc.—J. C. Vaughan, 146 and 148 West Washington Street, Chicago, Ill.; Vegetable and Flower Seeds, Small Fruits.—Vilmorin-Andrieux & Cie., Quai de la Mègesserie No. 4, Paris, France; Flower and Vegetable Seeds.

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The True Function of City Parks.

THE *Atlantic Monthly* for February contains an article by Mr. Alpheus Hyatt entitled "The Next Stage in the Development of Public Parks." What is interesting and valuable in this paper is a plea for the establishment in cities of more museums and a sketch of the principles on which collections should be made and arranged so as to serve the highest practical purpose. Mr. Hyatt urges that at our present stage of civilization collections of the varied forms of animal and vegetable life are as necessary as are public libraries and universities. We have learned that the highest education in the natural sciences is not acquired from books—that is, by a study of what other people have recorded—but by original investigation of the objects themselves; and public museums and gardens could aid in this direction by supplying natural objects for the use both of teachers and pupils just as libraries furnish books for those who wish to read. A museum, according to this view, is not a place of amusement merely—a collection of natural curiosities or rarities to excite the wonder of the ignorant—but a source of constant and adequate supply of objects for investigation by persons who are engaged in serious study. A zoölogical garden should not be a menagerie for the sole display of animals which are large or strange, but should include creatures of humbler structure, creatures which are small indeed, but whose functions in the economy of nature are of the highest importance to man and his physical surroundings. This means that we should have insectaries, where the various transformations of insect life could be observed; aquaria for the exhibition of marine animals and plants and sea birds, and fresh water aquaria for the fish and other inhabitants of inland lakes and rivers, together with such plants as grow in or near the water.

Of special significance are Mr. Hyatt's ideas with regard to grouping the animals in zoölogical collections according to the laws of geographical distribution as well as to those of specific relationship, and of supplying "a proper representation of the flora of each great area or country in the shape of some characteristic trees and flowers," in order to furnish the animals with appropriate surroundings "and give scientific and artistic completeness to these illustrations of the fauna." But, perhaps, the most novel of his suggestions is that, in addition to objects of study, teachers should be provided, who would do more than a printed guide-book in pointing out and naming and describing the interesting forms in any collection. No catalogue can ever keep pace with living and growing collections, and its pages are never large enough to answer the inquiries which every visitor is eager to make. Mr. Hyatt, therefore, would substitute for the catalogue educated men, who would be present not only to satisfy all reasonable curiosity, but to awaken interest, and, at the same time, give instruction that would be of permanent benefit.

All this is very attractive, and not impracticable. But when Mr. Hyatt declares that a public park does not fulfill its highest mission until it develops into a vast and multiform museum for popular instruction, he plainly ignores the specific purpose for which pleasure-grounds like Central Park, for example, have been created. Indeed, one may read Mr. Hyatt's article attentively and fail to discover whether he has ever cared to inform himself precisely what that purpose is. The fact is that in popular language there is no well-defined group of ideas suggested by the word park, and it is applied to areas of ground which are used for the most varied and incongruous purposes. To one man it may mean a base-ball field; to another a military parade-ground; to a third a place where racehorses are used to facilitate gambling. Indeed, the danger of assaults upon the integrity of city parks is constant because of the lack of clear popular conception of their true functions, and they never will be safe from attacks until their primary purpose is universally understood, and until this purpose is admitted to be of sufficient importance to justify their existence and maintenance.

We have some hesitation about stating elementary principles with which our readers are already familiar, but there seems to be need of repeating pretty frequently that a park, such as is now under consideration, should be primarily and essentially a rural retreat—a place which will enable the people of a city to visit the country without leaving the town—and that its highest purpose is not to furnish instruction nor pure air nor a place for exercise on foot or on horseback, but to furnish that relief and repose of mind which natural scenery brings to those who are wearied by city sights and sounds. We need not inquire why this is so, but the fact is universally known and recognized that rural scenery has an intrinsic value in enabling us to resist successfully the wearing influences of town life and to recover the mental energy thus wasted. Every one is more or less susceptible to the charms of scenery, and a city park has a greater or less value for a city population, according to the degree in which this poetic charm of scenery is preserved and developed. Of course, a park designed and constructed with such a leading motive will not fail to furnish pure air and a field for exercise and opportunity for study, while if it is designed primarily with reference to any of these subordinate uses its highest purpose will not be reached.

It is true that the highest authorities on these subjects have made in some parks provision for boating, for tennis, for skating, for music, for children's playhouses and the like, but wherever such introductions have been successful they have been incidental and subordinate to the controlling motive of the park which has been steadily kept in view. A botanical garden, a zoölogical garden or an aquarium might well be placed in grounds adjoining a park, but separated from it so as to avoid any tendency to combine the ideas of a park and a museum, for the object of a museum and the object of a park are utterly distinct, and it is no more possible for a park to develop into a museum than it is for a library to develop into a cathedral.

Unless we hold fast to these primary truths our parks may be changed into places for miscellaneous out-door sport and recreation; they may afford the advantages of speed-roads for the owners of fast horses or spacious promenades where fashion may display its bravery and equipage, or, in accordance with Mr. Hyatt's idea, they may be "placed in correlation with the educational systems" of our cities by offering a home for thronging colonies of vertebrate and invertebrate animals besides vast collections of stuffed and dried curiosities, with all their vegetation ticketed and labeled, and trained lecturers discoursing on biology at convenient intervals. Public grounds prepared on any of these plans would no doubt be of great value to any city, but they would not be parks, nor serve the use of parks. Neither recreation, in the specific sense of amusement, nor education, even under its most attractive guise, but refreshment, pure and simple, for body and mind is the primary office of the public park. And nowhere should this fact be insisted upon more strenuously than in eager American communities where there is little inclination to give either mind or body their needed quota of peaceful, unambitious hours.

Recent Botanical Discoveries in China and Eastern Burma.—III.

Herbaceous Plants.—The herbaceous element in General Collett's collection of plants from the southern Shan Hills is not less interesting botanically than the shrubs and trees, and there are many novelties sufficiently ornamental to engage the attention of the horticulturist, and a few are exceptionally beautiful or singular plants. Taking them in systematic order, the first demanding notice is a species of Balsam (*Impatiens ecalcarata*), a species so strongly resembling the pretty *Impatiens Chinensis* as to be taken for it at the first glance; but, as the specific name denotes, the flowers are spurless. With this exception, it is so like the species named, in the dried state, at least, as to suggest its being a morphological variation of it. Yet among the very numerous specimens in the Kew Herbarium we detected none in which the spur was wanting or modified. It is a slender, almost unbranched, annual, a foot to two feet high, with narrow, opposite, more or less toothed leaves, whitish beneath, and solitary, axillary flowers on slender stalks. The color is not stated, but they are probably white or rose. *Impatiens Chinensis* itself deserves a word in this place, as it is certainly a most elegant plant, the flowers varying in the wild state from deep purple to a soft rose, and there is also a white variety. Although introduced into English gardens as long ago as 1824 it is now rarely seen. *Impatiens fasciculata* (*Botanical Magazine, t.* 4631) is a pale variety of this species, and *I. setacea* (Hooker's "Exotic Flora," *t.* 137) is another variety, having beautiful rose-purple flowers.

The herbaceous *Leguminosæ* from the Shan Hills offer little that is specially interesting from a purely horticultural standpoint, though there are several remarkable novelties. *Crotalaria perpusilla* is a miniature representative of its genus; *Neocollettia gracilis* is a singular creeping plant with minute flowers, belonging to a small group having one-seeded pods; and *Phylacium majus* is a fine new species of a previously monotypic genus from the Malay archipelago.

The herbaceous *Compositæ*, again, are few of them ornamental. *Inula crassifolia* is one of the most striking, having thick, almost fleshy, leaves, and large yellow flower-heads. This plant was collected in two very different conditions, though all the specimens were in the same stage of development. In one set they are thickly clothed with long, spreading hairs; in another set they are quite glabrous, so that at first sight they would be taken for distinct species, but the plants are probably all hairy at first, and the hairs early deciduous.

Notonia crassissima is a shrubby member of this order which I omitted to mention before. It has thick fleshy branches, resembling some of the Euphorbias, such as *E. neriifolia*, and long-stalked, showy yellow flower-heads, and it grows erect or trails over rocks.

About half a dozen different *Campanulaceæ* were collected, including several very pretty things, notably the elegant little twiner *Codonopsis convolvulacea*, previously only known from the contiguous province of Yun-nan, in China. General Collett describes it as common all over the plateau, creeping among grasses and twining around their culms until it reaches air and sunlight, when it produces its beautiful, dark blue, Convolvulus-like flowers. One species of the highly ornamental, mainly east Asiatic, genus Adenophora was collected. It is also common in the Khasya Mountains, but had not hitherto been referred to this genus.

Primula Forbesii is a pretty species, originally and recently described by Mr. Franchet from Yun-nan specimens. With one or two other Chinese species, it forms a new section of the genus of annual duration, and intermediate in character between Primula and Androsace. It is a very floriferous plant, with an almost flat rosette of thin leaves and very slender, erect scape, bearing from one to three or more tiers of small flowers similar to those of the Himalayan *P. floribunda*. It grows abundantly in almost all damp localities throughout the Shan States, being equally at home in the shady depths of the forest and in the ridges raised to divide irrigated rice-fields; and it was found in flower in some situation or other in every month of the year.

Among Asclepiads, a very dwarf, tuberous-rooted Ceropegia deserves notice. The flower-stems rise only four or five inches above the ground, while the curiously constructed flowers are themselves two inches long. *Brachystelma edulis* is an allied plant of even smaller dimensions with small rotate flowers. It is common on the sandy plains of Upper Burma, and its fleshy tubers are collected and sold in the bazaars as an article of food; but their flavor is not agreeable to a European palate.

There are two new species of the section Ophelia of Swertia, neither more nor less pretty than most of those previously described of this elegant genus.

Specially conspicuous and beautiful among the herbaceous plants on the uplands are various *Convolvulaceæ*, especially the genus Ipomæa, of which sixteen species were collected, including two very ornamental new ones. *Ipomæa nana* is a dwarf species almost concealed by the grasses among which it usually grows. From the woody root-stocks spring erect stems from six inches to a foot high, bearing very hairy, undivided leaves, and large, axillary, solitary flowers of a rich deep purple. *Ipomæa Popahensis*, the other new species, has very similar flowers and foliage, but it has weak stems that twine around grasses and other plants. It inhabits the isolated Mount Popah, which rises to an altitude of 5,000 feet in the plain of Upper Burma.

There is nothing ornamental among the herbaceous *Scrophularineæ*, and the solitary new Gesnerad has inconspicuous flowers. *Acanthaceæ* are more numerous, and some of them very pretty, notably among the new ones *Strobilanthes connatus*, found in great abundance in the dry forest-tract at 2,000 feet. The *Labiatæ* are numerously represented, and many of them are ornamental, but all of them were previously known. Prominent among them are *Orthosiphon staminens*, *Colebrookia oppositifolia*, *Leucoscephum canum*, and various species of Plectranthus, Elsholtzia, Scutellaria and Coleus. But the most ornamental of all is the previously little known *Colquhounia elegans*, which General Collett specially signalizes as worthy of cultivation. It is an erect shrub, eight to ten feet high, with ample foliage and dense axillary clusters of showy flowers in the way of a Leonurus. As a species it is near *C. coccinea*, figured in the *Botanical Magazine* (*t.* 4514). Two varieties were collected, one having dark red and the other salmon-colored flowers. A second and almost equally beautiful species, *C. vestita*, was less common, though it inhabits the mountains of northern India from Assam westward to Kumaon. Orchids were not numerous, only twenty-two species having been collected, though of these five are accounted new, and two of these are exceedingly distinct, curious and beautiful. A word first respecting the old ones, which included *Dendrobium lituiflorum*, *D. infundibulum*, *D. fimbriatum*, *D. capillipes* and *D. heterocarpum*, better known as *D. aureum*. Also among them were *Vanda cærulescens* and *Cypripedium concolor*, var. *Godefroyæ*.

The gem of the whole collection, perhaps, including the big Rose and the big Honeysuckle, is an Orchid, which I have named after its discoverer. It is *Cirrhopetalum Collettii*, the finest species of the genus, and most nearly allied to *C. ornatissimum*, figured in Warner's "Orchid Album," plate 369, but having dark purple flowers, with exceedingly slender lateral sepals about five inches long. These long, tail-like sepals are wafted about by the slightest breath of air. But, what is more curious, the comparatively small upper sepal and the two lateral petals are furnished on their margins with small, extremely delicate, highly mobile appendages resembling tiny banners and streamlets, which "wriggle about in a very odd manner." Amateurs will be glad to know that there is a good healthy plant of this attractive novelty growing at Kew.

The only other new Orchid I have to mention is *Bulbophyllum comosum*, which has a bottle-brush-like inflorescence of

small, pleasantly fragrant flowers borne on a slender scape. It is nearest *B. hirtum*, but neither the pseudo-bulbs nor the leaves are known. The plant was common, and the flowers, which are highly prized by the Shan maidens for ornamenting their hair, were sold in the bazaars, so that General Collett thought it must be known in Europe and was satisfied with bringing away two or three inflorescences.

A new Lily (*Lilium Bakerianum*) may close my remarks on this collection. It is intermediate in character between *L. Dahuricum* and *L. Japonicum*.

Doubtless, a country so rich in ornamental novelties as the Shan States will soon be explored by the collectors of some of our nurserymen.

Kew. *W. Botting Hemsley.*

The Chollas.

ONE of the most characteristic features in the landscape of southern California, especially in the region of the coast, is the extensive, impenetrable thickets of a cylindrical species of Cactus, familiar to all under the Mexican name, *Chollas*. The common Cholla in the vicinity of San Diego is *Opuntia prolifera*, Engelm., which grows abundantly on arid hills or mesas, especially on precipitous cañon-slopes bordering the usually dry water-courses. Chollas Valley, within the limits of the city of San Diego, received its name from the abundance of this plant. It grows from three to eight or ten feet in height, the stems from two to four, rarely six or seven, inches in diameter, and at the base forming a woody stem or trunk a foot or more in diameter.

The plant has never been utilized by stockmen for forage to my knowledge, as has been the case with some species of the genus, and it is quite a formidable task to clear land of this obnoxious plant. The short, stout spines are especially painful and tenacious after they have entered the flesh, and strangers in our land, human and brute, soon learn to give it a wide berth.

The flowers are an inch and a half in diameter, of a pretty wine or pomegranate purple, but are so well guarded by a multitude of formidable spines as to almost repel admiration. The fruit is proliferous, the seed almost invariably abortive.

Professor E. L. Greene records it from the Coronado and Guadalupe Islands, while T. S. Brandegee reports it from the Santa Catalina Island and as far southward as San Ignacio, in Lower California, where, he says, "the plants are sometimes almost spineless." I have not found it south of Todos Santos Bay, Lower California, but to the southward a very similar Cactus appears, identical in appearance, but very distinct in its fruit. I am, therefore, inclined to doubt whether the species which Mr. Brandegee reports or Professor Greene's Guadalupe Island plant, which he says is "smaller than in California," is the same as our San Diego species. The fruit is fleshy, spinous, very rarely containing even a single seed. The perfect seed is much larger than in the above-mentioned Mexican species.

Opuntia serpentina, Engelm., is a slenderer, usually prostrate, species, not gregarious nor so abundant as *O. prolifera*, producing yellowish green, purple-tinged flowers, followed by a dry many-seeded fruit, broadly umblicated and very spiny. The stems of this plant are seldom more than three or four feet long, an inch or two in diameter, and less woody in structure than the last species.

On the Colorado desert and eastward and southward through Arizona and New Mexico into old Mexico, the species and varieties of Chollas seem almost endless in number. The Indians in the mountains of San Diego County and in northern Lower California formerly planted them above the graves of their dead, and often a valley may be found dotted over with little groups of a slender, erect species (probably *O. Bernardina*, Engelm., ined.) planted by their hands.

One species (*O. Bigelovii*, Engelm.) has been sparingly utilized as fodder for cattle, after the spines had been burnt off, but all the species are very generally detested by all who are brought into intimate relations with them.

San Diego, Cal. *C. R. Orcutt.*

An Insect Pest of Cattleyas.

(*Isosoma orchidearum.*)

THIS insect does not appear as yet to have become common or generally known among collections in this country, and it is well that growers should be on their guard against it, because it seems to have become quite common in Europe, and is therefore liable to be introduced with any fresh importation of the plants.

The pest has appeared in more than one locality and in past years has not been unknown even in such carefully guarded collections as those of Mr. Ames, at North Easton, Massachusetts. A notice of its occurrence in another collection appears in *Insect Life*, vol. ii. (1890).

About two years ago, Dr. C. G. Weld, of Brookline, Massachusetts, imported a lot of Cattleyas from England which at first appeared to start into good healthy growth, but soon proved to be badly infested by this so-called "orchid-fly." The young buds or pseudo-bulbs which would eventually produce the flowering-spikes were noticed to become checked in their development, and upon cutting them open numerous little maggots or larvæ were found in cavities which they had eaten. Some pupæ were also found, and these, together with a few of the larvæ, afterward developed into small, black, four-winged flies.

From an investigation of the history of this insect it would appear that it was first publicly referred to by Professor J. O. Westwood at the meeting of the Royal Horticultural Society of February 16th, 1869, and a brief mention of the fact was given on page 196 of the *Gardeners' Chronicle* for the same year. On page 1230 of the same volume (1869) Professor Westwood gave a slight sketch and a brief notice of the insect, for which he proposed the name of *Isosoma orchidearum*. It is more fully figured and is technically described by the same author in the *Transactions of the Entomological Society of London* for 1882, pp. 322–324, pl. xiii.; and occasional brief notices of the pest have appeared in various foreign journals.

The perfect insect or fly is black, and has clear, shining, iridescent wings. The female is about one-seventh of an inch long, while the male is considerably smaller, being only about one-tenth of an inch in length. The head and thorax are rough and unpolished, the microscope showing them to be covered with tiny pits, from each of which little bristles or hairs project. The abdomen is black, smooth, polished and shining, and is without hairs except on the smaller last segments. The abdomen of the female is pointed and somewhat wedge-shaped beneath, while that of the male is small, being not more than half the length of the female abdomen and terminating bluntly or abruptly. Under the microscope the sexes may be readily separated by the antennæ. In the female most of the joints are about of the same size and shape, being symmetrical and connected together by inconspicuous pedicels; while the male antennæ are somewhat longer, the chief joints being longer and abruptly tapering to a slender neck or pedicel at the anterior ends, and lacking symmetry by being much more swollen on one side than on the other. The whorls of hairs or bristles are very much longer than on female antennæ.

It may be also worth noting that, counting the less distinct articulation in the terminal joints, the antennæ of the females are apparently ten-jointed, while in the males only nine divisions are noticeable.

The legs at the joints are red; the femora or thighs black; the tibiæ or middle portion yellowish or reddish, except on the hind pair, where they are blackish, and the feet (tarsi) are pale or dull white and tipped with minute dark claws. From the specimens collected the females appeared to greatly outnumber the males.

The female is provided with a long and extremely slender ovipositor, which it inserts into the tissue of the plant when depositing its eggs. When not in use, this ovipositor lies quite concealed by a groove and protecting sheaths, and only very careful manipulation with a slender-pointed instrument will bring it into view. In the figure the ovipositor and free portion of the sheaths are shown removed from their closely fitting position along the under side of the body.

The little footless grubs or maggots are white, and a sixth of an inch or less in length when fully grown.

Several of them may be found together, and they change to pupæ, and eventually to the winged state, within the cavity they have made in the Orchid, out of which they emerge through a small round hole in the side. Owing to their small size the flies are not easily detected after they escape, but they have been found resting on the under side of the leaves of the plants.

If this insect once gets a foothold in a collection it becomes a difficult one to exterminate. No means of trapping the flies are known, and the only apparent remedy has been the heroic one of cutting off and destroying all portions of the plants suspected of being infested. The young pseudo-bulbs usually become somewhat abnormally swollen if the maggots are at work within, although the indication is not always a certain one. To cut these young shoots off means the loss of flowers for a year.

It has been suggested that the larvæ could be killed in their burrows by prodding the infested shoots with a triangular dis-

secting pin (*Bull.*, p. 23; *Ann. Soc. Ent. de France*, 1888), and it seems that such experiments have been made in Paris, although the final results do not appear to have been published. Instead of making the numerous punctures which would be necessary in order to destroy all the larvæ, it might be worth while to try some experiments with insecticides. A drop of strong tobacco decoction, or of some oil, injected through a perforation, would destroy the insects reached; but the experiment should be carefully watched, both as to its effect on the plants and insects. Fumigating has been practiced in attempts to destroy the flies, but it is questionable whether fumes strong enough to kill these insects would not also injure the plants.

To keep a collection free from the pests every new importation should be thoroughly examined, and, if not known to be from uninfected establishments, they should be quarantined in a separate house for at least a year before placing them with unaffected plants.

The full history of this insect is not yet thoroughly known, and it is not at all certain that it does not live in other parts of the plants besides the new shoots or pseudo-bulbs. Similar-looking, and probably identical pupæ have been found singly in cavities in the fleshy leaves, the spot being indicated by its lighter color and a slight swelling on each side. It has also been reported that the insect makes pea-shaped swellings on the roots, but it has not been proved that this is the work of the same species.

Isosoma orchidearum, figured on page 103 from drawings by Mr. C. E. Faxon, was probably first imported into England with Cattleyas from South America. To the entomologist the insect is interesting, from the fact that it belongs to a group which was long considered to be purely parasitic upon other insects. It seems that a few European entomologists still maintain this theory; but the studies of Harris, Fitch, Walsh, Riley and others on the Isosomas of the wheat and other grasses in this country have clearly shown that insects of this genus, in many cases at least, subsist entirely on vegetable food and that they are capable of doing much injury to cultivated crops.

Arnold Arboretum. *J. G. Jack.*

Notes on North American Trees.—XXIV.

57. *Hypelate trifoliata.*—This small West Indian and Floridian tree has been known for nearly two hundred years, having been discovered in Jamaica by Sir Hans Sloane, who published an account of it in 1696 in his Catalogue of Jamaica Plants; and all subsequent writers on the flora of the Antilles have described it more or less accurately. The best account which has been published is found in Lunan's *Hortus Jamaicensis* (i., 387), where the structure of the seed is hinted at. Hypelate produces male and female flowers in separate panicles on the same plant, the males probably predominating, as fruit is rarely produced; and the seed has never been described in the two centuries this tree has been known to botanists. We have been able at last, however, to find a single perfectly developed fruit, and Mr. Faxon has succeeded in working out its structure for the plate in "The Silva of North America."

The flowers of Hypelate consist of a five-lobed calyx with ovate lobes imbricated in æstivation, slightly puberulous on the outer surface, ciliate along the margins and deciduous. The petals are rather longer than the calyx-lobes, imbricated in æstivation, concave, and rounded at the apex, with ciliate margins; they spread at maturity and are white. There are seven or eight stamens inserted on the margin and between the lobes of the annular fleshy disk; the filaments are filiform, as long as the petals in the sterile flower, and shorter in the fertile flower; the anthers are oblong, attached on the back near the bottom with two cells spreading from above downward and opening longitudinally. The ovary is sessile on the disk, slightly three-lobed and contracted into a short, stout style, terminated by a large, declinate, obscurely three-lobed stigma; in the sterile flower it is reduced to a mere rudiment. There are two ovules in each cell borne on the middle of its inner angle, amphitropous and superposed, the upper ascending with the micropyle inferior, the lower pendulous with the micropyle superior. The pistil ripens into a small, black, one-celled drupe, crowned with the remnants of the persistent style, and supported on the persistent base of the calyx. The outer covering is very thin, although fleshy and rather juicy. The stone has very thick bony walls, and contains a single suspended seed developed from the lower ovule. The seed is destitute of albumen, with a thin, slightly wrinkled testa. The embryo is conduplicate, filling the cavity of the seed, with thin, foliaceous, irregularly folded cotyledons incumbent on a long radicle which points toward the hilum.

It appears from the character of the embryo that Hypelate must occupy an anomalous position among the genera of *Sapindaceæ*, and that it does not readily fall into any of the tribes into which the family has been divided by Bentham and Hooker in the "Genera Plantarum." It may perhaps best be placed at the end of *Sapindeæ*, which it serves to connect with the *Acerineæ*.

Another West Indian tree which occurs also in Florida has often been referred to Hypelate. This is the *Hypelate paniculata* of Cambessides, which was first referred by A. L. de Jussieu to *Melicocca*, and which much later was described independently by Macfadyen in his "Flora of Jamaica" as *Exothea oblongifolia*, his genus Exothea being established for this plant. Radlkofer has already taken up Macfadyen's genus Exothea in Durand's "Index Generum," and the structure of the fruit of Hypelate shows that his view is correct, and that these two Florida trees cannot remain in the same genera. The fruit of Exothea, unlike that of Hypelate, is baccate, with one perfect cell and the rudiments of the second, with thick dark purple flesh surrounding a large, solitary, oblong, suspended seed without albumen, and with a thin shining testa. The embryo fills the cavity of the seed with very thick, fleshy, plano-convex, slightly puberulous cotyledons, and a short, superior, uncinate radicle turned toward the hilum, and enclosed in a lateral cavity of the testa.

Our Florida tree should be known as *Exothea paniculata*, Radlkofer, instead of *Hypelate paniculata*, Cambessides.

Radlkofer (*Sitz. Acad. Münch.*, xx., 276) refers to Exothea as a second species, *E. Copallilo*. This is a plant discovered in southern Mexico many years ago by Schiede and Deppe (No. 1295), and merely noticed under its vernacular name, "Copallilo," in the enumeration of their plants published in 1831 by Schlechtendal in the sixth volume of *Linnæa*. According to Radlkofer, it is the *Retonia* species of Hemsley ("Bot. Biol. Am. Cent.," i., 213). Of this plant I have no knowledge beyond that gathered from the brief account inserted in Radlkofer's paper. *C. S. Sargent.*

New or Little Known Plants.

Lycium Chinense.

ALMOST every one who has lived in the country is familiar with the Matrimony Vine, with its weak, drooping stems, which fall to the ground unless supported, its pale gray-green foliage and purple flowers, which are borne in pairs from the axils of the leaves, and which, from their close contact side by side, give to this plant its familiar name. It is a species of Lycium, and is related to the Potato, the Tomato and the Solanum, as may be seen from the fruit, which is a small, bright red, oval berry, a good deal like that of some Solanums. It is a native of the Mediterranean region, and botanists call it sometimes *L. Europeum* and sometimes *L. vulgare*. Fifty years ago it was the custom in this country to plant a Matrimony Vine on an out-house or a fence whenever any attempt at all was made at gardening, and now, in some parts of the United States, this plant has become fairly naturalized.

Lycium is a genus with many species widely scattered through the temperate and warmer regions of the world, especially in the countries surrounding the Mediterranean basin, in China, and in the south-western parts of the United States and the adjacent territory of Mexico. There is another species which is an old inhabitant of European gardens and which is sometimes cultivated in this country.

Indeed, it is probable that it has been often confounded with the more common species. It is *Lycium Chinense*, a native of China, and in every way a more desirable plant than the first. It produces weak stems ten or twelve feet long which, unless they are attached to a support, lay prostrate on the ground and are never strong enough to support themselves. When trained, however, to a post or pillar or over an arbor, they assume an upright position and soon cover a large space. The branches develop stout lateral spur-like branchlets, and are more or less armed with stout spines. The leaves are bright green and are produced in great profusion; they are ovate, acute, an inch or two inches long, and remain fresh and bright until destroyed by severe freezing. This plant begins to flower in the late spring, and continues to produce its abundant flowers until growth is stopped by cold in the autumn. The flowers are rather larger than those of the Matrimony Vine, and are bright purple. The fruit, however, is its great beauty. This begins to ripen in early autumn and loads the branches until winter. It is oval or oblong, nearly an inch long, and bright scarlet. As it ripens at the time the plant is covered with green leaves, the contrast between the dark green foliage and the scarlet fruit is extremely beautiful, and there are very few hardy plants which can be grown in the climate of the northern states which are more beautiful in autumn or which are more desirable when fruit-effects are desired. It is perfectly hardy, it grows with the greatest rapidity, and can be readily propagated by division, as it suckers freely, or seedlings can be easily raised. It is not particular about soil, and is admirably suited to cover rough banks or rocks, where it may be allowed to grow without support, or to train over fences and other structures.

The character of the Chinese Lycium in fruit is shown by the illustration on page 102, made from a photograph of the end of a branch taken late in the autumn.

Cnicus Hillii.

PROBABLY the oldest botanical name of our eastern pasture Thistle is that of Muhlenberg, *Cnicus odoratus*. It is the *Circium pumilum*, Spenger, and *Cnicus pumilus*, Torrey. It is found from eastern Massachusetts to Delaware, and, while not of great size for a plant of the genus, is noticeable for its large, showy and fragrant flowers. While low it is stout, having large, sparingly branched roots of nearly even thickness. I have not found that any of these were hollow. The involucral scales are unmarked, or marked rarely with a light glutinous line; the anthers have very little acumination, and the tips of the pappus are mostly spatulate and ciliate.

In the year 1867 the late Elihu Hall collected, near Athens, Illinois, specimens of a Thistle which he referred to the above. This passed under the eye of Dr. Gray while making up his account of the genus for the Synoptical Flora. His note in my herbarium shows that he saw that it was different from the eastern plant, although he did not mention it in the Flora. Last year that observant botanist, the Rev. E. J. Hill, collected specimens on the sandy borders of Lake Michigan, and sent me excellent notes which seem to show that it is specifically distinct from the eastern plant. He had previously collected it at Cankakee, Illinois.

Just as these notes were in hand I have received Mr. Hitchcock's excellent Catalogue of the Plants of Ames, Iowa. A reference to page 505 will show that our plant extends to that point. It may reasonably be looked for in other localities.

From Mr. Hill's notes I have the impression that the western plant flowers some weeks earlier than the eastern one.

A comparison of the foregoing with the following description will serve to show the points of difference.

Cnicus Hillii: general appearance much as in *C. odoratus*, but the whole plant of smaller and more simple habit (fifteen to twenty inches high), rarely with more than one head; root perpendicular, fusiform, very slender and hollow (teste Hill) for two to six inches below the crown, then enlarging and tapering to the end, the whole eight to twelve inches long; leaves smaller, less spiny and less divided than in *C. odoratus;* scales of the involucre having a dark, glutinous line on the back; pappus usually slender-pointed, but occasionally a few with narrow spatulate tips; anthers more or less acuminate. From central Illinois to central Iowa.

Wilmington, Del. *William M. Canby.*

Foreign Correspondence.

London Letter.

THE EXHIBITION at the last meeting of the Royal Horticultural Society was of more than ordinary interest. Orchids, Chinese Primroses, Cyclamens and other plants were represented by exceptional specimens, both in regard to their cultural excellence and in their rarity and beauty. The winter we have had here has been all against good horticulture. No one would have been surprised if Mr. Cannell had declared that his Primulas had all gone wrong because of the fogs and darkness. But Mr. Cannell's marvelous exhibition of these plants last Tuesday told a very different tale. The "Swanley strain" of Primulas spoke for itself and spoke loudly through these plants, which were nearly two feet across, a foot high, and many of them with a dozen large many-flowered trusses of blooms as large as a florin, of extraordinary substance, the margins elegantly crisped and the colors superb. Some of the new varieties are almost scarlet, and Mr. Cannell declares that before long he will produce a Primula by the side of which the soldier's coat shall pale. Swanley Blue is a pale violet-flowered variety, and Swanley White is an excellent kind. The largest plants shown were two years old, and had flowered freely and also borne a crop of seeds in their first year. "All the result of common-sense cultivation, aided by our special manure, which is really capital stuff," says Mr. Cannell. But his common-sense treatment for Primulas is specially constructed houses, with hot-water pipes close to the roof as well as below the stages; careful ventilation in damp weather and very careful selection in the matter of varieties.

A group of Cypripediums, mostly hybrids, was exhibited by Messrs. Pitcher & Manda, of Swanley. Fifty-nine kinds were represented, and whilst the flowers of many of them were attractive the majority had no special charm beyond that of novelty; but to many collectors of Cypripediums novelty alone is asked for. Messrs. F. Sander & Co. showed a beautiful group of Orchids, among them a grand plant of *Odontoglossum Edwardii*, with two long, branched spikes of purplish flowers; *Oncidium Brunleesianum*, a pretty little species of the *O. sarcodes* section. When introduced and first flowered in England six years ago this plant produced a spike of no less than 150 flowers. Each flower is half an inch long and wide, the sepals primrose, the petals yellow barred with brown, whilst the three-lobed lip, which is folded behind and tongue-shaped in front, is colored deep maroon. A portion of the original plant was sold for 150 guineas. *Dendrobium Luchianum* and the pure white-flowered variety of *Coelogyne cristata*, known as Hololeuca, were also among the plants sent from St. Albans.

Phajus grandifolius, an old favorite in gardens, was shown exceptionally well by B. S. Williams & Son. It was in a twelve-inch pot and bore no less than fourteen spikes, averaging a yard in height and crowded with flowers. Old though this plant is, it does not occupy as prominent a place among popular Orchids as it merits, for, in addition to its massive beauty, it is as easy to grow as a Gladiolus and as certain to flower. *Cattleya amethystoglossa* (Prinzii) was shown with stems over a yard high and an enormous head of its large, richly spotted, amethyst-lipped flowers.

The following plants obtained certificates:

CATTLEYA TRIANÆ, var. PLUMOSA, remarkable in having a line of crimson down the middle of each of the rose-colored segments, and a lip colored rich maroon.

CYPRIPEDIUM CREON.—A hybrid raised by Messrs. Veitch from *C. œnanthum superbum* and *C. Harrisianum superbum*.

ODONTOGLOSSUM TRIUMPHANS, Whiteley's variety, a large and richly colored variety, much superior to the typical plant, handsome though this is.

IRIS DANFORDIÆ.—A dwarf plant with dull yellow flowers spotted with green. It was scarcely worth a floral certificate.

CHORIZEMA LOWII.—A pretty seminal variety of what is known in gardens as *C. varium splendens*, itself a good, useful greenhouse plant, but a long way inferior to its offspring, which was raised in Messrs. Low & Co.'s Enfield Nursery. As shown, it was one and a half feet high and formed a compact, many-branched elegant plant, every branch terminated by a raceme of richly colored flowers, half as large again as those of the parent and much brighter in color. This is a really pretty addition to a genus of greenhouse plants which are far less difficult to manage than the majority of hard-wooded plants, with which Chorizemas are classed.

HAMAMELIS ZUCCARINIANA is a dull-colored variety of the well-known Witch Hazel, *H. arborea*. The last-named is now a beautiful picture in one of the shrubberies at Kew.

Messrs. Veitch, who exhibited the plant certificated, also showed *H. arborea* in good condition.

Several of Mr. Cannell's Primulas obtained certificates.

The annual general meeting of the Society was held last Tuesday, when the statements made by the President, Sir Trevor Lawrence, with regard to the work and position of the Society gave unqualified satisfaction. With a balance in hand, a rapidly increasing constituency, and general enthusiasm among the leaders of the Society the prospect is exceptionally hopeful. Of the £40,000 required to build a hall and offices for the Society in London £27,000 has already been promised.

Disa longicornu.—Tubers of this interesting Orchid were sold at an auction sale in London last week. Although collected on Table Mountain, and described by Thunberg in 1773, it does not appear to have ever been cultivated or, at any rate, flowered in England. It has small Orchid-like tubers, a stem only two or three inches long clothed with about six leaves, which are oblong, acute, wavy, and three inches long. The scape is six inches long, one-flowered, and the flower is as large as that of *D. grandiflora*, but very different in form. The upper sepal forms a large trumpet-shaped, long-spurred, wide-mouthed hood, and the three lower segments are oblong and spreading. The whole flower suggests a Columbine, and is colored lilac-blue. According to Bolus, this species is found only on Table Mountain, where it grows "among moss or grass in clefts of steep rocks on the sides turned from the sun, where the water drips in early summer, at an altitude of 2,100 to 3,000 feet. It flowers in December and January." The

Fig. 20.—Lycium Chinense.—See page 100.

tubers of these beautiful Cape Disas cannot, unfortunately, be gathered except when the plants are in flower, and consequently before they are anything like mature. To lift any plant, even a Tulip or Hyacinth, when in flower, and at once dry it, would be to run the risk of losing it altogether, but in the case of such delicate plants as these tuberous-rooted Orchids the chances are a hundred to one against their recovering.

Angræcum fragrans is attracting some attention now, a figure of it having been prepared for the *Botanical Magazine* from a plant in flower at Kew, and an account of its economic value will shortly appear in the *Kew Bulletin*. The leaves of this species are made into tea in the Island of Bourbon, where the plant is a native, and sold in Paris in boxes containing sufficient for thirty cups, at 1f. 25c. per box. Cigars are also made from the leaves in Mauritius. There are remarkably few Orchids of any economic value, the most important being Vanilla. The Angræcum is scarcely likely to become of much value commercially, as the plant is small and difficult to cultivate. It may be called a large edition of *A. (Mystacidium) filicorne*, the stems being short, the leaves oblong, three inches long, and the flowers in small racemes, each being an inch across, pure white and fragrant. The leaves when dry have an odor of vanilla.

London. *W. Watson.*

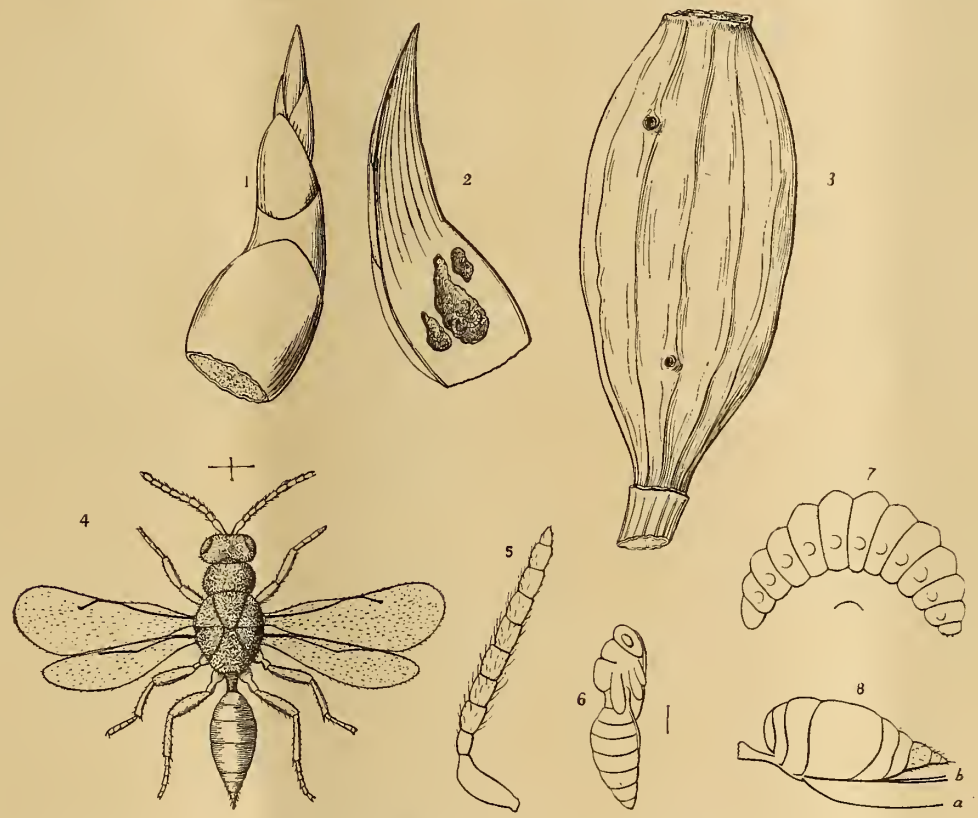

Fig. 21.—An Insect Pest (*Isosoma orchidearum*) —See page 99.

1. Infested bud or pseudo-bulb, abnormally swollen. 2. Section of bud showing cavities made by larvæ. 3. Old pseudo-bulb showing holes where flies have escaped. 4. Perfect insect, female (magnified). 5. Antenna of female (magnified). 6. Pupa (magnified). 7. Larva (magnified). 8. Abdomen of female showing ovipositor (*a*) and free part of sheaths (*b*) as they appear when drawn from their closely fitting place on the abdomen (magnified).

Cultural Department.

Iron-clad Seedlings.

While there can be no question of the fact that the importation of varieties of fruit-trees from north-eastern Europe has been of advantage to the orchard-growers of the cold north, and has given them courage to persevere in their efforts to produce a supply of home-grown tree-fruits, it ought not to be forgotten that some of our most valuable iron-clads are native seedlings. Among these a certain number have sprung from these foreign varieties, and I have no doubt that many more valuable sorts will be thus produced. The Wealthy, for instance, is supposed to be a Siberian Crab seedling—perhaps, and even probably, crossed from the Fameuse. But the equally hardy Scott's Winter, which stands the cold and dry climate of Iowa and southern Minnesota rather better than the Wealthy, is unquestionably a pure product from our common apples of New England. McMahon's White, from Wisconsin, is probably of like origin; and yet, so far as I can decide, after a dozen years' trial, it is as hardy as Oldenburgh.

In growing seedlings with the hope of getting valuable market varieties of tree-fruits, adapted to our northern tier of states and the Canadian provinces, many more failures than successes are sure to be encountered, for we want not merely hardy trees, but meritorious fruits. Yet the mere obtaining of an iron-clad tree is something. Six or seven years ago I had sent to me fifty Pear-seedlings, grown from seeds of standard varieties of the hardier class, such as succeed on the Champlain Islands, near the Canada line. These seedlings were set out in a nursery row, with the object of budding upon them some of the iron-clad Russian Pears. They were left standing three or four years before budding; and each winter all but one of them were killed to the snow line. When the others were budded, close to the ground, with the Bessemianka Pear (which seems to be the hardiest of the Russians), this uninjured seedling was left; and two years later it was, with the budded Russians, transplanted into the orchard. It has now passed through several of the hardest winters on record in north-eastern Vermont without the slightest injury, growing strongly each season from its terminal buds; and it is now as sound and healthy as the Russians in the same row. The chances are, of course, that it will not produce a valuable fruit, but, waiting for a test of that, I still value it, and take pleasure in calling attention to it, as showing that iron-clad seedlings can be grown from the older race of Pears—none of which is iron-clad.

Appeals are frequently made to fruit-growers in the cold north to grow seedlings, and allow them to bear before grafting them. But it is a heavier task than many can be induced to attempt. Of a thousand such seedlings there is hardly a chance that more than half a dozen will be really iron-clad, and of such a possible half-dozen how many could we reasonably hope to bear valuable fruit? Maine is a state of seedling orchards, and has been so for a hundred years, yet Maine has not, among many excellent summer, fall and early winter apples, brought out a single long keeper of noticeable merit. Her commercial orchards are all planted with varieties originating outside of her boundaries. It is probably true that no expert has made a business of examining the seedling orchards of Maine with a view to the discovery of valuable kinds. If my own experience is any criterion, I should say that it would be very desirable to have such a search instituted either by the State Pomological

Society or the Horticultural Department of the State Agricultural College.

Within the limits of a single town in northern Vermont I have in the last twenty-five years come upon three useful iron-clad seedling winter Apples of the old strain, one of which (Scott's Winter) has become a standard sort, advertised by nearly all the great nurseries east and west.

But, with all this, I would not discourage the growing of seedlings. All of us can do a little in that way, and sometimes a great success comes with very little effort. The late Mr. Dudley, of Aroostook County, Maine, got from a few seeds of Oldenburgh, planted in his garden, a large, handsome, productive and very good winter apple of the type of its parent. This experiment (as well as that of Mr. Gideon in producing the Wealthy, and of Mr. Cady in producing the Northfield Beauty of Vermont) has practically demonstrated the error of the position taken by some writers that we cannot expect to get winter varieties from seeds of summer and fall apples. Undoubtedly much the larger number of seedlings will yield early fruit. The proportion of early to long-keeping varieties of apples the world over is very great, and naturally so, since all the wild types are of that sort, and keeping apples are the product of human perseverance in growing seedlings.

What I particularly wish to urge, without discouraging the propagation by seed, is a careful examination of the millions of seedlings already in existence upon farms all over the continent. Unless one goes about among the farmers, especially in what are called the "back towns," he will get very little idea of the immense number of these seedling fruit-trees. Seedlings cost nothing, and many of our poorer farmers, discouraged by the costly and generally worthless trees sold them by peddlers, plant none but seedling trees. The women of our back farms are particularly noted for this. They find a special interest in raising fruit-trees from seed, and thousands of them are quietly proud of growing in this way apples that they fondly believe are "better than any of your grafts." It is true that they are not very good judges on this point, but sometimes they will really surprise one with the excellence of the fruit of some favorite tree, the child of their tender care and patience. Few of these "fill the bill" entirely, yet we must remember that all of our best fruits were once obscure seedlings, many of them brought to notice only through what seemed a chapter of accidents.

Newport, Vt. *T. H. Hoskins.*

Dieffenbachias.

THIS very handsome genus of tropical Arads has now become quite common in cultivation, several valuable additions having been made in recent years, though several of the older species are also well worthy of more extended cultivation. It will, of course, be understood that these plants are not to be recommended for house decoration, as the majority of the Dieffenbachias would suffer from any long exposure to such conditions, but in a collection of stove plants they are remarkably attractive, and, being comparatively easy to grow, may be commended to amateur cultivators as well as to professionals. These plants prefer an open mixture consisting of nearly equal proportions of turfy loam and peat, a moderate quantity of dry cow-manure and some sand, and when given such a compost as this and a temperature of sixty-five to seventy degrees, in a house pretty well shaded, the result is usually satisfactory. They also require liberal watering and syringing when in full growth, so that red spider may not get a foothold, for if this be allowed the beauty of the foliage will soon be ruined. They are propagated by cuttings, which may be made from the tops or from single eyes of the old stem, the first being preferable if specimen plants are desired. A strong top will make a better furnished plant than an eye-cutting; but if quantity is the object, of course the latter is more desirable.

Among the older species *D. Baraquiniana* is very desirable when well grown. It has leaves about a foot in length and from four to six inches wide, these being bright green with a white midrib, and the surface of the leaf more or less spotted with white. The leaf-stalks are also pure white, which adds much to the beauty of the plant. *D. Baraquiniana* is one of the oldest species in cultivation, having been introduced from Brazil more than a quarter of a century ago.

D. Bausei is also a fine variety, and much more dwarf and compact in growth than the preceding. This is a garden hybrid that originated in Europe perhaps fifteen years ago, and has broad leaves that are frequently over a foot in length. Their ground color is yellowish green, and this is blotched with darker green and spotted with white. *D. Bausei* makes a charming little specimen, and is well adapted for cultivation where there is not sufficient space at command to grow the stronger kinds.

D. eburnea is another small-growing species that is worth a place. It has oblong-lanceolate leaves of light green color and much spotted with white. The foot-stalks are pale brown and somewhat marked with white, and the whole plant is graceful and elegant.

D. imperialis is one of the largest of the genus, and has very dark green leaves that are blotched with yellow. These leaves are two feet or more in length, rather stiff-looking, and they have much substance. This species enjoys strong heat, and is a remarkable plant when in good condition.

D. Bowmannii is also a strong grower, and, like the preceding, is a native of America. This fine species produces leaves about two feet in length and half that in width, the color being deep green, more or less blotched with irregular markings of very light green. *D. Bowmannii* was introduced about the same time as *D. Bausei*, and, like it, makes a handsome specimen.

D. Carderii is another attractive introduction of recent years. It is of compact habit and moderate growth, the leaves being dark green in ground color, but much marked with yellowish variegation. It is a native of Columbia.

D. Regina is one of the most striking of the newer Dieffenbachias, the leaves being nearly covered with yellowish white markings. It is of moderate growth, the stem being quite short-jointed and the petioles also rather short, thus giving it a compact habit.

D. nobilis is another good sort, and it produces rather longer leaves than the preceding. These are from eighteen inches to two feet long and about nine inches broad, and much blotched with white near the midrib. This species is quite strong in growth, and, like so many other members of this genus, is a native of Brazil.

D. Weirii is one of the prettiest dwarf species, the leaves being rather narrow and seldom more than one foot in length. Their ground color is dark green, varied with spots and blotches of yellowish green. This is really a pretty little plant, though but seldom seen of late years.

In addition to the species here briefly noted there are several others also worthy of general cultivation. The juice of the Dieffenbachias is more or less poisonous, and is likely to irritate any cut or sore on the hands to which it may be applied, and it is well to exercise proper care in handling the cuttings of these plants.

Holmesburg, Pa. *W. H. Taplin.*

Brunsvigias.

OF the several species of Brunsvigias I have cultivated but two—*B. Josephinæ* and *B. gigantea*, commonly known as *B. multiflora*.

The bulbs of both species are very large; that of my specimen of *B. Josephinæ* is about twelve inches long and five inches thick. Its color is blackish brown and its outer layers are soft to the touch. During the twenty years I have owned this bulb it has not increased in size as far as I can determine. During this time it has been repotted not more than four times, and for fifteen years has blossomed every year but one, it having declined to do so in 1887.

The treatment it has received has been as follows: It is potted in a compost of rotted sods, a little leaf-mould and a little sand in an eleven-inch pot. It passes the summer, from June to September, under a tree, and laid on its side to keep it dry. I do not generally begin to water it until the flower-stalk begins to push, generally the first week in September. When this occurs I place it in the greenhouse, and give it about a quart of water every day until the short days come. From November 10th to March 1st, once in three days is often enough to water it or any other bulb. The flower-stalk is ashy-purple, about an inch thick, and so very brittle that last fall when I lifted the pot suddenly it snapped off, and I had no flowers. If no such mischance occurs the great umbel of blossoms will be fully expanded in about two weeks from the time they begin to appear. In number they vary from thirty to fifty, each being at the end of a pedicel nine inches long, so that the entire flower-head has a diameter of a foot and a half. The individual blossoms are about three inches in length and two wide, of a very elegant shape and of a brownish crimson color. The whole plant is very striking and ornamental in appearance. As in most Amaryllids, the leaves follow the flowers; they attain a length of two feet, with a breadth of five inches.

During all these years no sign of an offset has appeared. Seeds are formed in abundance; they are as large as a small

pea, almost white and sprinkled with minute red dots. They are of the bulb-like appearance noticeable in those of Nerine and *Amaryllis Belladonna*, and, like those, are best sown on the surface of the soil. Those I have tried have germinated readily, but I threw them away as soon as my curiosity on that point was satisfied, for I do not believe that seedlings would attain a blossoming size in less than forty or fifty years. Burchell, in his account of the nearly allied *Ammocharis coranica*, which he found in thousands in Caffraria, declares that from a careful dissection of bulbs eight inches in diameter he does not believe that that size was attained in less than two hundred or three hundred years. *B. Josephinæ* first flowered in cultivation in the gardens of the Malmaison, and was named in honor of the Empress Josephine.

All that has been said of the cultivation of *B. Josephinæ* is applicable to *B. gigantea*. The bulbs of the latter species are almost spherical and light yellowish brown in color; the outer coats are very hard and stone-like and very brittle. The foliage is peculiar, each leaf being about fifteen inches long, very broad, and rounded at the end; shaped, indeed, much like a beaver's tail. The flowers resemble those of *B. Josephinæ* in form, and are produced every year; they are less numerous, and though much brighter in color, are less effective because they are greenish at the base.

Canton, Mass. *W. E. Endicott.*

Snowdrops.

Galanthus Fosteri.—So prevalent is the idea that size is necessarily an element of beauty in a flower that the first view of this new Snowdrop is a disappointment. Herr Max Leichtlin considers this the King of Snowdrops, and thinks that under cultivation it will prove the finest of the family. The fine bulbs with which I was favored last fall were collected ones, and, of course, do not do the variety justice, but, from present appearances, they must improve very materially before they produce flowers to equal those of *G. Elwesi* in mere size. However, this is a beautiful variety of *G. latifolius*, with firm Scilla-like foliage, and sepals which seem scarcely as broad as those of good specimens of *G. Elwesi*. The perianth-segments are pure white, with a slight line of green under the notched edges and a dot of green at the base of each petal—a most charming interior.

Galanthus Elwesi.—This Snowdrop commenced blooming on a south border late in January, and its large but dainty flowers again proved the earliest harbingers of a new garden season. There is a special charm attached to this delicate flower which weather of the wildest does not discourage. The fiercest storms simply toss their beautiful blooms gracefully about, and they cheer one in this gloomy season with their look of contentment under most disheartening surroundings. I have noticed that this Asia Minor variety has been said to be sometimes of a rather delicate constitution, but I can see no indication of this in my border, which contains a few hundred bulbs collected in 1889. They are now in good condition, with flowers large and sepals mostly wide and of good, firm texture. Like most collected bulbs they vary somewhat in form and in bud—I notice some quite spherical, while others approach the long dainty form of *G. nivalis*, though in all cases very much larger.

One cannot have too many Snowdrops. Either in the borders, in the grass, or for naturalizing they are never out of place and never too abundant, and as the heralds of spring one welcomes them year after year with increasing interest. White flowers are never very showy in the garden, and while *G. nivalis* is a gem, *G. Elwesi* is so much larger (yet without a trace of coarseness) that it should always be planted in preference where the greatest effect is desired. These bulbs have been collected in such quantities that there is no reason why the dealers should not reduce the price and give every one a chance to plant them largely.

Elizabeth, N. J. *J. N. Gerard.*

Iris Bakeriana came into bloom in the open border on the 23d of February. This beautiful little Iris, with its blue standards and tigered falls, has been several times described in the columns of Garden and Forest, but its perfect hardiness and natural season of flowering in this latitude do not seem to have been noted. Planted in August, 1890, in a group with several others of the type of *I. reticulata*, this Iris (as well as the others) has been entirely without protection. The garden was continuously frozen from December 1st till some time early in January, and part of this time the bed had a slight covering of snow. Shortly after the change to mild weather the foliage commenced to spear up, and has not been damaged by any of the constant vagaries of the temperature. When showing color a pane of glass was fastened over blooms to protect them from moisture, and at this writing it is doing duty as a snow-shed. One hesitates to speak confidently of any plant on a single test, but, judging from the trial of this Iris during the rather hard winter just past, I think there can be little doubt of its perfect hardiness.

After some experience with *I. reticulata*, however, I am inclined to make the reservation that, as with most naturally early-blooming plants, care should be taken in selecting a suitable location. Snowdrops, Squills and some Anemones may be planted anywhere, as the most trying weather affects them little, if at all; but it seems better to plant such things as these little Irises in a position where they will not start much before their natural season even if the weather should happen to be mild earlier. A good position, I find, is on a border which is slightly shaded from the winter sun by a low picket-fence till late in January. In such a location the earth remains, as a rule, continuously frozen till late in the winter, and when the sun rises to soften the bed the plants are ready to spring into bloom with little danger to fear from sudden changes. But, aside from the interest of flowering these little gems in the open ground, perhaps, until one has some surplus stock, more enjoyment could be had from them if planted in a cold-house, where one could study their dainty beauty with no fear of pneumonia.

Elizabeth, N. J. *J. N. G.*

Phalænopsis Stuartiana.—In the gardens of Mr. H. H. Hunnewell, at Wellesley, Massachusetts, there are several plants of this species now in flower, one of them having an arching scape thirty-one inches long, and bearing fifty-eight flowers. It has five leaves about twelve inches long and three inches across. Some five years ago I cut from the root of one of these plants a piece on which two small leaves were growing, and, placing it carefully in a small saucer with four or five bits of potshreds with charcoal and sphagnum, it has now grown into the plant above described. It was permitted to flower for the first time last year; the scape then had nineteen flowers.

South Natick, Mass. *F. Gould.*

Correspondence.

Orchids at North Easton, Massachusetts.

To the Editor of Garden and Forest:

Sir.—At the gardens of F. L. Ames, Esq., the cool Orchid-houses are particularly gay, even thus early in the season. During a recent visit I noted in particular some exceptionally good varieties of *Lælia anceps*, among them a form of Virginalis called Alba, which is very nearly pure white, there being only a faint yellow blotch in the throat. The variety Williamsii has very large white flowers, with a yellow blotch in the throat, and violet-colored lines radiating therefrom. Sanderiana is often confounded with this plant, but its flowers are smaller, and the throat and tip of the labellum are shaded with violet-purple, with an intermediate bar of white. The whole flower of the variety Winniana is of a deep violet color, the lip being a shade darker than the sepals and petals, while Percivaliana is the very opposite of this, being a very light mauve.

It is still rather early for Dendrobiums, but some rare and beautiful specimens are in flower. In comparison with the flowers of *D. nobile*, those of its variety Elegans are more regular. The sepals and petals and lower part of the labellum are a soft creamy white, in striking contrast with the deep wine color of the interior of the labellum. The variety Nobilius of the same species is a most striking one. The entire flower is a deep maroon-purple, excepting only a small part of the lip. *D. infundibulum*, var. *Jamesianum*, is noticeable for the large size of its flowers, the purity of its white sepals and petals, and its deep yellow tubular throat. *D. Schneiderianum* (*D. Findlayanum* × *aureum*) is the most beautiful of the many hybrids now in bloom. The lobes of the labellum reflex gracefully, with chocolate and orange markings in the throat. The sepals and petals are pale pink, the latter wavy. In the size and color of its flowers and slight fragrance it resembles the seed parent, *D. aureum*, but in length of pedicels, which gives the plant additional grace, it inherits the good qualities of its pollen parent. This is a well-bloomed specimen, bearing forty-five flowers on two stems. *D. micans* (*D. Wardianum* × *lituiflorum*) is another handsome hybrid, in which the flowers are more nearly like those of *D. Wardianum* in shape, the trumpet-shaped labellum peculiar to the seed parent being very slightly developed. In reference to the variety of *D. Wardianum* known as Schrœderi, Mr. Robinson, the head-gardener of the establishment, aptly says that it bears to the type the same relation that the variety Nobilius does to *D. nobile*.

A remarkable specimen of *Vanda cærulea* is now to be seen here. The flowers are over four inches in diameter. The coloring of the petals and labellum is a deep blue; the sepals are lighter, with a still lighter, nearly white, marbling over the whole flower. *Cattleya Trianæ*, var. *Leeana*, is a portion of the original plant. In the size of its flowers it is a monster, some of them measuring eight inches across the petals, with a proportionately large labellum. The petals are lilac-mauve; the lip deep mauve; edges shading lighter; throat with yellow markings. *Cattleya* (*Lælia*) *Exoniensis* is a rare and beautiful hybrid, probably between *Cattleya Mossiæ* and *Lælia purpurata*, somewhat intermediate in character between these plants.

The very select collection of Cypripediums here contains some handsome specimens of many new and rare species, varieties and hybrids. *C. Morganiæ* (*C. superbiens* × *Stonei*) is conspicuous for the sulphur-green petals, with bronzy purple blotchings and ciliated margins. Its general habit is that of *C. Stonei*, with a pouch like that of *C. superbiens*. The fine specimen here now bears three scapes with ten flowers, and as recently as last August it carried twelve flowers on three scapes, and therefore it may be rated as a pretty free bloomer. *C. Mastersii* is a new species. The scape is erect, sixteen inches long, and hairy; the petals deep bronze veined with violet-purple, and pouch bronzy purple. *C. insigne Chantini* (Philbrick's variety) is, without doubt, the handsomest of the varieties of this fine species. It has a deep, arching, dorsal sepal, with reflexed margins. The white nearly covers the whole, and the violet punctation is very delicate. This is sometimes confounded with the varieties Maulei and Punctatum-violaceum, both inferior kinds, with a flat dorsal sepal. *C. Godseffianum* (*C. hirsutissimum* × *Boxallii*), now blooming for the first time, is of very recent origin. The centre of the dorsal sepal is a black bronze on a yellowish green ground. Petals large, wavy at the base, the upper part reddish purple, and the lower sulphur-yellow, with dark spots. *C. Leeanum superbiens* (*C. insigne* × *Spicerianum*) has a dorsal sepal not unlike that of the variety Chantini, but it is larger and almost wholly white, with violet punctation extending across the lower half and continued up the median line to the tip. *C. cardinale* (*C. Sedeni* × *Schlimii*) is a very handsome and almost continuous blooming hybrid in the way of *C. Sedeni*, but brighter; the pouch is more round and the petals are not twisted.

The new and rare *Odontoglossum Harryana* is now in bloom. It is probably the handsomest and most distinct of all the bronze-flowered Odontoglots. The sepals and petals are bronze, with clear yellow tips; base of labellum yellow and purple, with white lines and white tip.

Masdevallias were represented by many quaint and beautiful species and varieties. The *M. Chimæra* group, which have a strange fascination for many people, are here in full force. *M. Roezlii* almost black; *M. Winnianum* purple; *M. rubra; M. aurea; M. Veitchiana*, the ground color of which is orange-scarlet, with the violet hairs suffusing three-fourths of the surface, giving it a peculiarly brilliant hue; *M. ignea* with its varieties, Rubra and Aurantiaca; *M. Lindeni* and *M. Harryana*, conspicuous for violet shades, and *M. Tovariensis* are all represented by fine specimens. *Plurothallus Roezlii* is a curious novelty, with plum-colored flowers. Fine spikes of *Oncidium splendidum*, effectively placed, with the lovely pure white form of *Lycaste Skinneri*, bring my list to a close.

Wellesley, Mass. *H. G.*

Wanted, a Tract on Forestry.

To the Editor of Garden and Forest:

Sir.—The necessity of forestry reform is admitted by all intelligent people who take time to examine the question, but no reform can make much headway until the people at large become convinced of its necessity. The prime need, then, in every such cause is to instruct them as quickly as possible in that which so greatly concerns their welfare.

The two great avenues to the human mind are through the eye and the ear, and of these the first is, no doubt, the most important. That which we see makes, on the whole, the greatest impression. Such object-lessons, therefore, as that contemplated by the Adirondack League Club, referred to in your issue of February 18th, will, of course, be a vast help in forming a healthy public opinion concerning the management of our national forests. The fine example of the city of Lynn, which is now engaged in acquiring a vast and varied tract of adjacent woodland, embracing some 1,400 acres, to be held as a public forest and park for the use of the people forever, is another splendid object-lesson; the enterprise of the little village of Freedonia, New York, which has had the wit to seize the park idea by the right handle and forestall the future by boldly laying out two parks in the very heart of the town. These and other similar examples help along the causes with which they may severally be classified far more rapidly than can the very best of preaching. May such tangible teaching increase.

Yet there is a large and important work to be accomplished through the "foolishness of preaching." The press has done and is doing much. Still it occurs to me that there is need of, or at least room for, special work through such tracts as that one which assisted in the great reboisement of certain districts of France. There, the forests having disappeared through heedless cutting, and the turf been gradually destroyed by the sharp hoofs and the hungry gnawing of the flocks, great and increasing damage from floods began to overwhelm the valleys. To reclothe the heights and restore the equilibrium was found to be impossible until the people—the peasantry who had votes—had been won over. A prize was offered for the best short work adapted to teaching them these lessons, the little book "Studies of Master Peter" being the successful competitor. Some similar work, all the better if shorter, which could be widely disseminated among our rural populations would, I am confident, accomplish much toward producing a right popular view of the vast forest-interests of our land. Who will write one?

Dorchester, Mass. *S.*

[Mr. B. E. Fernow, Chief of the Forestry Department at Washington, has already written some leaflets for general distribution, but we cannot have too many of them nor have them prepared from too many points of view.—Ed.]

A Hand-book of Plants.

To the Editor of Garden and Forest:

Sir.—Can you refer me to some book which contains a description of all the plants in ordinary cultivation? I have examined a work in four volumes which seems to give the information I wish, but it is too expensive and cumbersome for my purpose.

Tarrytown, N. Y. *E. J.*

[Perhaps the best book for such a purpose is the "Hand-book of Plants" by Peter Henderson. The new edition, which was published something like a year ago, is practically a new book, not only because it includes such species and varieties of plants as have been introduced since the first edition was published, but because of the instructions given for the cultivation of various kinds of fruits and garden plants. Of course it is not so full as larger dictionaries like Nicholson's, but it has the advantage of being prepared expressly for American readers, and it will be found as complete as one ought reasonably to expect a book of such a size to be, and much more accurate than manuals of garden plants and practice usually are.—Ed.]

Primula obconica.

To the Editor of Garden and Forest:

Sir.—Ever since the first reports of the poisonous character of *Primula obconica* were published in your journal I have been examining and experimenting with it at times. In so far as structural features are concerned there is little to add to the excellent account by Dr. Thurber (vol. iii., p. 104). All parts of the plant are covered more or less densely with glandular hairs. The secretion is not so abundant at any time as to be viscid, and there is an entire absence of silicified hairs, which he suggests as a possible cause of the injury. There is nothing about this species which is widely different from *P. Sinensis* and *P. veris*, two old plants of gardeners, against which not a breath of suspicion has ever been raised. Figures of the cuticle made under the microscope show but slight differences in the length and profusion of hairs only. Otherwise one figure would stand for all three species.

Although I am moderately subject to plant-poisoning, all trials with *P. obconica* have given negative results, and I know of no one who has suffered, although several here have been frequently exposed.

Without calling in question the accuracy of reported cases, may we not put this Primrose into the list of plants poisonous, if at all, only to such persons as are extremely sensitive, and hence not necessary to be excluded from cultivation?

State College, Pa. *W. A. Buckhout.*

[It was nearly three years ago—that is, in the issue of Garden and Forest for May 3d, 1888—that Dr. James C.

White, of Boston, suggested *Primula obconica* as the probable cause of an inflammation of the skin of the hands and face of persons who had been handling it. In a later number he gave evidence to show that his original suspicion was probably correct. Since that time experience has abundantly established the fact that many persons are subject to an irritation of the skin, more or less severe, from contact with this Primrose.—Ed.]

The Owl and the Sparrow.

To the Editor of Garden and Forest:

Sir.—I am glad to see criticism of M. Naudin's proposal to send us an owl for the discouragement of the English sparrow and the possible slaughter of our native sparrows, wrens, bluebirds, yellow-birds and other insectivorous songsters. Allow me to add an appeal to those school-boys and others who are enthusiastic in collecting birds' eggs. A great deal more knowledge of birds and their ways can be gained by examining the nest occasionally without touching it or the eggs, and by quietly watching the old birds at their work; and by this method of study the unpleasant feeling which comes over one after robbing a bird's nest will be avoided.

Washington. *H. B. A.*

Recent Publications.

Among a number of interesting articles recently published by Mr. John Addington Symonds in a book called "Essays Speculative and Suggestive," are two which should have especial attraction for our readers.

Even a slight acquaintance with the author's previous works would justify the prediction that in the chapter called "Landscape" the subject would not be treated from the most obvious point of view. No one will be surprised to find that it is not an essay on landscape in itself, but on the way in which a feeling for natural beauty has developed in mankind, as shown by the art and the literature of successive periods. "It is an error," says Mr. Symonds, "to believe that the ancients were insensible to the charm and beauty of external nature. Much has been written about their attitude toward landscape and the parsimony of picturesque description in their poetry. Yet sufficient stress is rarely laid upon the difference between the Greeks and the Romans in this matter. Nor has it been made clear enough that classical literature in its later stages exhibits more of what we may call the modern feeling than we find in Homer and the Attic writers." This position is substantially the same as that which was taken by one of our contributors in the series of articles we printed last year on the "History of Gardening Art." However, there are some points of dissimilarity. The difference between the Greeks and the Romans in their feeling for nature was not then explained as Mr. Symonds explains it. But, on the other hand, Mr. Symonds does not dwell upon the fact, then referred to, that descriptive writing of any kind is almost absent from Greek literature. We think that the cogency of the statements in the beginning of his chapter would have been increased had he shown that, as the Greeks, despite the unquestionable strength and acuteness of their feeling for art, have left us no real descriptions of works of art, so it is foolish to argue, from the paucity of their descriptions of natural scenes, that they had no true feeling for their beauty. But nothing could be more clear and charming than the way in which he illustrates that abiding anthropological instinct of the Greek mind, which, leading it to personify all natural phenomena and forces, hardly left a place in literature or in art for the painting of purely natural scenes; and his account of the development of a different frame of mind in the later Latin poets is, in its scholarly quality, combined with its lightness of touch, a passage such as no one else could have written. Equally interesting is his exposition of the reasons why, when Christianity had banished the old delight in terrestrial things, together with the old vast company of imagined beings inhabiting nature, "both literature and the plastic arts decayed. Classical polytheism," he continues, "interpolated a multitude of ideal personalities between the mind and nature. All these were swept away. The soul was left face to face with God." The material world was evil, and there was nothing left but "infinity and fact. What would happen should theology relax her grasp upon the intellect and men once more begin to gaze around with curious delight on their terrestrial dwelling-place?"

It was in the time of the Renaissance, Mr. Symonds believes, that "the intellect of man came painfully and gladly to new life through the discovery of itself and nature." The Latin songs of the thirteenth century, "in so far as these touch nature, reveal a genial thawing of the spirit. They dwell on the charm of spring-time in the country and connect the freedom of the open air with pleasures of the senses. Classical literature is at work as a form-giving influence. The German lyrics of the Minnesingers, the Provençal lyrics of the Troubadours, the Celtic romances of Arthur and his Knights, when these touch nature are in like manner vernal. The magic of the May pervades them; the mystery of the woodlands enfolds them. They are the utterances of generations for whom life has revived." Then comes Dante with his keen feeling for natural beauty, and "contemporaneously with Dante—though Dante hardly shared this movement—there began what is known as the Revival of Learning: that resuscitation of classical literature and art which exercised so potent an influence over the mind of Europe." Inspired by classic example, poets and painters then began to express more plainly a love for nature; but it always was after the classic fashion, as a background for man and his acts, until the very close of the Renaissance period when five great painters gave landscape independent life and importance. These, says Mr. Symonds, were Rubens, Claude Lorraine, the two Poussins and Salvator Rosa; they were the first who "emancipated landscape from its traditional dependence upon human motives and proved that Nature in herself is worthy of our sympathy and admiration." With and after them came the great company of Dutch landscape painters, while "in literature classic standards of taste continued to prevail" until science brought her quota of influence, and, in our own century, poets took the same attitude toward nature that painters had begun to take in the seventeenth century.

It will be seen, even from this brief summary, that Mr. Symonds does not adhere to the usual belief that the modern love of nature is an inheritance from Teutonic ancestors; that the difference which, although it has been exaggerated, does really exist between the ancient world and our own in this respect is a difference in blood, in natural, instinctive habits of mind. He says, indeed, quite plainly, that when the Scandinavians and Teutons were Christianized and absorbed into the fellowship of nations, they "brought with them nothing which could constitute a new condition for the sense of natural beauty. Like the Greeks, they looked at the world from the standpoint of mythology. The cosmic forces were personified in their religous legends as ideal men and women. Norse poetry was ill adapted to fostering that sympathy with nature which had begun to germinate in the latter stages of Græco-Roman civilization." Moreover, he adds, "such as it was, the dominant civilizing energy, that of the Latin Church, laid it under strict interdict." There is no space here to give the reasons why we must dissent from this belief and fall in with the more commonly accepted one which regards the Teutonic mind as more susceptible to the influence of nature, simply and purely as nature, than the Greek or Latin mind. But we think that Mr. Symonds unconsciously shows this very fact when he cites the songs of the Minnesingers and the Celtic romances as exhibiting a true and tender feeling for nature. Undoubtedly, the influence of the classic world was felt in northern Europe before the time which we are accustomed to call the "dawn of the Renaissance"; but neither these poets, nor even Dante, can be said to have been moulded, even if they were touched by it. That there was a distinctively Teutonic influence at work in literature and art all through the middle ages, and that it affected even non-Teutonic nations, seems to us a clearly proved fact; and as clearly proved seems the fact that it meant a new and stronger feeling for natural beauty simply as such. To what, we wonder, would Mr. Symonds attribute the development of architectural decoration from the classic conventionalism of Romanesque times into the often directly imitative, wholly realistic types of the end of the thirteenth and of the fourteenth century?

The second chapter to which we have referred is called "The Pathos of the Rose in Poetry," and again it recalls something that was recently written in Garden and Forest. This time it is the whimsical complaint of Alphonse Karr, cited in an article about him (vol. iii., p. 522), that the Greeks had said one or two pretty things about the Rose, the Romans had added one or two more, and then the world had gone on repeating them over and over until they had become worse than commonplace. Mr. Symonds is not whimsical, and he does not complain of this repetition of ideas or say that it has resulted in commonplaces. He simply shows, in a very delightful way, how two classic poems, one by Catullus and one by Ausonius, have been re-echoed in later days and in different tongues. To quote from this essay would be like plucking off

a couple of petals to show the quality of a Rose, so we leave it to such of our readers as may be fortunate enough to chance upon Mr. Symonds' attractive book.

Notes.

According to the *Economiste Français* about 862,700 tons of coffee are annually produced in different parts of the world, more than half the amount being credited to Brazil.

Pomona is pronounced by Dr. Aldrich, of Ohio, a good Raspberry for the home garden, although the fruit is not firm enough for shipping. The plant seems hardy, and it is productive of large and fine-looking berries of excellent quality.

In an article in the *American Garden* it is stated that Mr. Thomas R. Ballantine, of Norfolk, Virginia, raises 125 acres of Spinach a year, the sowing of which requires two and a half tons of seed, and from which he harvests some 25,000 barrels. Mr. Ballantine grows the Savoy Spinach entirely.

Mr. Edwin Lonsdale, in the *American Florist*, calls attention to the fact that Carnations have received special attention by the Pennsylvania Horticultural Society, which offers premiums for groups of twenty-five varieties in special colors. These premiums are offered for competition both at the spring show, which opens on March 17th, and at the Chrysanthemum show in November next. Premiums are also offered for the best seedling Carnations.

Some time ago Mr. W. E. Endicott stated in this journal that he had hybridized the white form of *Freesia refracta* with *Tritonia crocata*, and the resulting plants bore flowers which were Freesias pure and simple, and yet the Tritonia was the seed parent. Very naturally, such a result has excited inquiry, to which Mr. Endicott responds that he took great pains with the experiment, and is perfectly certain of the fact. He adds that in his greenhouse the Freesia has never set seed.

The League of American Wheelmen has offered $100 in prizes for photographs which can be used to illustrate the unfitness of our present public roads as highways. Some suggestions for subjects are the following: A farmer's team and wagon hub-deep and knee-deep in a muddy road; views of rough and rutty roads; broken vehicles caused by rough roads or steep grades; smooth, hard-surfaced roads with teams hauling loads over them. These object-lessons ought to prove effective aids in the campaign against bad roads.

The rare and showy South African Groundsel, *Senecio petasites*, lately noticed in these columns, has been blooming for some time in the greenhouses of B. P. Cheney, Esq., Dover, Massachusetts. The stems are herbaceous, about three feet high, terminated with a broad umbellate panicle of bright yellow flower-heads. To those who tire of Cinerarias, Cyclamens, Calceolarias and the generally grown winter decorative plants, this is a welcome introduction. It may be propagated either by seeds or cuttings, which develop at the base of the stems.

The Committee on Nomenclature of the Society of American Florists has named sub-committees, to each of which is to be referred questions as to the names of a single plant or class of plants. The following are the chairmen of the several sub-committees: John N. May, Roses; Edwin Lonsdale, Carnations; John Thorpe, Chrysanthemums; E. G. Hill, Bedding Plants; Charles D. Ball, Palms and Ferns; Robert Craig, Miscellaneous Greenhouse Plants; Ernest Asmus, Bulbous Plants; William R. Smith, Hardy Plants. William Falconer, Glen Cove, New York, is General Chairman.

A late bulletin from the New Jersey Experiment Station aims to acquaint the people of that state with the true character of the Black Knot of Plum and Cherry-trees and to stimulate united action for the suppression of the disease, which has practically driven two of our best orchard fruits out of cultivation in many parts of the country. If it is proper to pass laws compelling land-owners to prevent noxious weeds from going to seed on their premises, why not compel owners of trees infected with this fungus to cut off and destroy the diseased branches? The spores of this fatal fungus are surely as much to be dreaded as are the seeds of Canada Thistle.

Last year Professor Roberts, of Cornell University, removed the tassels from every alternate row in a plot which contained forty-eight rows of Indian Corn. The tassels were cut as soon as they could be seen and before they had produced any pollen. In no single case did a row upon which the tassels were left produce nearly as much as the rows on either side of it from which the tassels had been removed. In the aggregate, the number of good ears in the rows of emasculated plants was 2,338, as against 1,551 good ears on the rows where the tassels had been left, while in the former case the weight of merchantable corn was 1,078 pounds, and in the latter 710 pounds —that is, both in the number of ears and in the weight of the corn, the advantage was nearly fifty per cent. in favor of the rows where the tassels had been removed.

In the course of a lecture on "The Geographical Distribution of Plants," recently delivered before the Massachusetts Horticultural Society, Mr. H. F. Ganong, instructor in botany at Harvard University, said: "Man's influence upon the plant kingdom has been far less than it appears at first sight, and it is nearly uniformly unfavorable. The carrying of plants from place to place includes for the most part forms cultivated for food or for ornament, and the majority of them, if left to themselves in their new homes, would soon be exterminated, and hence produce no lasting effect upon plant distribution. In fact, the cases in which man has produced any considerable effect upon the vegetation or flora of a region are extremely few, and the effect is nearly always destructive. The stumps where once a forest stood speak most forcibly of man's power to destroy."

A bill to create the office of Forest Commissioner has been introduced in the Pennsylvania House of Representatives. The officer, to be appointed by the Governor, is to have practical knowledge of forestry, and by the aid of wardens employed by him he is to investigate the condition of forest-lands and have charge of those belonging to the state. He is to enforce the laws which provide punishment for the willful firing of forests, and he is to protect forests from cattle and illegal depredations, and to report annually the extent of damage by fire, cattle, etc. He is to give free information to those who ask for it as to the care of woodlands and the starting of new ones, to gather statistics of forest-products, and to post throughout the state rules for preventing and suppressing fires. The bill is approved by the Pennsylvania State Forestry Association, which is circulating petitions for its enactment, and sending out with these petitions a leaflet in which the reasons for reform in forest-policy are tersely set forth.

An article on "Dates," recently published in the *Illustrirte Gartenzeitung*, of Vienna, says that in north Africa the Date-palm is propagated by offsets, which are separated as they root and afterward planted out on the same spot. The young tree begins to bear blossoms in its fifth or sixth year, but yields fruit in no considerable quantity until a couple of seasons later, and is not in full bearing before the age of ten or twelve years. As the male and female blossoms are borne by different trees, man's help is needed to secure a crop. Hardly any but female trees are cultivated—a single male specimen serving to fructify hundreds of females. When the blooming season arrives—in February or March—and the great broad spathe of the pistillate tree unfolds, the Arab takes a bit of the staminate inflorescence, wraps it in a corner of his burnos, climbs the female tree by the aid of the step-like projections left by the leaves of its earlier years along the trunk, and ties the fragment carefully to the middle of the pistillate spathe. This is done when open flowers are first seen, and then the tree is watched until the blooming season is over, so that, as new blossoms appear, they, too, may be helped to develop fruit, the ones already treated being easily distinguished by the cords used in the tying process. Good judgment must, however, be exercised, especially in the most favorable years, for, if too many flower-clusters are encouraged to develop, the quality of the fruit will be injured. If the owner of a female tree or orchard does not possess a male specimen, he may buy the inflorescence he needs in the market-place, where it sells at a franc or a franc and a half. The harvest begins in October or November, and the fruit is plucked before it is quite mature and allowed to ripen in store-houses, as the nocturnal cold would injure its flavor, the thermometer often sinking at night to zero Centigrade, while during the day it may rise as high as thirty degrees. "Date-bread" is made from the fresh fruit which, freed of the kernels, is compressed into a block so hard that it may be cut like a ham, other fruits, such as Pistachio-nuts and almonds, being often mixed with the dates. This bread is a very nourishing article of food, and very palatable when eaten with ordinary bread. Syrup called "date-honey" is also made by pressure from the fresh fruit; from this syrup a sort of brandy is distilled; and the kernels, when first roasted and then boiled, yield an agreeable drink that is called "Gusmado-coffee."

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The Western Arbor-vitæ.

THIS tree has played its part in the exciting drama of early American transcontinental exploration. The little band of travelers under the command of Captains Lewis and Clark, after a long winter passed in the country of the Mandans on the waters of the upper Missouri, left their dreary camp in April, 1805, and pushed on into the vague and mysterious regions which still separated them from the shores of the Pacific, to reach which they had left their homes in the east a year before. The mountain barrier which divides the waters of the Atlantic from those of the Pacific was overcome with comparatively little trouble or hardship, for the pass by which they crossed and which still bears the names of the leaders of the party is one of the lowest and most easily approached of all the natural highways which penetrate the continental divide. But when this was passed, they entered into a region of mighty mountains and of deep and swift-running rivers bordered by forests, through which, except along the rare hunting-trails of the Indians, travel was made almost impossible by fallen timber larger than they had ever encountered before. Here trees were seen which were new to them—a great Spruce, with something of the appearance of a Hemlock, but vastly larger than any Hemlock of the east, and unknown Pines and Firs and many unfamiliar shrubs and flowers, and the Arbor-vitæ, which only caused comment from its great and unusual size, for they did not realize that they had found the giant of its race any more than they realized that the Larch-tree, which they soon met with in great numbers, was not the Larch of the eastern states, but a species which they were the first white men to look upon. The Arbor-vitæ interested them, for in its tall trunks they saw possible relief from the hardships of their daily struggle with the unrelenting forces of the wilderness. It was not, however, until the end of September, the men being worn out with fatigue and hunger, that their leaders determined to abandon their animals and entrust themselves to the rapid and uncertain currents of the river. On that day, having found a grove of Arbor-vitæ of proper size and at a convenient distance from one of the tributaries of the upper Columbia, they proceeded to make five canoes, which on the 10th of October, so industriously did they labor, were ready for use, and which, after many dangers had been overcome, floated the men who first crossed North America to the shores of the Pacific.

Lewis and Clark saw the western Arbor-vitæ at the extreme eastern limits of its distribution; it had, however, been seen a few years earlier on the coast of Alaska and of Puget Sound by Vancouver at the time of his Pacific voyage, and his naturalist and physician, Menzies, had carried a few leaves back to England. It was not, however, until several years later, or about 1820, that it was properly distinguished and described. It was Thomas Nuttall, to whom Weyth brought specimens from the Flat Head River, who gave to this tree the name of *Thuya gigantea*. The name was well chosen. In a region of great trees, of Sequoias, of Sugar Pines and of Douglas Firs, the western Arbor-vitæ holds its own for bigness, sending up a mighty shaft free of limbs for perhaps a hundred feet from an enormous enlarged base tapering gradually, until at twice the height of a man from the ground its diameter may not be more than a dozen feet. Beside this giant, the other Arbor-vitæs of the world appear like pigmies. There are not many of them now, although once they or their ancestors occupied a more important place in the forests of the world than they do at present. The type of the genus, the familiar Arbor-vitæ, inhabits the northern and mountainous parts of eastern America; *Thuya gigantea* occupies similar positions on the Pacific side of the continent; one species, very similar in all the details of its structure to the Pacific tree, occurs in Japan, and another, which is often called Biota instead of Thuya, having been considered at one time sufficiently distinct from our Arbor-vitæ to constitute a genus by itself, belongs in China.

Thuya gigantea is one of the most beautiful trees of the American forest, and in cultivation it is not surpassed, in its young state, at least, by any tree of its class. Economically it is of great importance. Lewis and Clark learned the value of its trunks for canoes from the Indians, who used no other tree for this purpose in all the region where it is found; and it is from the western Arbor-vitæ that the great canoes which astonished the early travelers in Alaska were hewn. The inner bark was used by the Indians for food, and cut into long strips it served to hide their nakedness. The color of the wood, which is dull red, has caused this tree to be called almost universally in the north-west "Red Cedar" from its fancied resemblance probably to the so-called Red Cedar of the east. The wood is very valuable; it is light, soft and easily worked, and so durable in contact with the ground, or when exposed to the elements, that no one has ever known it long enough to see it decay. It furnishes admirable material for the interior and exterior finish of buildings, for fences and for cooperage, and especially for shingles, which are not inferior to those made from any other wood, and which are now sent in large quantities, and of unusually large size, to all parts of the country.

Thuya gigantea, unfortunately, is not hardy in the eastern states, and, like many of the trees of the Pacific forests, it cannot be used to beautify and enrich our plantations. In Europe, however, where it was first planted many years ago, especially in England and in some parts of France, it has grown rapidly and vigorously, and promises to be a useful as well as an ornamental tree.

There has been more or less confusion among cultivators in Europe with regard to the name of the western Arbor-vitæ, and this confusion serves to show the hold on life a mistake of this sort has when it has once been made, and how hopeless are the efforts of scientific men to correct popular errors. There are two of these Thuya-like trees in western America; both are giants and both are beautiful and desirable trees in cultivation. One is *Thuya gigantea*, and the other is *Libocedrus decurrens*, a

tree with something of the habit of a Thuya, but very distinct in all botanical characters, and much more southern in its range. The Thuya was described first by Nuttall; Don, in ignorance of Nuttall's earlier description, described it again as *Thuya plicata*. Then Carrière, taking up a manuscript name of Douglas, called it *Thuya Menziesii*; and so, having to dispose of Nuttall's name of *Thuya gigantea*, and knowing only one Arbor-vitæ from the region, applied it to the Libocedrus, which had been regularly named before by Torrey. For some reason or other Carrière's names have held among cultivators; and when one buys from a European nursery a plant called *Thuya gigantea* he is sure to get *Libocedrus decurrens*, while the true *Thuya gigantea* appears variously as *Thuya plicata* or *Thuya Lobbii*, so called from the collector Lobb, who sent home seeds of this tree to England long after it was in cultivation there, sometimes as *Thuya Menziesii* and as *Libocedrus decurrens*. This transposition of names has been pointed out before, and the synonymy of these trees is fully and correctly displayed in most of the recognized works on conifers; and occasionally the two plants are labeled correctly in European botanic gardens. The correction does not penetrate deeply, and *Thuya gigantea* will continue to be known, no doubt, as *Libocedrus decurrens* in most European gardens and arboretums until Wellingtonia fades into Sequoia.

Some idea of the massiveness and beauty of a trunk of the western Arbor-vitæ can be obtained from the illustration which appears on page 116, although no illustration can give any idea of the beauty of the coloring of the bark, which is one of the chief attractions of this noble tree. The illustration, from a photograph by Notman, represents a tree of medium size in the natural park recently acquired by the new city of Vancouver, in British Columbia, which has already been described in this journal.

How to Begin Reform in Forest-management.

THE Maine State Forestry Association held a meeting in Augusta last week to consider the forest-interest of that state and suggest appropriate legislation on the subject. Mr. B. E. Fernow, Chief of the Division of Forestry in the Department of Agriculture, was invited to be present, but, being unable to attend, sent a letter to Hon. James E. Hobbs, President of the Association, from which we are allowed to make the following extracts:

What the forestry interests of Maine need above all things is the diffusion of more knowledge as to the true value as a resource, and the real nature of the forest, and as to the means and methods of its satisfactory reproduction. Next it needs such protection against fire as that knowledge would at once command, and a civilized community ought not to withhold from any kind of property.

Whatever measures you may propose to meet these needs, I warn you against urging any legislation without proper and adequate means of carrying it into execution. Too many ineffective laws have already been enacted in all the states with regard to this and other interests, much to the detriment of the cause which they were intended to benefit. It is not an easy matter to propose practicable measures for forest-protection as long as forest-property is all held in private hands. Hence it is good policy to proceed slowly until some practicable remedy is proposed and embodied in legislation, when full and proper means to carry out the law should be strenuously insisted upon. A half-hearted execution of the law is certain to retard healthy development of the forestry movement.

I have advocated, and I would advocate now, that the best first step to be taken by any state is to employ a forest-commissioner, whose business it would be to gain the needed knowledge of forest-conditions in his state, and then act upon his proposals for legislation which are based upon this knowledge. His very name and existence, if he be the right man, would stimulate the citizens of the state to study the questions involved, to form an opinion, and to aid in abolishing abuses and improving conditions. He should be in sympathy with the owners of woodlands, and especially with the lumbermen, with whose co-operation alone forest-legislation can be successfully accomplished.

From the legislation of other states in the Union but little can be learned that is very effective. On the other hand, the plan of the Canadian Government, in Ontario, for the protection against fire, may suggest some measures that could be adopted in Maine. Briefly, its provisions are that the Government appoints fire-wardens, at the recommendation of the lumbermen, to act during the dangerous season, preventing and putting out fires and instructing the people in regard to the fire laws. The Government pays one-half, the lumbermen the other half of the expense. The result has been satisfactory to both parties.

I invite especial attention, however, to the fact that the Commissioner of Crown Lands and his office have charge of this service, and that in Maine also somebody, like the proposed forest-commissioner, must be directly responsible and charged with this duty, if it is to be effective. Paper legislation, without a special officer to enforce it, is not likely to put out or prevent fires.

Castiglioni's Travels in the United States.

THIS work* has received so little attention from writers on American botany that a brief notice of the book and its author may be of some interest to those curious in the earlier literature of our plants.

Luigi Castiglioni, a descendant from the ancient and illustrious Milanese family of that name, was born shortly after the middle of the last century, and died in 1832. The various honorable offices held by him during his life, and the distinguished titles conferred upon him, bear witness to his active interest in the affairs of his day.† He was Director of the Royal Mint, President of the Academy of Fine Arts of Milan, Senator of the Kingdom of Italy, Chamberlain of the Emperor of Austria, Chevalier of S. Stefano, P. M., and of the Iron Crown, and a member of many learned societies, including the American Philosophical Society of Philadelphia. He was a devoted student of numismatics and the possessor of a famous collection of Italian coins. Early in life he became much interested in sylviculture, and with his brother, Count Alfonso, afterward associated with him in the authorship of a work on foreign plants useful in medicine and the arts, was instrumental in introducing many valuable trees into northern Italy. In recognition of his botanical attainments a genus of plants was dedicated to him by the Spanish authors Ruiz and Pavon, but, the genus not being well founded, the name has since become a synonym.

In 1785 he visited this country, moved, as he tells us, by curiosity to witness the political birth of a republic composed of distinct nations extending over a vast area, and by the desire to study the natural productions of the land, particularly those of the vegetable kingdom, with the view of introducing the more useful ones to his native Lombardy. He passed three years in traveling through the thirteen states and a portion of Canada, and the result of his observations was published in 1790, shortly after his return to Milan.

The main portion of the book consists of a narrative of his travels, with extended comments on the histories and governments of the states, with notes on the manners and customs of the people and on the natural productions of the country. It is followed by an appendix entitled "Observations on the Most Useful Plants of the United States," in which almost all our common trees and shrubs, and some of the more interesting herbs, are described in alphabetical order after the manner of Marshall's Arbustum. This appendix is accompanied by three plates.

That the author was well qualified for the task his judicious observations on the social and political condition of the young republic, and his careful notes on its geography and natural history, abundantly testify. Though not of the importance to systematic botany that the works of his predecessors, Wangenheim and Marshall, proved to be, his account of our trees and shrubs is in other respects by far the most interesting that had appeared up to that time. As an instance of his sagacity, it is worthy of remark that he distinctly notes and repeatedly insists upon the affinities of our plants with those of Japan and China, a subject which has since played so important a part in the philosophical consideration of the two floras. In vol. ii., p. 156, he says: "It is moreover to be observed that the plants are very similar to those of the eastern coast of northern Asia, the Magnolia, Illicium, Calycanthus, Ginseng and many others, for example, growing here as in Japan and China, thus confirming the assertion of Franklin that the eastern coasts of the old and new continents bear much analogy in their climates,"

* "Viaggio negli Stati Uniti dell'America Settentrionale fatto negli anni 1785, 1786 e 1787 da Luigi Castiglioni. Con alcune Osservazioni sui Vegetabili più utile di quel Paese." Two volumes, 8vo. Milano, 1790.

† See Litta, "Famiglie Celebri di Italia."

and in a foot-note he refers his readers for further proof of this to a comparison of Thunberg's "Flora Japonica" with the "Flora Virginica" of Gronovius. Again, in his account of the Catalpa, p. 212, he remarks: "This is one of the plants common to the eastern coasts of America and Asia which prove the analogy of the two climates."

The three plates give good figures of the Franklinia, made undoubtedly from the specimen in Bartram's Garden, the Poison Sumach and the Bear Oak, though I cannot find that they have ever been cited.

It may be added that the simple grace of his style makes Castiglioni's work one of the most readable of the early contributions to our botanical literature, and it deserves to be known to all lovers of our plants acquainted with his language. It has been so strangely neglected, however, that many to whom the book would be of interest are perhaps ignorant of its very existence, and it may be doing some service, therefore, to call attention to the fact that "the story is extant and written in very choice Italian."

Jamaica Plain, Mass. *C. E. Faxon.*

The Sleepy Grass.

IN contributions from the *United States National Herbarium* (No. 2, issued June 28th, 1890), Dr. Vasey describes *Stipa viridula*, Trin., var. *robusta:* A stout, leafy, densely tufted grass, four to six feet high, growing in thick clumps, with broad and loose sheaths longer than the internodes, and flat, wide blades often two feet long. Dr. Vasey informs me that it is very common in New Mexico, reaching northward through Colorado, probably to the hilly parts of South Dakota. Southward it extends through Texas into Mexico.

In 1879 Dr. Palmer collected this plant in Coahuila, Mexico. He noted that it was considered poisonous to cattle, horses and sheep, having a temporary narcotic effect upon them, and that it was only eaten by strange animals, being shunned by the native animals which have once experienced its effects (*Bull. Torrey Bot. Club*, xiv., 99). Dr. Vasey also noticed that it was not eaten by cattle during the summer, being eaten only under stress of hunger in winter or spring.

In 1888 I received a letter from my friend Dr. M. E. Taylor, of the army, then stationed at Fort Stanton, New Mexico, which I quote in parts: "Hereabout grows a grass . . . the eating of which by horses will, within a few hours, produce profound sleep or stupor, lasting twenty-four or forty-eight hours, when the animals rally and give no evidence of bad effect. It is known among cowboys as 'Sleepy Grass,' and dreaded by them on their 'rounds up,' as their horses are liable to eat it, and cannot then be kept up with the herds. . . . The tradition is that horses having once eaten of it will not touch it again."

This letter was accompanied by another from Mr. J. E. Cree, a stock raiser, whose ranch is near Fort Stanton. From this letter, addressed to Dr. Taylor, I also quote in parts: "The Sleepy Grass invariably grows in the immediate proximity of water, and where the ground is no doubt sub-irrigated. I have never known cattle to suffer. . . . Happening to be with our 'round up' this spring, we camped at Three Bear Springs. That night, although our foreman took precautions to guard against any of our horses getting the grass, we found in the morning that three or four had succeeded. Out of this number it seemed as though one would succumb altogether. He would stand in one position for hours at a time, his head swaying backward and forward as if asleep, and, if I remember correctly, was trembling all over. It appeared to very strangely affect his kidneys, as he had an unceasing desire to pass urine. . . . It was fully seven days before he recovered, and was then weak and drawn. One of the other horses seemed to be all right on the start, but before long it became evident he was also suffering from the effects of the Sleepy Grass, and it was only by a free use of the spurs that he could be made to move along. His recovery was much quicker. . . . I may mention that we have not found a horse that has once suffered ever again to eat it. We had a number of 'Bronchos' this year, and while under its influence one could walk up and catch them. Whether a sedative can be procured from this grass or not, I venture to suggest that some valuable extract affecting the kidneys may be obtained from it."

From the same gentleman I received a letter in 1890, in which he says: "Since I corresponded with Dr. Taylor it has been brought to my notice that cattle are affected in a similar way to horses, and that the curious properties which so affect animals are contained in the blades. Quite a number of our horses have been ill this spring after having eaten it. It usually takes them about a week to recover, during which time they are unfit for work, and specially so during the first three days."

Captain Kingsbury, of the Sixth United States Cavalry, under date of March, 1890, wrote me from Fort Stanton that "the Sleepy Grass affected nearly all my horses at two camping places. It was hard work to make them walk."

A specimen of the grass in question was received from Fort Stanton and submitted to Dr. Vasey, who identified it as his *Stipa viridula*, var. *robusta*.

The similarity of symptoms, whether observed in Coahuila or in New Mexico, is certainly remarkable, and furnishes strong evidence of the substantial accuracy of the observations as reported. It would seem, then, reasonably established that this plant possesses narcotic or sedative properties, affecting principally horses, but also cattle and probably other animals; that animals are not fond of it, but eat it inadvertently or when under stress of hunger; that cases of poisoning occur specially in the spring, when the radical and lower blades first come up, and that the active principle resides in these blades, and perhaps only during that season.

Now let us turn to the species itself, *Stipa viridula*. It is a western grass, abundant beyond the Great Lakes and from British America southward to Colorado. It appears to be common in Oregon and California. It is considered a good pasture and hay-grass by stockmen, both foliage and seed-tops being much liked by cattle. In good land, specially if moist or irrigated, it attains a height of three feet or more and yields excellent hay. Being widely diffused it furnishes a considerable part of the wild forage of the Rocky Mountain-region. This plant has never been accused, so far as I can ascertain, of containing any deleterious principle or of giving rise to any unpleasant symptoms; it is such a common constituent of pastures and hay, and so extensively consumed, that it is not possible it should possess any deleterious properties without attention having been called to it. Here we are, therefore, in presence of a botanical variety possessing marked properties which are absent in the species, an occurrence which, I am inclined to believe, is quite rare among native plants, and might, perhaps, be used as an argument for raising the variety to the dignity of specific rank.

There are some twenty-two species of Stipa in North America. Outside of *S. viridula* few possess economic importance. *S. spartea*, according to Professor Macoun, is the "Northern Buffalo Grass" of the Canadian ranchmen; it "constituted the winter food of the buffalo, and is now the delight of horses in the winter season." In other parts, this species, as well as *S. comata*, under the name of Porcupine Grass, is considered a great nuisance by stock raisers on account of the sharp-pointed and barbed callus which penetrates the flesh of sheep and other animals. *S. occidentalis*, *S. setigera* and *S. pennata*, var. *Neo-Mexicana*, are also mentioned as desirable elements of pastures or as sometimes furnishing hay. None of these, so far as known, possess narcotic or other unusual properties.

Fort Buford, N. Dak. *V. Havard.*

Can the Gypsy Moth be Exterminated?

THE recent action of the Governor of Massachusetts in dismissing the original Gypsy Moth Commission as inexpedient and incompetent, and the appointment of a new commission without remuneration selected from members of the State Board of Agriculture, and to be under its direction, once more brings into prominence the question of the war against this now notorious insect. It seems probable that the commissioners appointed last spring were named rather on account of their political capacity than their entomological knowledge, since not one of them even knew the nature and habits of the insect with the extermination of which they had been entrusted. The advice of entomologists, given gratuitously when asked for, probably prevented some serious blunders. The large sum voted by the Legislature gave ample means for prosecuting the work, and the results arrived at in reducing the pest last season were better than many people anticipated and as good as was to be expected from inexperienced and more or less careless management.

Land-owners naturally made much complaint and opposition to the invasion of their grounds by employees of the Commission for the purpose of searching for the cocoons of the Gypsy Moth, or more particularly for the application of insecticides (chiefly arsenical) to trees, shrubs and other vegetation. The act establishing the Commission gave it power to invade any private place in furthering its object, and the ignorant workmen employed were in many cases apparently very careless in the use of the Paris Green and indifferent as to the thoroughness of their work.

Late in the season an attempt at some sort of quarantine inspection was inaugurated with the idea of preventing the spread of the insect from one town to another. While teams on roadways were examined, at certain points the inspection seemed to be of the most superficial nature, and it does not appear that such modes of conveyance as railroad trains or river boats received any attention.

It is now generally conceded that it must be fully twenty years since the insect was first unwittingly introduced by Mr. Trouvelot while making experiments in silk-culture near Medford. During that time it has been increasing in numbers and annually spreading over a larger area; and in some localities it was noticed as quite injurious during at least two seasons before it came to the notice of entomologists or received official attention. This being the case, the question naturally arises as to how far beyond the present known limits of forty or fifty square miles and in what directions the insect may have been transported during all the years in which its existence was ignored. Whether or not its extermination, which was plainly contemplated by the legislature, can be accomplished, depends largely upon the area over which it has been distributed. If it does not exist in this country outside of the limits where it is now known the task might not be easy, but it would be much simplified.

That the pest may be in other places undetected may readily be supposed, since it has escaped the notice of the numerous naturalists of Boston and vicinity for so many years. Some of the most infested localities were about large manufacturing places, where freight-cars remain for days or weeks while loading or unloading. The habits of the insect are such that there seems every reason to believe that, in the last years preceding its discovery, it has been carried in one or another of its stages with freight to distant points, where, if the conditions were favorable, it is now on the increase, although its presence may not be observed for years. It might be worth while for the Commission to find out some of the places to which car-loads or empty cars have been most frequently dispatched from the infested district in recent years, and to have competent persons visit these places to ascertain whether the pest is there. While there is not the least evidence that it has spread beyond the area now known to be infested, the chances of the pest having been carried far beyond should not be lost sight of. If it is found to have gained a foothold elsewhere, an opportunity would be given for checking it before it becomes as alarmingly abundant as it did at Medford and surrounding towns.

Its advent within the borders of other states would make it a national rather than a state care, but it is questionable whether further special legislation would be advisable except for the enactment or enforcement of such laws as would compel every landowner to keep his property reasonably clear of such pests, so that they would not be a menace to the rest of the community.

To many persons it seems that the prospect for the extermination of the Gypsy Moth is not very hopeful; and from its habits, known distribution and the means that have been thus far taken for its subjection, one can hardly see how its extermination in this country is now practicable, even with the aid of larger appropriations than the legislatures could be prevailed upon to give.

The appropriation and expenditure of the $50,000 already voted, however, will not have been altogether in vain; for, besides the accomplished temporary suppression of the pest, a wide-spread popular interest in entomology has been aroused, and the value of a knowledge of such things has been once more very effectually and practically demonstrated to those who usually belittle such studies. Besides this, the folly and waste of allowing political and personal motives to control appointments in matters of this nature has had one more illustration, if, indeed, any more was needed.

The now famous work, carried on under the direction of Dr. Riley, in overcoming the Cottony Cushion or Fluted Scale in California by the importation of the predaceous Lady-bird beetle (*Vedalia cardinalis*) from Australia, very naturally has led to the inquiry whether there are predaceous or parasitic foes of the Gypsy Moth which could be introduced to keep it in check in this country if the project of extermination should be abandoned. In Europe over a dozen parasites of the Gypsy Moth are known which are the chief preventives of the undue increase of the pest. Owing to circumstances unfavorable to their enemies, the Gypsy Moths are occasionally very abundant and their larvæ exceedingly destructive to vegetation in some parts of Europe.

They are rarely or never so destructive, however, as another closely related insect, *Liparis monacha*, popularly known as the "Nonnen" in Germany, the advent of which would be a much greater evil to this country. The ravages of the "Nonnen" in European coniferous forests have been recognized for hundreds of years, and the serious destruction caused in Bavaria last season showed that it was almost as hopeless to make a fight against this foe to-day as it was two centuries ago. Its extreme abundance and destructiveness is of only occasional occurrence, the numbers fluctuating remarkably from year to year. It frequently happens that insects of this destructive class are almost annihilated by epidemics of fungal or bacterial diseases, the causes and conditions of the development of which are not yet well known. With a better knowledge of them, it is possible that such diseases may at some future time play an important part in the struggle against destructive insects.

The new Commission appointed to prosecute the work against the Gypsy Moth may be depended upon to carry it on in the best and most disinterested manner possible, for although none of the appointees of Governor Russell are known as entomologists, they are men of such wide intelligence that they are certain to solicit and take advice from the very best authorities as to the possibility of extermination, the benefit likely to be derived from the importation of the foes of the pest and the best means and methods of carrying out the intent of the law.

Arnold Arboretum. *J. G. Jack.*

New or Little Known Plants.

New Orchids.

Cypripedium × "Muriel Hollington," Rolfe.—This is a charming little hybrid, raised from *Cypripedium niveum* fertilized with the pollen of *C. insigne*, in the collection of A. J. Hollington, of Enfield. It received an award of merit from the Royal Horticultural Society on November 11th last. As in the case of all hybrids raised from *C. niveum*, the characters of that species largely preponderate, but the spots and especially the folded apex of the dorsal sepal, the nerves of the petals, and the leaves, are all modified in the direction of *C. insigne*. The flower is white, with the lip, petals and dorsal sepal beautifully veined with light purple, the latter organ having a yellowish green disc.—*Gardeners' Chronicle*, January 3d, 1891, p. 10.

Cypripedium × Castleanum, Rolfe, is a beautiful hybrid, raised in the collection of Messrs. F. Sander & Co., of St. Albans, from *C. hirsutissimum* fertilized with the pollen of *C. superbiens*. It somewhat resembles *C.* × *Fraseri*, raised from the first-named species crossed with *C. barbatum*, but is more brightly colored. The characters of the pollen parent somewhat preponderate, but the colors are darker than would naturally have been expected.—*Gardeners' Chronicle*, January 10th, 1891, p. 30.

Cypripedium × Orpheus, Rolfe, is a pretty hybrid, raised in the collection of Messrs. F. Sander & Co., of St. Albans, from *C. venustum* fertilized with the pollen of *C. callosum*. It strongly resembles the last-named species in character, but the dorsal sepal is smaller, more acute, and without the purple veins, and the petals more purple toward the apex, and with fewer warts on the margin, in which respect it approaches the seed-bearing species. It is the first hybrid raised from *C. callossum.*—*Gardeners' Chronicle*, January 10th, 1891, p. 39.

Cypripedium × Alcides, Rolfe, is a large and delicately-colored hybrid, raised in the collection of Messrs. F. Sander & Co., of St. Albans, from *C. insigne* fertilized with the pollen of *C. hirsutissimum*. It is tolerably intermediate in character, though the influence of the pollen parent decidedly preponderates in the shape of the dorsal sepal, petals and lip. The colors are more delicate than would *à priori* have been expected.—*Gardeners' Chronicle*, January 10th, 1891, p. 40.

Kew. *R. A. Rolfe.*

Plant Notes.

Some Recent Portraits.

Sir Joseph Hooker describes, in the February number of the *Botanical Magazine*, a new Magnolia (t. 7157) from Japan, for which he proposes the name of *Magnolia Watsoni*, in honor of Mr. William Watson, our London correspondent and the assistant curator of the Royal Gardens. *Magnolia Watsoni* is described as a small tree, flowering at the time of the unfolding of the leaves, which are four to seven inches long by two to three and a half inches broad, elliptical or obovate-oblong, obtuse or cuspidate, deep green above with yellow margins and nerves, paler, and, when young, clothed on the

lower surface with fine silky appressed hairs. The flowers are solitary, very short-peduncled, and five or six inches in diameter, and remarkable in the broad ring of blood-red filaments which surrounds the pistil. This tree was purchased by the authorities of the Royal Gardens from the Japanese Court of the Paris Exhibition in 1889, and it flowered at Kew in the open ground last year. The flowers are described as possessing a powerful odor, like those of the Calycanthus. This, we suspect, is the plant which Mr. Thomas Hogg introduced into the Parsons' Nursery at Flushing many years ago, where it has proved perfectly hardy. He found it in the mountains of Japan and considered it a mountain form of *M. parviflora*, and it is under this designation that it has been grown and distributed from Flushing, where it flowers every year and has occasionally produced fruit. It is probably distinct from *M. parviflora*, as Sir Joseph Hooker points out, differing from that species in its much larger foliage and in its larger short-stalked flowers. A drawing was made in the Parsons' Nursery some years ago for GARDEN AND FOREST, but has been held in the hope that a figure of the fruit, which is not obtainable every year, might be added to make it complete. The yellow margins of the leaves of the Kew plant are possibly abnormal, as, judging from the source whence it was obtained, the specimen is probably of garden origin.

Other figures in the same number of the *Botanical Magazine* are: *Catacetum fimbriatum* (t. 7158), a showy Brazilian Orchid long known in gardens, having been exhibited at Brussels as long ago as 1848; *Rhododendron scabrifolium* (t. 7159), one of the numerous Rhododendrons recently discovered in western China by the Abbé Delavay, chiefly from the mountains of Yun-nan, which the present species inhabits at an elevation of 8,000 feet above the sea-level. It is a small rigid shrub, hairy all over, with the exception of the bracts, corolla, stamens and style. The leaves are two and a half to three and a half inches long, elliptical or oblong-lanceolate and acute at both ends. The flowers are borne in loose terminal subumbellate fascicles on long slender pedicels surrounded at the base by pubescent yellowish bracts. The corolla is an inch and a half in diameter, and is white, flushed with pink, with a short campanulate tube. The species is rather interesting than beautiful from a garden point of view. *Tricuspidaria dependens* (t. 7160), a small Chilian tree of the Linden family, widely distributed through ten degrees of latitude. It produces handsome pendulous, blood-red flowers an inch and a quarter long, hanging from the axils of the new leaves. *Angræcum fragrans* (t. 7161), an Orchid chiefly interesting for the persistent vanilla-like odor of the dried leaves, which has caused them to be used as tea in Bourbon, the Mauritius, and even to some extent in France, where it is considered digestible, and recommended in diseases of the respiratory organs.

Cultural Department.

The Genus Cycas.

OF the nine genera into which the order *Cycadaceæ* is now divided the genus Cycas is the only one which finds general favor in horticulture. *C. revoluta* is universally popular as a decorative plant; it is also a conspicuous feature in elaborate flower arrangements, especially for funeral occasions in Germany and several other continental countries. In England it is generally grown for the conservatory. It is perhaps the hardiest of all Cycads, and its beautifully glossy green, plume-like leaves are as durable as the leaves of any plant.

It is a native of China, from whence it is said to have been introduced into Europe by Thunberg in 1737. Its trunk sometimes attains a considerable height, as is shown by a specimen in the Kew museum, which is ten feet high. A living plant in the winter garden has a stem six feet high. As a rule, however, before the trunks get to this height they sprout all over their sides and base and break up into numerous heads. Large examples of both the female and male plants are in the Kew collection. The female is common in gardens, and when in flower its central, nest-like cluster of stunted, brown, felt-covered fronds, bearing each three or four orange-colored, egg-like fruits, is both attractive and interesting. The male plant, however, is exceedingly rare. The Kew examples were obtained after much trouble from Shanghai in 1884. The cones are erect, pine-like, and each stem is said to produce three cones at once.

Next in popularity to *C. revoluta* comes *C. circinalis*, which appears to be common in the tropics of Asia, and which has been known in English gardens since the year 1700, when it was introduced by the Earl of Clarendon.

Dr. Trimen states that it is abundant in Ceylon, where its trunk often grows to a height of from fifteen to twenty feet, and is sometimes branched. Some fine trunks were sent from Ceylon to the Colonial and Indian Exhibition held in London in 1886, of which several are now at Kew. One of these is a particularly handsome specimen. Its trunk is eight feet high and fifteen inches wide at the base. The spread of its foliage is eleven feet through, each frond being six feet long, eighteen inches wide, with the pinnæ a foot long, arched, and five-eighths of an inch wide.

C. Rumphii is very similar to *C. circinalis*, as also are *C. Celebica* and *C. Thouarsii*. This last is the only Cycas represented in Africa, where it was found by Kirk on the Zambesi. Dr. Gappy states that he saw in an island in Bougainville Straits a Cycas, probably *C. Rumphii*, "with a stem forty-five feet high, growing solitary in a plantation." This is by far the tallest Cycad I have ever heard of. The largest specimen of *C. Rumphii* at Kew is a particularly fine one. Its stem is less than three feet high by seven inches in diameter at the base, but it carries a head of forty leaves, each six feet long and eighteen inches wide, the pinnæ falcate, fourteen inches long by half an inch in width. I have seen a picture of a plant of *C. Rumphii* in Calcutta, with no less than fourteen heads of leaves and a cone in the centre of every head.

C. undulata of gardens may be *C. Sumannii*, a native of Fiji, and not unlike *C. circinalis*, except that the pinnæ are slightly wavy at the margins.

C. Riumininiana is a most elegant species and a very rare one. The Kew plant has a stem eighteen inches high by four in diameter, twelve leaves, each four feet long, the pinnæ narrow, thin in texture, half an inch wide, and of a bright, glossy green. The fronds are almost as elegant as the leaves of a Cocos. This rare plant was introduced from the Philippines by Mr. W. Bull some twelve years ago.

C. Siamensis is almost as largely grown in France as *C. revoluta* is here. This is partly due to the fact that it is common in Siam and Cochin China, from whence it was introduced in quantity into France about ten years ago. It has large stems, often seven feet high, much swollen at the base; elegant bright green fronds about four feet long, and pinnæ nine inches long. It is supposed to be sufficiently hardy to bear as low a temperature as *C. revoluta*. At Kew, however, it is grown in a stove, having failed in the large temperate house. I do not see how *C. gracilis*, var. *viridis*, of Van Houtte, *C. pluma* of Ball, and *C. Boddamii* of Dyer differ from *C. Siamensis*.

C. pectinata.—This is the handsomest of all Cycas. It is not, however, as easily grown as the better-known species, as it requires a stove temperature, with plenty of sunlight and moisture. Even then its fronds, magnificent though they are when at their best, suffer considerably in winter, and are rarely fit to remain on the plant a second year. The plant represented in the illustration (page 114) was grown at Kew over the tank devoted to *Victoria Regia*. It was in a ten-inch pot, had a stem a foot high, conical in shape, and leaves eight feet long, rich green in color, and as elegant as an ostrich plume. This species is easily distinguished from all others by its semi-erect, arching fronds and by its thin, blunt-tipped, long, falcate pinnæ. It is a native of Sikkim. Sir Joseph Hooker found it in Great Rungeet Valley in 1848, and a sketch of it made by him on the spot shows it with a stout stem at least twelve feet high. The fruit of this species is as large as a Golden Drop plum, and as richly colored when ripe. The male cone is exceptionally large and handsome, being nearly twenty inches long by six inches in diameter, tapering to both ends. It is formed of fleshy, closely packed, overlapping scales, each tipped with a macron nearly two inches long. *C. Jenkinsiana* of Griffith appears to be the same as this.

There are several Australian species of Cycas which are represented only in few collections at present, but which when better known and more plentiful are certain to find favor. They are quite as elegant in foliage as and at the same time distinct from the other species mentioned. The best-known is *C. media*, which is not unlike *C. Siamensis*, and of which Mr. Bull used to have some very fine specimens: *C. Kennedyana*, *C. Cairnsiana* and *C. Normanbyana*.

The most famous collections of Cycads are those at Kew, Herrenhausen (Hanover), Potsdam and St. Petersburg. Mr. Bull has also a good many species; indeed, he is the only English nurseryman who possesses a representative collection of these plants. In massiveness and grandeur the Cycads are not surpassed even by Palms, while many of them are so easily kept healthy that it seems almost difficult to harm them.

The cultural requirements of Cycases do not differ materially from those of the order generally. They do not require

much root-room, but they like a rich open soil, plenty of water when growing, and a little extra food in the shape of liquid manure helps them considerably in the growing season. While some of the species, such as *C. revoluta* and *C. circinalis*, retain their leaves several years and scarcely turn a hair in winter, others are practically deciduous. When the fronds sicken it is wise to keep the roots fairly dry, so as to rest the plants. This usually happens in winter, but by March again new leaves will push up, and these should be encouraged by gentle syringing in favorable weather and an occasional good watering at the roots. Should the stems decay at the base they may be cut off above the decayed part and treated as cuttings. Quite large stems, both of Cycas and other genera, have been renovated in this manner. It sometimes happens that after fruiting a stem will decay at the top, and appear to lose entirely its central bud. Cycads, however, are not like Palms in this respect, for I have seen new growths start from the top of stems which apparently had previously lost everything down to the pith. Should the central bud fail to start again then laterals will almost certainly push out, or even all round the base of the stem just above the roots numerous sucker-like growths will spring up. In fact, one might say that if there is health in even a small portion of the stem of a Cycad there is a chance of its revival. Cycas differs from other genera of *Cycadaceæ* in having a conspicuous midrib extending up the whole length of the pinnæ. Stangeria is the only other genus with this character, but it differs very markedly from Cycas in all other respects.

Kew. *W. Watson.*

Fig. 22.—Cycas pectinata.—See page 113.

Hardy Plant Novelties.

THE season of seed catalogues has fairly begun, and those who study this literature always find something to interest and instruct, and, probably, to perplex, them in the effort to discriminate between desirable novelties and those which are quite as well left alone. It would appear that we are to become better acquainted in future than we have been with the treasures of the New Zealand flora. One of these, *Ranunculus Lyallii*, is now offered by several seedsmen, and if there was but a reasonable hope that seeds of this beautiful plant would germinate easily we should soon be in possession of a good stock. *R. Lyallii* is known as the Shepherd's Lily in its native country, which is in the southern or colder of the two islands known as New Zealand. Some time ago I obtained fresh seeds of this plant direct from its native locality, with the date on which the seeds were collected, but at the end of two years no plants appeared, and I can only find one instance recorded of this Ranunculus having been raised from seed, and this was by Mr. Anderson Henry, of Edinburgh, Scotland. In this place the plants came at the end of three years after sowing. The flowers of *Ranunculus Lyallii* are pure waxy white, four inches in diameter, while the leaves are peltate, often fifteen inches in diameter, with a many-flowered stem two to four feet high. This plant would certainly not be hardy in the colder states, but would be desirable for the cool greenhouse.

Of other New Zealand plants the Aciphyllas are also offered as new. My experience with this genus is not extensive, being confined, in fact, to *A. squarrosa*, the Bayonet-plant, so called

on account of the sharp-pointed segments of the foliage. Four years ago a single plant was received and carefully nursed in-doors until early summer, when it was planted out with other things, but with the first heavy rains it rotted off at the ground-level, and therefore it is to be presumed that until of good size the Aciphyllas would need to be grown in-doors. If this could help them to become established, it is worth trying, as their singular appearance when in flower gives them unusual interest.

Delphinium Zalil when introduced created considerable interest on account of its being the first yellow-flowered species of Larkspur cultivation. We are now offered another species with yellow flowers in *D. Przewalskyanum*. (The secret of pronouncing this apparently impossible name is said to be the insertion of an "i" between its first two consonants.) This species, unlike *D. Zalil*, is a true perennial, perfectly hardy, and a native of central Asia.

Another remarkable plant, not new, but now first offered, is the beautiful Mexican Thistle, *Erythrolæna conspicua*. True, it is only a Thistle, but, judging from the descriptions and figures received, it must possess unusual merit. We are told that it is a biennial plant, but that when treated liberally it grows four to six feet high, much branched, with large foliage crowned with flower-heads of a bright orange-carmine color. Our seed was sown at the commencement of the year, and they are now strong plants, and grow rapidly. In the warmer states this plant would be a conspicuous one for ornamental gardening, but here it would have to be protected in winter the first year, and this detracts somewhat from its value.

We are indebted to Mr. William Thompson, of Ipswich, England, for the reintroduction of *Coreopsis grandiflora*, of Nuttall, and though this very plant has been distributed here as *C. lanceolata* in almost every state, still its identity had not been determined. It has been the subject of note in previous numbers of Garden and Forest, that there were two plants called *Coreopsis lanceolata* in cultivation here, the one vastly superior to the other, and now the better one will be known as *C. grandiflora*. It may be distinguished by the larger and brighter flower-heads and by the deeply pinnatifid leaves, the terminal lobe being much the largest. This, the true *C. grandiflora*, has a large tuft of what would be evergreen foliage in a milder climate than ours, but here it usually gets badly disfigured, although the heart of the plant winters out safely. Those who possess *C. lanceolata* would do well to examine their plants, and if they are correctly named, to get *C. grandiflora*, for both are admissible into even the most select collections, and considerable difference will be found in the duration of the flowering season of the two plants. It has been stated that *Coreopsis lanceolata* ripens seed sparingly in some seasons; this may be true, but I am very sure that Goldfinches find the seed the most palatable food they can obtain in its season, as I once discovered when trying to save a quantity of seed. They did not wait for it to ripen, but seemed to prefer it when approaching maturity, and perhaps it has been through the agency of Goldfinches that the Coreopsis is so often met with as an escape from cultivation in places where it could not otherwise have been found. Seedlings of *C. grandiflora*, if raised early and planted out in good soil, will flower nicely by the end of summer, and will make a fine display the following season.

South Lancaster, Mass. *E. O. Orpet.*

Notes from Cornell University.

Substitutes for glass of various kinds in forcing-houses are from time to time referred to in horticultural journals, but their relative efficiency does not appear to be fully settled. Some trials of these substitutes are now being made at the experiment station here. A section of the forcing-houses recently built was first covered with a strong white oiled paper. A short experience with this material, during several snow-storms and the subsequent freezing and thawing aided by the wind, was sufficient to show its inefficiency, and a cloth covering was substituted for it. The latter is cotton-sheeting of medium quality, costing $2.50 for the 350 square feet covered, and it was thoroughly oiled with raw linseed oil, both to make it more durable and more translucent. It was put on, and the first coat of oil (about three gallons) applied, by two men in a day; a second coat, requiring another gallon of oil, being added a week later.

This covering seems to accomplish all that was expected of it. It apparently retains the heat as well as the ordinary glass roof. More exact investigations, however, are to be made, both as to the loss of heat in this and in the glass houses.

Although, of course, a considerable portion of the light is cut off, the oiled cloth admits a larger amount than would be expected, and it seems from present experience that a forcing-house built in this manner, on account of its cheapness and ease of construction, would be of practical value for the propagation of many kinds of plants, and, perhaps, even for the forcing of Lettuce and some other crops.

Further experiments will be undertaken to decide these questions.

Electric Light in Horticulture.—Experiments with the electric light are showing some very interesting results this winter. One of the forcing-houses is divided by a tight board partition across the centre. Upon one side of this partition are growing a variety of plants with an electric light suspended from the roof in the midst of them. Upon the other side is a corresponding set of plants of the same varieties, growing under conditions as nearly like the first as it is possible to obtain, except that the artificial light is carefully excluded. The light has been in operation about six weeks for five to six hours each evening, except on moonlight nights, when it has run for about two hours.

The difference in growth in the two sections of the house has been very striking with some kinds of plants, especially in the case of Petunias and Lettuce. While in the lighted half of the house the Lettuce crop is now large enough to market, the average size and weight of the plants in the opposite section are but little more than half as great.

The effect upon flowers is also very marked. While the plants of Petunia, Verbena, etc., develop much more rapidly under the light, the flowers when opened last only half to two-thirds as long as in the unlighted section, and begin to bleach and fade very soon after opening.

The flowers in nearly every case turn toward the electric light, and the plants also show a similar tendency. In the winter of 1889-90, when the electric light ran continuously throughout the night, this bending of the plants toward the light was very much more marked. From all sides they reached out their slender branches toward one point, seeming to make an almost conscious appeal for more light. The whole subject is worthy of further investigation, and the experiments are to be continued with varied conditions.

While it is easy to draw hasty conclusions from a few experiments, it does not seem visionary to think it possible that in the not distant future the electric light may become an important adjunct in our large forcing-houses, especially when we consider that, as our present experience seems to show, a crop of Lettuce can be matured ten days or two weeks earlier by its use.

Ithaca, N. Y. *C. W. Mathews.*

Orchid Notes.

Angræcum sesquipedale.—This species is superior to any other Angræcum, and it must certainly be ranked among the most interesting of all Orchids. The plant was known to European botanists as early as 1822, but it was not until 1857 that it was first brought to England in a living state from Madagascar, its native country, by the Rev. William Ellis, whose explorations of this island resulted in the discovery of more than one remarkable plant. *A. sesquipedale* flowered with Mr. Ellis at Hoddesdon, Herts, during the year of its introduction. It created quite a sensation at that time; but this is not to be wondered at, for in addition to the peculiar formation of the flowers, which has always been a matter of interest to botanists, their beauty has never failed to call forth the admiration of every one. The stem of the plant is erect and thickly clad with arching, oblong leaves, about two feet long, notched at the apex, dark green, and arranged in two opposite rows. The axillary peduncles bear from one to four star-shaped, slightly fragrant, flowers of thick texture, and from six to eight inches in diameter. The sepals and petals are broad at the base and taper gradually to a point; lip ovate-acuminate, and elongated from twelve to eighteen inches at the base, thus forming a remarkable, hollow, pendent spur. When the flower first opens the parts are pale green; they all turn to creamy yellow except the spur, which retains the greenish tint; later they assume a waxy whiteness, which is maintained for several weeks, and then they turn to rich yellow before dropping. A specimen grown here presented a magnificent appearance when in bloom last February. The stem of this plant is but twelve inches in height, and it bears only a single, one-year-old branch. But, notwithstanding its small size, eleven full-sized flowers appeared at once on four peduncles. To develop this free-flowering character *A. sesquipedale* should be planted in a basket and suspended from the roof, close to the glass, on the sunny side of a house, which is kept at a stove temperature all the year. Growing Sphagnum, with ample drainage, will be found most acceptable to the roots. Although free access of light is essential at all seasons, yet, to

Fig. 23.—Thuya gigantea.—See page 109.

keep the plant healthy, bright sunshine must be excluded by shading except during the winter months. The plant advances with greater rapidity as it is farther removed from the light, and the foliage then assumes a much more luxuriant color; but this rankness of growth moderates the production of flowers to a large extent. Moist roots and a moist atmosphere are congenial to the plant at all times, but when the flowers appear the supply of water should be reduced.

Lælia superbiens.—The most famous of the early collectors of Orchids, Mr. Skinner, wrote that he discovered this plant in 1839 in Guatemala. The first specimens he had seen were cultivated by the Indians, to whom the plant was

then known as the "Red Flower." Mr. Skinner adds, that in 1840 he found the plant growing in immense quantities about twenty leagues north of the city of Guatemala; that there was hoar-frost upon the ground at the time of his visit to its native locality; and that "St. Joseph's Wand" was the name given to it by the Spanish-speaking people who dwelt there. There are now few collections of Orchids in which it does not hold a prominent place. The plant which flowered with Mrs. Wray, of Cheltenham, in 1844, was probably the first to bloom in England. *L. superbiens* is a strong-growing plant, and, under favorable conditions, soon forms a large specimen. The creeping rhizome is about half an inch in diameter, and produces pseudo-bulbs at intervals of two or three inches. The pseudo-bulbs are oblong, from nine to twelve inches in length, nearly round, tapering toward both ends, ribbed, and, when young, covered with a whitish sheathing. At the top they support one or two oblong, acuminate leaves, about their own length, very thick, and of a dark green color. The peduncles proceed from the summit of the pseudo-bulbs, and vary in height from five to nine feet. They are clothed with the silvery sheathing peculiar to the pseudo-bulbs, and bear from ten to twenty flowers in a globular cluster at the top. The flowers are from six to seven inches across, the sepals and petals spreading, lanceolate (the latter by a trifle the broader), and both of a bright rose color. The lip is as long as the sepals, three-lobed, with the lateral lobes incurved, crimson and yellow, the front lobe broad, spreading, wavy, on the margin, and deep purple with crested lines of yellow. This Lælia thrives very satisfactorily in the airiest end of an intermediate house. It should be grown in a basket, with rough peat fibre, charcoal, and abundant drainage for the roots. It should be kept well up to the light, and should have shade only during the brightest days of spring, summer and autumn. Care must also be taken to restrict the supply of water after the growth has been completed.

Phalænopsis Schilleriana.—Comparatively few Orchids can be called attractive at all seasons of the year; but this is one of the best, and when in bloom during the winter and early spring it can hardly be excelled. This plant was introduced from the Philippine Islands in 1860. The oblong leaves attain a length of eighteen inches in well-grown specimens; they are dark green, with irregular bars of gray on the upper side, and a pale purplish color underneath. The peduncle is more or less branched, and, according to the age and vigor of the plant, from one to three feet in length. The flowers are about three inches across, sepals oblong, petals very bluntly ovate, lip trilobed, the lateral lobes oblong and turned backward, with a yellow callosity at the base, and the front lobe lyre-shaped. Pale lilac, faintly suffused with rose, is the prevailing color, and the lower sepals and lateral lobes of the lip are distinctly spotted with red. All the flowers expand about the same time, and they last in good condition from six to eight weeks. Under careful cultivation this plant is remarkably floriferous. A specimen grown in England bore at one time no fewer than 378 flowers. There are numerous varieties of *P. Schilleriana*, all worthy of cultivation, and in some of them the flowers are fragrant. The odor is agreeable, and it is most sensible during bright weather. *P. Schilleriana* should be planted at an elevation of three or four inches above the top of a well-drained pot or basket, with clean crocks for the drainage, and lumpy charcoal and fresh, clean sphagnum about the roots. It requires a stove temperature, with protection from sunshine, and sufficient water should be given to preserve at all times the luxuriance of the Sphagnum in which the plant is growing. Water should not remain about the leaves for any considerable time.

Cambridge, Mass. *M. Barker.*

Cattleya speciosissima.—This has become one of the most conspicuous of winter-blooming Orchids, and, although a rather shy bloomer, judicious treatment will overcome this objection. For the two winters before the last we had little success in flowering these plants, but this season several of them have behaved to our perfect satisfaction. The size of the flowers varies from six to eight inches in diameter, with a lip from one and a half to two and a half inches across. Their color is hard to describe, as each plant has its special shade, ranging from a light, delicate, flesh-color to a decidedly rich purple, with a dark mauve-purple lip. Again we have some varieties with sepals and petals blotched and veined in the manner of *C. Mossiæ*, var. *Hardyana*. We grow the plants in a house with *C. Trianæ*, so as to have them in winter-flowering quarters. They are in shallow pans and baskets suspended from the roof, although many specimens of the variety Lowii, which bloom as freely as *C. Trianæ*, are left in pots. My practice is to give them all the sunlight possible from the beginning of October until the end of February, during which time they will grow and flower freely. They must be sparingly watered at all times, or they will suffer from "the spot." They never should be watered until they become rather dry. Nor do I give them any "rest" if at all inclined to grow. Some plants that bloomed here last July and August are in bloom to-day again, and probably by next July or August they will flower again. The stems appear to be quite as large as those made during the summer, and in my opinion it does them no harm whatever to flower, if the flowers are not allowed to remain on them too long. A comparatively small amount of fibre and moss, with a little charcoal, will suffice as a compost, as they do not like much around their roots, and, of course, they must be kept far from snails and white scab.

Staatsburgh-on-Hudson. *F. Atkins.*

Greenhouse Rhododendrons are proving much more valuable every year, and Messrs. Veitch are adding new varieties almost every month, many of them superior to the older kinds. A collection of flowers of some of the best varieties was shown at a late meeting of the Royal Horticultural Society, and were generally admired. They comprised Vesta, a large-trussed, large-flowered cream-yellow variety; Nestor, rich yellow; Scarlet Crown, a brilliant red, with large flowers; Balsamæflorum aureum, and about a dozen others. These plants are scarcely ever flowerless. They are always in growth, and as fast as a shoot casts its flowers it pushes into new growth, matures a bud, and blooms again. Consequently upon the same plant occur, simultaneously, young growths, flower-buds and expanded flowers. A dozen plants will yield flowers from January to December.

Kew. *W.*

Clerodendron Thompsonæ.—This fine old plant should not be neglected or displaced by newer favorites. It is suitable for pot culture for conservatory decoration, or it can be grown as a climber, and the flowers are useful for cutting. It is of scandent habit, with large, smooth, dark green leaves, and its large panicles of bright crimson flowers, with pure white calyces, invariably arrest attention. It is easily propagated by cuttings taken in summer. In fall the small plants may be placed under the bench in a warm greenhouse and kept dry. In February or March they should be potted in light rich soil, with plenty of pot-room, as they make roots freely. If shifted whenever pot-bound, they will bloom almost all summer. Old plants require the same treatment. They must be shaded from the sun when growing, as the foliage is very tender. When the blooming season is over they should be freely watered and kept growing until it is time to ripen the wood, when they may have more sun and less water. If wanted for winter-flowering they require a short rest, after which they may be shaken out, repotted and started again. Specimens too large for this treatment will flower better if considerable of the old soil is removed and replaced by fresh compost. If not wanted till spring they can remain in a cool light place, with just enough water to keep them alive through the winter.

Maywood, N. J. *J. S. T.*

Correspondence.

Wild Flowers in California.

To the Editor of Garden and Forest:

Sir.—It has been an open winter in California, with nearly two months of sunshine, but the wild flowers do not seem more forward than usual. To-day (March 2d) I found, along a warm hill-side, where the flowers bloom earliest, the Manzanita (*Arctostaphylos Menziesii*), which is a low shrubby tree here, loaded with its Heath-like blossoms. Stray specimens bloom earlier, but the mass of the bushes are now blooming. My little favorite, *Dodecatheon Meadia*, was in great abundance on some warm slopes. With its dainty Cyclamen-like flowers it is one of our prettiest wild plants. On a shaded hill-side there were several Cardamines blooming. This is *C. pauci-secta*; our best, *C. angulata*, is also in flower in the cultivated fields. The yellow Buttercup (*Ranunculus macranthus*) and *Fritillaria lanceolata* I found well-budded. They are late this season. Certain warm slopes were yellow with the blossoms of a low-growing composite plant, and *Castilleia parviflora*, one of the Painted Cups, is also in bloom. The introduced plant, *Erodium cicutarum*, which we Californians call Alfilleria, is, as usual, among the earliest to blossom. In gardens the Chinese Narcissus is well over its flowering. The scarlet Japan Quince is now in bloom, as are most Narcissi.

Some of my fall seedling Pansies are in blossom. Laurestinus, Polyanthus, Oxalis and Verbenas are becoming quite plentiful. The large Dog-tooth Violets (*Erythronium grandiflorum*) in my bulb-beds are well in bud.

Ukiah, Cal. *Carl Purdy.*

Peaches and Yellows.

To the Editor of Garden and Forest:

Sir.—In a recent number of Garden and Forest, the fact was referred to that Peach-growers in New Jersey and elsewhere claim that they can cure the yellows, and it was stated that this claim has been disproved by experiment. Yet, though the experimental proof is undoubtedly accurate, so also are the statements of the New Jersey growers. The truth is, that much, if not the larger proportion, of so-called yellows in New Jersey is not due to the specific disease, but to the attacks of the root-louse, which, by sapping the roots, gives the yellow appearance. This can be cured by the application of kainit or of tobacco, and it is altogether too sweeping a statement as to the prevalence of this disease in southern New Jersey that is frequently made. Killing the lice cures the yellows, and this is the basis for the claims made by the New Jersey growers.

Rutgers College. *John B. Smith.*

The Nettle-tree in New Jersey.

To the Editor of Garden and Forest:

Sir.—In Dr. Britton's "Catalogue of Plants found in New Jersey" *Celtis occidentalis* is set down as "not very abundant in the Pine Barrens." I have never found this tree in the Pine Barrens, strictly speaking, of Atlantic County. It is to be found, however, in various localities, particularly along or near streams which flow into salt-water. It is especially abundant near Pleasantville, where it grows best on lands which border on and slope toward the salt marsh. The largest tree I have seen here measures very nearly two feet in diameter, and its branches have a spread of forty feet in diameter. I estimate its height at about thirty-five feet. This tree, which is an unusually large one for this region, is a solitary one, and being finely formed, its "peculiar beauty" (as noted in Garden and Forest, vol. iii., p. 42) is especially seen at this time of the year.

I may add that this tree stands near the site of an Indian village and burial-place, and has long been a landmark in the neighborhood.

Pleasantville, N. J. *John E. Peters.*

Viola hastata.

To the Editor of Garden and Forest:

Sir.—The illustration of this Violet in your issue of February 18th, and the note concerning it, reminded me that one peculiarity of this plant is not mentioned in any description of it which I have seen—I mean its glossy, brown-veined foliage. The upper side of the leaves is green, netted with brown veins; the under side is often entirely bronze. If this characteristic color could be retained in cultivation (which I have not yet tried) the plant would be of especial value. The Halber-leaved Violet likes light soil along the sunny borders of woodlands.

Two other Violets of ascertained merit for garden use are worth mention here. *Viola striata* has large velvet petals, cream-white, veined with purple; it is fully as handsome as *V. Canadensis*, and thrives in more open exposures than the latter, but wholly lacks its delicate fragrance. *V. rostrata*, with pale lavender colored flowers bearing curious long spurs, is a somewhat rare species that is charming in the Fern garden.

Geneva, O. *S. F. G.*

Lilium Hansoni.

To the Editor of Garden and Forest:

Sir.—For the sake of accuracy I beg to state that this Lily first flowered at Leiden with a Dutch amateur; I obtained by the agency of Mr. Mater, then manager at Siebold's, a bulb for $20. This was in 1862. The following year I had a few more bulbs at $25 and $32, which I then carefully cut to pieces, leaving at each scale a bit of the trunk or body of the bulb, and I thus obtained by sowing these scales about 150 bulbs within two years. They ranged in size from that of a pea to that of a walnut. As soon as my first bulb divided I sent a bulb to Mr. Hanson, who then flowered it first in America.

Baden Baden. *Max Leichtlin.*

Periodical Literature.

In *Scribner's Magazine* for March, Mr. Samuel Parsons, Jr., has an interesting article entitled "The Ornamentation of Ponds and Lakes," which ought to encourage all who own a stretch of river-front or even the tiniest pond or brook to experiment for themselves in this direction. At least half the knowledge required for such experiments is the knowledge of what not to do, and something of this Mr. Parsons conveys by his account of how he himself failed in his first attempts with aquatic and moisture-loving plants. His account of the way in which he subsequently worked to better advantage on a country-place which, although it was but ten acres in extent, fronted on a broad, placid stream and extended over a narrow strip of land on the opposite side of the water, should, however, renew ambition in the reader's mind. His advice with regard to the advantage of emphasizing Nature's own arrangements of shore line and vegetation is as clear as it is judicious, and the beautiful picture of the stream of which he speaks, with the two tall Poplars accenting a little promontory and the path kept far enough away from the shore not to interfere with the fringing vegetation, greatly helps the impressiveness of his words. We should have been glad, by the way, had he dwelt upon this question of paths, for no fault is more common in the arrangement of ornamental sheets of water than the establishment of paths close to the brink. A formal, artificial look is thus given to the scene and no good purpose is served; for, of course, it is never necessary to come quite close to the water except when a boat is to be taken, and for this special and proper provision can be made at some single spot. When one wishes merely to look upon the water, it is far more delightful to see it over at least a narrow strip of turf spreading out into aquatic or semi-aquatic plants than against a hard line of gravel or stone. We should think the fact self-evident were not instances of what seems to have been a contrary belief so sadly frequent both in public parks and in private grounds. We have too often praised the beautiful aquatic plantations which Mr. Parsons has introduced into the basins of our New York parks to feel any necessity for quoting his own words about them. The pictures which are given of these basins will interest readers who live at a distance from New York; they are extremely pretty and reasonably faithful, although the extent of the basins seems exaggerated, especially where the Bethesda Fountain in the Central Park is shown.

In an article called "Australian Cities," by Mr. George R. Parkin, published in the March number of *The Century Magazine*, he describes the magnificent harbor of Sydney, and then adds: "I doubt if any public pleasure-grounds in the world contain so many attractions as do the park and botanic gardens bordering on the bay. Inclosing one large arm of the harbor, facing another, and looking out upon the waters where navies can float at ease, their position is unrivaled. The climate favors the growth of sub-tropical vegetation as well as that of the temperate zones, and great skill has been shown in making the most of such an opportunity for effective landscape-gardening and interesting botanical experiments. The grounds are large enough to furnish ample room for the thousands who flock to them on Sundays and holidays. Beautiful public gardens are not confined to Sydney, but form a striking feature of Melborne, Adelaide, Brisbane, Ballarat and every considerable Australian town. They enter into the life of the people both for pleasure and for instruction. The services of highly skilled botanists are secured to give them scientific interest. Experiments in acclimatization are constantly carried on, and have a wide range from the advantages of climate. Several have attached to them zoölogical collections of considerable interest. At Ballarat private generosity has added a beautiful collection of Italian marbles. The brilliancy and profusion of the semi-tropical flowers, and the ease with which large numbers of Tree-ferns are reared in light structures of lattice-work, make possible effects in gardening which are very striking to northern eyes."

Interesting descriptions of tracts of country little known or wholly unfamiliar to Europeans are contained in Mr. W. W. Rockhill's article called "Through Eastern Thibet and Central China," published in the same number of this magazine.

The sudden and startling contrasts which are presented in many parts of these regions, and which were noted when we reviewed not long ago Mr. Hosie's account of his travels in central China, are well shown by the passage where Mr. Rockhill says: "As far as Jyékundo I had found the country desolate and stony, with only here and there a little brush growing

in the more sheltered nooks among the hills; but on the morning of the second day after leaving the town we entered a small cañon which opened on the Dré ch'u, and the scene changed as if by magic. Cypress and Juniper, Pine and Birch covered the mountain-sides, and along the brook, flowing between banks of velvety grass, powdered with little pink and white flowers, grew Plum-trees and wild Gooseberry-bushes. Honeysuckle and other shrubs, all in full bloom, filled the air with the fragrance of their blossoms. From the cavities in the tufa rocks hung Fern and creepers, from which the water dripped in glistening drops. For miles the country remained the same, becoming even grander along the Dré ch'u. There the road was high up on the steep mountain, 600 or 700 feet above the broad blue river, and on each side in the background were dazzling peaks of snow." Before reaching Tachien-lu Mr. Rockhill had traveled over seven hundred miles "in a country where no European had ever put his foot," and where only of recent years the Chinese have been able to implant themselves among the hostile natives. After leaving this town the road ran "down a rocky gorge on each side of which the mountains rise almost perpendicularly to a height of over two thousand feet. Wherever possible the soil was cultivated, Maize and Potatoes being the principal crops. Willows, Poplars and wide-spreading Walnut-trees were growing around the little villages and tea-houses with which the narrow rocky path was lined." It seems strange to learn that in this remote region Irish Potatoes are one of the principal articles of diet.

Exhibitions.

Orchids in New York.

THE fifth annual Orchid show of Messrs. Siebrecht & Wadley, which has been open for a week past in Madison Square Garden, has proved interesting on account of the variety of the plants exhibited, and highly suggestive as to the possibilities of effective floral arrangement which are offered by the immense area of the amphitheater. The ground-plan, which was designed by Mr. N. F. Barrett, consisted in the main of geometrical beds, which produced pleasing effects of form and color to one looking down upon them from the galleries, while tall, close hedges which separated the different sections were set so as to open vistas through which visitors who passed from one garden to another near the entrance caught glimpses of masses of flowers and foliage in the distance. The view through the centre was between a double row of Bay trees and terminated in a so-called Italian garden constructed on an incline, from the summit of which a sheet of water fell into a basin of aquatic plants. On one side of this avenue was a garden with formal, Box-bordered beds and masses of Daffodils, Crocuses, Lilies of the Valley, Tulips, Hyacinths and other spring-flowering bulbs. On the other was a garden where Spiræas, Lilacs, Andromedas, Forsythias and other shrubs in bloom were shut in by masses of Long-leaf Pine, Spruce and Red Cedar.

As this was an Orchid show distinctively, the principal display of these plants was massed on four large stands in the centre, while about them were formal beds of Paris Daisies, Cinerarias and Azaleas, with an outer border of Lilies, Roses, Heaths and Cytisus, which, in turn, were backed by specimen Palms and Tree Ferns. Altogether, it was a praiseworthy effort at a design for general effect, and, with the material at command, it was successfully carried out. Perhaps the time will come when a New York Horticultural Society can command all the treasures of the private and commercial collections near the city, and with such resources to draw upon this amphitheater would offer a field for infinite variety of arrangement. Well-grown individual plants would here be most useful. One of the chief attractions at an elaborate exhibition in Philadelphia a few years ago was a Fuchsia; but it was a Fuchsia of such size and vigor and wealth of bloom as one hardly sees in a lifetime. Half-a-dozen Azaleas, developed by years of careful attention into first-class specimens, would have fairly illuminated even so large a space as Madison Square Garden, and many other equally effective flowering plants could be named. At this exhibition the most attractive plants were the Orchids, and Orchids are not effective for massing. They do not show at a distance for what they are worth, and their place in the general scheme might have been better filled by plants of less individual excellence. Perhaps, too, they would have appeared to better advantage themselves if separated and partially screened from the rest of the exhibition and spread out over a more extended space, so that each one would have had opportunity to display its special grace and beauty—an opportunity which was partially lost when they were crowded so closely together. The well-grown Phalænopses shown by Messrs. Siebrecht & Wadley were certainly more effective scattered along the green bank at the east end of the garden than if they had been grouped together on a stage in the centre of the area.

The collection of Orchids shown by Messrs. Siebrecht & Wadley excelled all others in point of numbers, although the remarkable group from the garden of Mr. W. S. Kimball, of Rochester, contained quite as many species and varieties. Smaller than either of these collections, but of choice quality, was that of Mr. Hicks Arnold, of this city, containing such varieties of *Cattleya Trianæ* as Aspasia, Pandora, Splendidissima and others, with *Phajus tuberculosus*, *Cypripedium Leeanum*, *C. Schlimii* and many more of the best of this genus. Mr. Eyermann's collection did not reach the garden in time for the early days of the exhibition, but there was a large and well-selected consignment from Mr. William Matthews, of Utica, New York. The Rose Hill collection was very strong in its abundance of good varieties of *Cattleya Trianæ*, and there were many well-grown plants of *C. Percivalliana* and *C. Lawrenciana*. Besides the Phalænopses, which deserve special mention on account of the vigorous growth of such choice sorts as *P. Stuartiana*, *P. Schilleriana* and the like, the Cypripediums were a great attraction, including specimens of *C. Argus*, *C. Spicerianum*, *C. insigne Chantini*, *C. Harrisianum* and scores more, of the pick of this popular genus.

To name the noteworthy plants in Mr. Kimball's collection would be to make a catalogue of the entire list. There were some sixty varieties of the very best Cypripediums nestling among low Ferns, and over them arched the most delicately beautiful of Odontoglossums and Miltonias. Among his Dendrobiums were *D. Cambridgeanum*, *D. Freemanii*, *D. Findleyanum* and *D. Jamesianum*, and the gem of his Cattleyas was a striking variety of *C. Lindleyana*.

Besides the Orchids, the more striking features of the show were the many tall Cocoanut Palms, some beautiful Pritchardias, and numbers of specimen Ferns and Pitcher plants. The exhibition was well attended throughout.

Notes.

Seventy-eight thousand four hundred and fifty-two potted plants were used last year in decorating the parks and gardens of the city of Berlin.

The *Florida Agriculturist* says that many growers in Florida, having become tired of the shy-bearing Navel Orange-trees, have resorted to girdling them with considerable success.

The longest avenue of trees in the United Kingdom is said by the *Northern Gardener* to be one of Beeches, in Savernako Forest in Wiltshire, which is five miles in length. The longest avenue in the whole civilized world is said to be at Mildura, in Victoria, where the Government of that State have made a wide arborescent walk fifteen miles long, leading almost straight to the extensive irrigation region of the colony.

In a large Pineapple plantation on the Indian River the fertilizer which seems to give the best success contains a large amount of kainit. Captain Thomas E. Richards, the proprietor, does not use much nitrogenous manure because the plants thus fed shoot up breast-high, and then the apple falls over, becomes burned in the sun and is coarse and spiritless. It is found that the fruits do better when they grow on short, stocky stems hardly more than knee-high.

Among the novelties that are occasionally seen in the florists' windows this season are forced plants of the Pale Laurel, *Kalmia glauca*, the small terminal corymbs of lilac-colored flowers being quite attractive. The plant, however, has a rather bare appearance, because the foliage, which is not naturally very abundant, is still more sparse in the forced specimens. The Kalmias are among our most beautiful shrubs, but it is questionable whether this one at least can ever be forced with advantage.

The Japanese *Akebia quinata* has been planted for a great many years in this country, and it has proved one of the best of vines to cover screens and arbors. Professor Georgeson, in the *American Garden*, says that it is largely used in Japan for wicker-work, and that nothing can surpass for this purpose the strong, slender and pliable shoots, which are of almost uniform thickness throughout. As these shoots are long and thin, they do not need to be split before they are used, and articles made from them are stronger and more durable than willow-ware. The Akebia is used in the manufacture of baskets, trays and even of sun-hats.

In the third annual report of the Cornell Agricultural Experiment Station we find noted among the investigations under way: An experiment with the cultivation of Huckleberries, both at the station and upon a piece of land in the eastern part of the state; tests of edible plants of foreign countries to determine which ones give promise in this state; tests in the automatic ventilation of greenhouses, and several other features of greenhouse construction; a large experiment to determine the influence of food, chiefly concentrated fertilizers, upon the variation of plants; a large experiment with hardy foreign and domestic Roses; a systematic study of Horse-radish, with particular reference to propagation and improvement; and at all times the study of the species and the variations of plants under culture. Photography is used freely in all the station work as a means of preserving accurate records.

A timely appeal to the Legislature of Pennsylvania for an Alleghany Mountain park is made in *Forest Leaves*. In behalf of this project a quotation is made from Governor Beaver's last message, wherein it is truthfully said that while it is difficult, now when the state has practically parted with all its lands, to re-acquire them, yet without such actual ownership of the waste land of the central mountain belt of the state it is hard to devise any efficient plan for reforesting it. Tens of thousands of acres, not worth for any commercial purpose the taxes annually levied upon them, and which under the present system of tax rates are used to defraud the unwary, might be made productive to the commonwealth if held and controlled by it. An Alleghany park, including a large portion of the mountain region of the state, might easily be made so as to protect the head-waters of all the rivers which there take rise.

The largest apple-tree in New England, according to the *Boston Journal*, is in the north-western part of Cheshire, Connecticut, and it stands in the dooryard of Mr. Delos Hotchkiss. Its age can be traced by a family tradition to 140 years at least, and it may be twenty or twenty-five years older. It is now of symmetrical shape; the trunk is nearly round, without a scar or blemish; there are eight large branches; five of them have been in the habit of bearing one year, and the remaining three the next. Mr. Hotchkiss has gathered in one year from the five branches 85 bushels of fruit, and his predecessor has harvested 110 bushels from the same five branches. By careful measurement, the circumference of the trunk one foot above the ground, above all enlargements of the roots, is thirteen feet eight inches. The girth of the largest single limb is six feet eight inches. The height of the tree is sixty feet, and the spread of the branches as the apples fall is 100 feet. The fruit is rather small, sweet, and of moderate excellence.

A writer in the New York *Evening Post*, when describing the beautiful effects upon the scenery of the Central Park of the snow-storm which occurred during the last week in February, said: "One effect on some of the Pine-trees was very curious: the long, bristle-like, diverging leaves that surround the terminal buds were matted continuously together by the clinging snow into cups of trumpet-mouth shape, the larger of which might contain a closed fist, and the sight of a good-sized tree with these turned all one way was very striking. Detached beauties and curiosities abounded. A great Beech standing apart near the Ninety-sixth Street gate was a type of all the solitary deciduous trees, the outline of its branch-tips all in soft white losing its firmness and appearing to dissolve into the storm. A tall, full Weeping Beech was like an arrested waterfall of spray. The Dogwoods held up stretched sheets descended out of heaven. The white Birches seemed like mists. The evergreens, struck all through with white, became soft gray. But the strange beauty of the whole view was the great wonder. That moved even the park-keepers to admiring speech, and prompted one of them to ask, 'Where's all the people in New York that pretends to like fine scene-ry?'"

The Fruit-Growers' Association has taken firm hold in England, although its inauguration dates only two years back. Formed for the purpose of diffusing a knowledge of such fruit as may be cultivated out-of-doors in that country, it has already done much toward the extension and improvement of fruit-cultivation. Lectures are given in various parts of the country by qualified members of the Association; exhibitions are held and tempting prizes given, and even professional advice has been gratuitously afforded to those seeking it. The report of the Association has just been published, from which it appears that two delegates, Mr. G. Gordon and Mr. Lewis Castle, were sent to Ireland to inquire into the condition and prospect of fruit-culture in that country. Thirty-six papers have been prepared and read by twenty-two of the leading growers and authorities during the two years of the Association's existence; some of these papers have been printed and circulated freely. As an example of how much good may come from work of this kind, it is stated that over two thousand inquiries by letter were answered by the Association last year; also that the increase in the acreage under fruit-cultivation in England during the last two years is shown by the agricultural returns to be 12,637 acres.

In an address recently delivered in Vienna upon "Persian Fruit-trees," Dr. Stapf, as reported in *Gartenflora*, said that Apples, Pears and Cherries flourish in that country only at elevations of from 6,000 to 7,000 feet above the sea. Persian cherries are small, with reddish or yellowish watery flesh, and an insipid, almost bitter taste. The plums, too, are not very good, but, on the other hand, the apricots are far superior to those grown in Europe. The trees often grow to "gigantic dimensions," especially near Shiraz, at an elevation of from 5,500 to 7,500 feet; and the fruit is very large and of an "exquisite sweetness." Two kinds of peaches are grown, one of the ordinary downy sort and the other a small smooth-coated, delicious variety. Pomegranates are universally seen, being of shrubby habit when wild, but of tree-like size in gardens. One species is devoid of seeds. Walnuts are very widely grown, and near Shiraz an enormous specimen may be seen at an elevation of 8,000 feet, while further north, in the Kohrud Mountains, there are fine large plantations at an equal elevation. Even Fig-trees flourish up to an elevation of 5,650 feet, or higher still in the province of Farsistan, and the White Mulberry follows to almost the same height, while the Black Mulberry, of which several kinds are grown, lags 1,500 feet below it. A singular fruit is supplied by the so-called Oil-Willow (*Elæagnus angustifolia*) which, when cultivated, yields a berry resembling an olive in size and shape, but of a "honey-sweet taste." When gardens are not encircled by walls Poplars and Willows are planted as wind-breaks—*Populus alba* and *P. pyramidalis*, *Salix Persica* and *S. æmophylla* being chosen. Here and there in gardens immense Maples may be seen, and more seldom Elms, among the latter being a remarkable variety (*Ulmus campestris*, var. *umbraculifera*), with a thick spherical head. Elms and Celtis-trees and Ashes are planted in front of the mosques, but Planes and Cypresses are the trees best beloved by the people. The former are especially chosen for avenues, where they are often trimmed so that they grow to an immense height, but develop a head of comparatively small size. The Cypresses are either columnar or spherical in shape, the form with horizontal branchlets never being grown.

The death is announced of Mr. John Dominy, in his seventy-fifth year. Of the English gardeners who have lived in the present century none has distinguished himself more than this quiet, genial and pleasant man, who by his skill as a hybridizer has created many plants of rare beauty. It is to him that is due the credit of first successfully hybridizing Orchids and Nepenthes, and it is to his skill and patience that the world owes such beautiful garden plants as *Cattleya Exoniensis*, *Calanthe Veitchi* and *Lælia Domini*. Dominy passed nearly all his active life in the employ of the Veitches, first at Exeter and then at Chelsea; he was much respected by the horticultural profession, and received in 1880 the large gold floral medal of the Royal Horticultural Society, and when he retired ten years ago from service a substantial testimonial was raised by popular subscription among his friends. He was a man whose works are likely to live long after him and to be admired by generations to whom the name of John Dominy may perhaps be unknown.

Catalogues Received.

C. E. Allen, Brattleboro, Vt.; Flower and Vegetable Seeds and Plants, Small Fruits and Fruit-trees.—David Hill, Dundee Nursery, Dundee, Ill.; Evergreen Trees.—Wm. Elliott & Sons, 56 Dey Street, New York; Flower and Vegetable Seeds.—Ellwanger & Barry, Rochester, N. Y.; Roses.—J. W. Manning, Reading, Mass.; Hardy Border Plants and Hardy Trees.—Samuel C. Moon, Morrisville, Bucks Co., Pa.; Bulbs, Small Fruits and Fruit-trees, Deciduous, Ornamental and Evergreen Shrubs and Trees.—Parsons & Sons Co., Limited, Flushing, N. Y.; Hardy Ornamental Trees, Flowering Shrubs and Vines, Rare and Choice Plants.—Josephus Plenty, 144 Pearl Street, New York; Conservatories, Greenhouses, Vineries, Skylights, etc.—Carl Purdy, Ukiah, Mendocino Co., Cal.; California Bulbs.—John Thorpe, Pearl River, N. Y.; Chrysanthemums.—Siebrecht & Wadley, Rose Hill Nurseries, New Rochelle, N. Y.; Orchids, Palms, Ferns, Roses.—Schlegel & Fottler, 26 South Market Street, Boston, Mass.; Flower and Vegetable Seeds, Bulbs and Plants.—P. E. Transon Bros., Orleans, France; Small Fruits, Fruit and Shade-trees, Roses, etc.

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Forests and Floods.

In the River and Harbor Act, approved last year, there was a clause ordering an examination of the West Branch of the Susquehanna River, in the state of Pennsylvania, with a view to ascertain (1) whether the navigation of this stream could be permanently improved by the construction of embankments or otherwise, and to ascertain (2) the best practical method of confining the waters of the river during the times of flood to the general course of its channel. Inasmuch as the difference of elevation between the mouth and the head of the West Branch, covering a distance of 125 miles, is more than 400 feet, and since, from physical conditions, the improvement of the channel for purposes of navigation could only be accomplished by means of locks and dams, it is evident that no material and permanent improvement in this direction could be hoped for without an enormous expense, and the engineer who has been making the examination so reported.

We desire, however, to call attention to the portion of the report which relates to the floods of the river. We do this, not because any new facts or arguments are adduced, but because this is an official paper prepared by Major Charles W. Raymond, who is known as an engineer of great knowledge and experience, and who is altogether above being biased by any sentimental considerations. The basin of the West Branch of the Susquehanna occupies a high table-land, and has an area of nearly 7,000 square miles, which is about one-fourth of the drainage of the Susquehanna River and its tributaries, or about one-seventh of the area of the state. Major Raymond gives some account of the floods of 1865 and 1889, the latter of which will be remembered as signally disastrous to life and property; seventy-eight persons lost their lives, and houses, mills, lumber and live stock were swept away, and farms and fertile bottom-lands were covered with sand and gravel. As first among the causes which increase the violence of such floods, Major Raymond names the destruction of forests. In this particular region the lumbering operations have been very extensive. In addition to the ravages made by fire, it is stated that the total amount of lumber, board measure, which has been cut here since 1862 is 5,250,000,000 feet, representing 30,100,000 logs. As for the effect of lumbering operations on this large scale, Major Raymond says:

The destruction of forests from the mountain crests and slopes of a water-shed is undoubtedly the principal cause of the increase of the average magnitude of floods. The evidence collected during the last twenty-five years, establishing this conclusion, is well-nigh overwhelming, and it is verified by repeated observations, not only in the mountainous countries of Europe, but also in our own land. By the removal of the forests from the mountain slopes the ground is robbed of its protecting covering of roots, moss, leaves and porous soil, which forms the forest-floor and serves as a natural storage reservoir, holding back the water of rainfall and melting snow, and compelling it to descend slowly to the channels. By the subsequent cultivation of the lands, ditches and drains are made to facilitate the more rapid discharge from the cultivated surfaces, until the rain rushes down the hill-sides in destructive torrents, gullying the ground and choking the minor lines of drainage with rocks, sand and gravel, and hurrying into the recipient of the water-shed volumes of water which before reached it in a comparatively quiet flow.

Colonel Torrelli affirms as the result of careful observation that four-fifths of the precipitation in forests is absorbed by the soil or detained by the surface of the ground, to be gradually given up in springs and gentle rills, and only one-fifth of the precipitation is delivered to the rivers rapidly enough to create floods. Upon the same slopes and surfaces denuded of their forests the proportions are reversed. That the destruction of the forests in mountainous water-sheds is followed by disastrous floods, where previously such floods were unknown, is not a matter of theory, opinion or probability, but is a well-established physical fact.

Other causes which increase the effect of floods are enumerated; among them artificial constructions, such as bridges and dams, besides the collection of logs, lumber and ice in the stream and upon its banks. But these are of secondary importance. As to methods of prevention, the devices of storage reservoirs and transverse barriers carried across the lines of drainage seem to be inapplicable to this region, for reasons not necessary here to consider, and the principal reliance must be in forests. On this last point the report continues:

The method of prevention by the maintenance and planting of forests upon the head-waters and upper slopes of the affluents of the basin depends for its efficiency upon the ability of forest-covered slopes to retain for a considerable time a large percentage of heavy rainfall, thereby preventing the surcharge of the lines of drainage. In France, Italy, Germany and Austria the systematic planting of mountain slopes, as a means of restoring lost fertility and preventing the inundations following the destruction of forests, is an established fact, followed by results more satisfactory than the most sanguine anticipations. . . . As population becomes more dense and the injuries from these uncontrolled floods increase, the time must come when the execution of a thorough scheme of control will be demanded. This will require the construction of numerous low dams and other inexpensive works to restrain the flow of the more remote tributaries and give the lower valley time to discharge the flood volume; and, besides this, new forests must be planted and maintained.

It is no part of our present purpose to speak of the close and costly survey of this region which would be necessary before any intelligent work on the details of a project of this magnitude could be begun. Nor is this the place to consider whether the general Government should undertake any work so local in its character. But the same forces which have destroyed the forests which sheltered the head-waters of this branch of the Susquehanna have been at work with more or less energy about the sources of every stream whose waters find their way from the Appalachian Mountain system to the Atlantic Ocean or the Gulf of Mexico. Between the Adirondacks and Alabama is a continuous line of such basins as that surveyed in Pennsylvania by Major Raymond, and more serious still is the threat of devastation from the mountain systems of the west, with their greater altitude and steeper slopes.

It is almost disheartening to feel the necessity of reiterating these statements which have never been controverted and rarely questioned, because all that is said and written seems to exert no actual restraint upon the axes and fires which keep steadily at the work of making bare the slopes and crests of our mountains. But reasonable appeals to reasonable men are never wholly lost. If the state of Pennsylvania had a Forest Commissioner who would do for every drainage basin in the state what Major Raymond has done for a single one, such reports presented year after year to the Legislature could not fail in the end to awaken attention. Every state in the Union has immediate use for some intelligent officer to study its forest-interests and bring the various phases of the forest-problem before the people and their law-makers. This step has already been taken in some states, and the proposition is strongly urged in others. In our view, it is a measure which should be at once adopted by all.

It is a matter of regret that Congress has once more adjourned without passing the bill for the enlargement and protection of the Yellowstone Park. Up to the very latest moment the friends of the measure, who have been laboring for it for eight years, had hopes of its passage. They were anxious to have the bill called up, feeling sure that in the committee of conference the amendment added by the railway lobby would be stricken out; but in the rush of business at the closing hours they could not command a hearing. The whole matter must now rest till Congress meets again, and meanwhile the great forest-tracts which it was proposed to add to the park will continue to be devastated by fires, and the noble game will be slaughtered for their hides by skin-hunters. The value of the park, as it is admitted by every one, would be greatly increased if the head-waters of the streams which pour into it could be protected, if the picturesque valleys and panoramic scenery in the proposed extension could be added to the wonders already within the park, and if the favorite breeding-places of the elk could be saved. But the opportunity to secure all these advantages has again been thrown away by the representatives of the people because the representatives of a corporation demanded some exclusive privileges.

The Rose-bush of Hildesheim.

The town of Hildesheim, which lies on the little river Innerste and now contains about 25,000 inhabitants, is one of the oldest in northern Germany. Episcopal rank was bestowed upon it in the year 835; and Bishop Bernward, who occupied his chair from 993 until 1022, was a famous architect and worker in many minor artistic crafts, and signs of his handiwork still remain to interest the traveler. During the thirteenth and fourteenth century the town was especially flourishing and important; it belonged to the Hanseatic League, and retained its title of "free city" until 1803. The Romanesque architecture of the district is very well represented in Hildesheim, and its domestic buildings of later mediæval and Renaissance times are especially famous, being many in number, rich in type, and little injured by restorations. But perhaps the most famous object in the city is the ancient Rose-tree of which we give a picture on p. 127. East of the cathedral lies a two-storied cloister of Romanesque construction; in the centre of this rises the Chapel of St. Anne; and against the wall of the apse of this chapel rises the Rose-bush. Local tradition ascribes its planting to Louis le Débonnaire, the son of Charlemagne, who was crowned in 816 and died in 840. History does not justify this belief, which would give the Rose-tree an age of over a thousand years; but it is confidently asserted, on historical grounds, to be 800 years old. But the stock we see to-day is not the one that flourished during so many earlier centuries. Late in the last century the Rose died down to the ground, and its present height, about thirty feet, represents the one hundred and ten years of growth from the ancient root. This in itself seems a respectable age for a Rose-bush; but if its entire life is included, the Hildesheim tree is certainly the oldest as well as the most famous in the western world. And if an antiquity as great is claimed for others in the Orient, the assumption rests, we must believe, on less well-ascertained facts than those which German historians can cite.

Chamisso.

Few poets are dearer to the popular heart in any land than is Adalbert von Chamisso in Germany; and while school-children there learn his ballads as they do those of Schiller and of Uhland, his fame has been carried into other lands by the prose story of Peter Schlemihl, "the man who lost his shadow." But how many people now remember that Chamisso was not only a poet, but a scientific man of wide accomplishment who added largely to the knowledge of his time, and was the friend and colleague of Humboldt, Johannes Müller and Ehrenberg?

It seems odd, with his patriotic ballads in mind, to learn that Chamisso was born in Champagne, in France. His father was of the noble lineage of Boncourt, and was one of the great throng of *émigrés* whom the Revolution drove to seek new homes in alien lands; and the boy Adalbert, born in 1781, and brought at a very early age to Berlin, there received his education and became a page in the royal household. Later he served in the Prussian army, was taken as a prisoner of war to France in 1806, and returned there afterward for brief periods, during one of which he was instructed in botany by the son of Madame de Stael. Even as a child he had shown a strong inclination for the study of nature, and when he again established himself in Berlin at the age of thirty, he entered the university as a student of medicine, worked in the zoological museum, investigated electricity and magnetism, as well as mineralogy and geology, and, in short, for three years pursued science with unusual breadth of range and intensity of application. In 1815, highly recommended by his teachers, he was appointed to accompany Von Kotzebue on the famous voyage of exploration in the ship Rurik, the ultimate aim of which was to discover a north-east passage from the Pacific to the Atlantic Ocean. This voyage lasted three years, and, though the arctic passage was never attempted, many and varied lands were visited which then were little known to science, including Teneriffe, Brazil, Chili, the Sandwich Islands and California, as well as numerous points in the far north. The name of Chamisso Islands within the arctic joins with several others to perpetuate the memory of the poet and his companions in this voyage. Under difficulties even greater than those which, fifteen years later, embarrassed Darwin during his voyage around the world, Chamisso, like Darwin, worked diligently in many branches of science while on the Rurik, brought home large and varied collections, and published an account of his experiences in a book, cast in somewhat popular form, called "Views and Observations during a Voyage of Discovery." In 1818 he was appointed assistant in the Botanical Institute at Berlin, and held the office until his death in 1838. In 1835 he became a member of the Academy of Sciences upon the nomination of Humboldt and Kunth. A botanical text-book for schools which he wrote had great success in its time, and a species of plants belonging to the unwilting Amaranths was, in his honor, named Chamissoa by Kunth.

Chamisso's favorite plants are said to have been those of the water, especially the *Potamogetæ;* but nothing that grew escaped his keen attention, and he distinguished himself during his very first days on the Rurik by discovering on the English coast near Plymouth a little plant, *Centaurea nigrescens*, which no local botanist had noticed. Heavy rains or burning heats prevented him from making the best of his time in certain countries which he visited and where the stay of the ship could not be long; but nearly the whole flora of the Radak chain was collected by him, and on the coast of California, then almost virgin soil to the botanist, he made many interesting discoveries, including a now familiar flower, which he named for the surgeon of the Rurik—*Eschscholtzia Californica*. Seeds of this he brought home, and to him must be traced its introduction into European gardens. So generously did he distribute his collections among his fellow-savants all over Europe that much of the service he rendered to botany has never been placed to his credit. But, as has been said, other branches of science—zoölogy, geology, anthropology, folk-lore, linguistics, and more besides—likewise engaged his attention; and he not only collected largely, but thought profoundly and suggested many new theories, in some of which he has been confirmed by the investigations of later days. For example, his theory of "propagation by alternating generations," based on a study of those very low forms of aquatic life called the Salpæ, went unheeded when he gave it to the world. But the labors of Steenstrup and Johannes Müller afterward confirmed it, in so far at least that Steenstrup declared that the honor of having led the way to an understanding of the different methods of generation characteristic of the lower organisms belongs "to the accurate and

ingenious investigator Chamisso." Indeed, one who follows Chamisso through all the fields of science in which he labored will often find him advancing ideas which later writers have either wholly or partially incorporated into theories that now command general acceptance, while the name of their first founder is forgotten by all except a few specialists. But my object has only been to show that the poet whom the world knows so well was "lined," as the French say, by a scientific man of much distinction; and perhaps those who think that an interesting association adds to the charm of even Nature's loveliest products will be glad to remember, whenever they look at the California Poppy, that it was discovered and named by the author of "Peter Schlemihl," and of the many charming ballads which mitigated the drought and dustiness of their first steps in the study of the German language.*

New York. *M. G. Van Rensselaer.*

Recent Botanical Discoveries in China and Eastern Burma.—IV.

Pedicularis.—Despite the wonderful variety displayed by this genus of plants, it has never yet received much attention from gardeners. The species may be difficult to cultivate, as they almost all grow in pastures in thick turf, and are, perhaps, in an early stage of development at least, root-parasites, like many of the allied genera. Looking through some of the illustrated periodicals, such as the *Botanical Magazine*, which has now appeared uninterruptedly for 113 years, we find that only three species have been figured, namely, *Pedicularis Canadensis* (t. 2506); *P. mollis* (t. 4599), an Indian species, and *P. megalantha* (t. 7132); also an Indian species, figured in the last completed volume. The last is really an ornamental plant, of which there are many in the genus, especially among the numerous Indian and Chinese species.

If gardeners have neglected this genus of herbaceous plants, botanists have not, as it has been monographed over and over again. The species are spread all around the northern hemisphere, from the arctic regions southward, in America, to the Andes, but not south of the equator. One of the species mentioned above, *P. Canadensis*, ranges from Canada to Florida and the mountains of central Mexico. In Europe the species are less numerous than in America, only two being found in Britain, and hitherto, I believe, no species has been found in Africa. In Asia they abound from the arctic regions southward to Ceylon and Burma; and they are especially numerous and ornamental in the mountains of India and China. So recently as 1888 Mr. C. J. Maximowicz† has monographed the whole genus, and since then Dr. D. Prain, Curator of the Calcutta Herbarium, has been engaged on a fully illustrated monograph of all the Indian species, only the letterpress of which has reached England at the time of writing this. Maximowicz enumerates 250 species, including a few imperfectly known ones; and Prain seventy Indian species, being nearly double the number described in Hooker's "Flora of British India" no longer ago than 1884. Finally, I have between ninety and a hundred in the "Index Floræ Sinensis," including several remarkable species previously undescribed. Mr. Maximowicz, in the monograph referred to above, gives a brief history of the literature of the genus, from which we learn how greatly the number of species has been augmented by comparatively or quite recent explorations. The Russian botanist, Steven, compiled the first monograph of the genus, which appeared in 1822, and contains descriptions of forty-nine species. Bunge followed in 1843 and 1846 with ninety-nine species, and Bentham in 1835 and 1846 with 109 species. The Russian explorers of central Asia and north-western China added a great many new species, bringing the total up to rather more than 150 in a synopsis by Maximowicz in 1877, with additions in 1881.

In 1886 the late Dr. Asa Gray described twenty-eight species in his "Synoptical Flora of North America." As already stated, Maximowicz's monograph raised the number to 250 species in 1888, and the great accession to the previously known species in this monograph was mainly due to the exertions of two French missionaries, Delavay and David, in western China. No fewer than forty-eight Chinese species were described for the first time; and the "Index Floræ Sinensis" adds descriptions of ten more.

All the species of Pedicularis are herbaceous plants, and apparently mostly perennials, though it is probable that some of them, perhaps a considerable number, flower only once. They vary in stature from two or three inches to four or five feet, and the leaves are alternate, opposite or verticillate, and present infinite variety in form and cutting, many of them being exceedingly elegant. The flowers, too, which are produced in clusters or spikes, or singly, are equally variable in size and color, and are very curiously formed, the tubular portion of the corolla being often very narrow and very long, and the upper lip often assuming the shape of a beak or proboscis, which is sometimes curved upward, sometimes downward, sometimes twisted, and sometimes very much elongated. In other species the upper lip is merely hood-shaped, or consisting of two lobes similar in size and shape to those of the lower lip, or in a few instances it is even shorter than the lower lip, or almost obsolete. The prevailing colors are shades of red and purple, but there are pure yellows and white, and commonly the flowers are spotted with another color.

Before passing to the Chinese species a few words respecting some of the more remarkable Indian species may not be out of place. Foremost comes *P. megalantha* (*Botanical Magazine*, t. 7132), because it is already in cultivation. It has rosy purple flowers two inches and a half long, with a very narrow tube, and a broadly lobed lower lip enclosing the incurved, beak-like upper lip. This has been successfully cultivated by Mr. George Wilson, the well-known English amateur horticulturist of Weybridge. I may mention that the plant figured in Regel's *Gartenflora* (1878, p. 195, t. 943) under the same name is apparently a different species, though closely allied, having clear yellow flowers, with a comparatively short tube. Noteworthy among other species of this section, which on the whole is the most ornamental section of the genus, are *P. bella*, *P. labellata*, *P. siphonantha*, *P. Perrottetii* and *P. bicornuta*. These must all be very beautiful plants. *P. bella* is a dwarf plant, from one and a half to three inches high, the large flowers springing from a tuft of leaves close to the ground, and constituting about two-thirds of the whole height. This little gem grows gregariously in Sikkim at altitudes of 15,000 to 16,000 feet, and although the color of the flowers is not given in the descriptions it is evidently a very ornamental species. Judging from dried specimens, it is an annual. *P. Perrottetii* is a native of the Nilgherry mountains, in southern India, and has the longest flowers of any known species; in fact, considerably longer than those of any other species. The whole plant is usually less than a foot high, and often not more than six inches, and in the finest specimens I have seen the white flowers are fully five inches long. *P. bicornuta* is an exceedingly handsome yellow-flowered species, a native of north-west India and Afghanistan, ascending to altitudes of 9,000 to 13,000 feet. The flowers have a comparatively short tube, but they are broad and showy; and the stems of this species are often a foot high, and studded with fully expanded flowers throughout their length. In this species the upper lip has the curious beak-like form inflexed, and twisted and bipid at the tip; hence the specific name. The Indian *P. tenuirostris* is also remarkable for the long proboscis-like upper lip.

Coming to the Chinese species, we find equal variety, though none perhaps with flowers quite so long as those of *P. Perrottetii*. On the other hand, there are some quite peculiar Chinese types. Especially remarkable among these is one to which I have given the name of *Pedicularis vagans*. It is a native of Mount Omei, in the province of Szechuen, at an altitude of 4,000 to 5,000 feet, and has long-stalked, radical leaves, about a foot long, and so like the fronds of a small Lastrea or Aspidium as to be easily mistaken for a fern, especially before the development of the flower-stems. The latter are long, slender and weak, and evidently clamber over other plants. In shape and cutting the leaves borne on the flower-stems are very similar to those of the white thorn, *Cratægus Oxyacantha*. The flowers are not large, and apparently inconspicuous, though their color is unknown. As an ornamental plant, however, *P. vagans* is far surpassed by many of the new Chinese species. Among them *P. superba* and *P. Rex;* the latter, having a large, hood-shaped upper lip, is also found in eastern India. Two other fine Indian species also occur in western China, named *P. labellata* and *P. Elwesii;* both dwarf plants with numerous stems, the latter having very large, dark purple flowers.

P. Przewalskii, in stature and size of flowers, resembles the Indian *P. bella*, described above; but the singularly beaked upper lip and broadly lobed lower lip of the corolla give the

* Most of the facts in this article have been drawn from an address delivered in 1888 at Berlin by Professor Dubois-Reymond, printed in the *Deutsche Rundschau*, and translated in the *Popular Science Monthly* for December, 1890. The portrait which accompanied the translation showed the youthful Chamisso—Chamisso the poet—with strong features, somewhat like those of Schiller, although less pronounced, a smoothly shaven face and long, thick, light hair falling in curls on the shoulders.

† While writing this I have received the news of the unexpected death of this distinguished botanist. It was known to us that he was in bad health, but we were quite unprepared for the sudden event, which has deprived Russia of her foremost botanist, and the botanical world of the highest authority on the flora of central and eastern Asia.

flower the appearance of a large-beaked bird with outstretched wings, only the beak is turned over the back. The flowers appear to be of a beautiful bright red. *P. Chinensis* has white or pale yellow flowers, with an exceedingly slender tube three inches in length. *P. muscicola*, as the name denotes, grows among moss. It is of very slender habit, with solitary axillary flowers, about two inches long, and of a deep purple red. *P. macrosiphon* is a closely allied species with even longer flowers. But almost all of the species are beautiful, and I must break off here.

Kew. *W. Botting Hemsley.*

New or Little Known Plants.

Bessera elegans.

SUMMER-BLOOMING bulbous plants succeed as a class in our climate, and deserve more general attention at the hands of cultivators than they receive. A few intelligent and enthusiastic amateurs grow them successfully, and obtain a great deal of pleasure and satisfaction from doing so; but, with the exception of some of the hybrid Gladioli, such plants are practically unknown in most of our gardens.

The pretty liliaceous *Bessera elegans*, which is represented in the illustration on page 125, is one of the best plants of this class. It is a native of the mountains of southern Mexico, and, if treated like a hybrid Gladiolus—that is, if the bulbs are lifted in the autumn and stored during winter in a dry place and replanted in the spring—it can be grown with perfect ease, and will repay the little care it requires with its bright flowers, which open in succession during fully two months of the late summer and early autumn. They are vermilion red, variously marked with white on the inner surface of the perianth-lobes and on the tube formed by the enlargement of the bases of the filaments which characterizes this genus. The beauty of the coloring of the flowers is intensified, too, by the bright purple of the anthers.

Bessera elegans was introduced into Europe many years ago, and has been described under two or three different names based on slight variations in the color of the flowers. Very little has been heard of it, however, in cultivation of late years until a year or two ago, when one of the seedsmen of this city succeeded in obtaining a supply of the bulbs, which are now offered for sale.

Our illustration is made from a plant furnished for the purpose by Mr. Atkinson, gardener to John L. Gardener, Esq., of Brookline, Massachusetts.

New Orchids.

Cypripedium insigne, var. longisepalum, Rolfe, is a distinct and very remarkable variety of the well-known *C. insigne*, which appeared in a batch of the ordinary form imported by Messrs. F. Sander & Co., of St. Albans. Its chief peculiarity consists in the long and narrow sepals, which measure two and a half inches in length by only one inch in width. The dorsal one is also unspotted and with the white opical area reduced to the smallest dimensions. The lip and petals are normal in character.—*Gardeners' Chronicle*, January 17th, 1891, p. 72.

Cypripedium × Celia, Rolfe.—This is a very pretty hybrid raised in the collection of Wm. S. Kimball, Esq., of Rochester, New York, by Mr. George Savage, probably between *C. Spicerianum* and *C. tonsum*. The record of parentage was unfortunately lost, but there is abundant evidence of the former in the hybrid, while characters of the latter are apparently present in the leaf, dorsal sepal and staminode, if not also in the petals, and it is known that the two species were hybridized together.—*Gardeners' Chronicle*, January 24th, 1891, p. 104.

Dendrobium niveum, Rolfe.—This is the *Dendrobium Macfarlanei*, Rchb., f., which, unfortunately, must bear a new name, there being a species of the same name described seven years earlier by F. Mueller, also from New Guinea, and belonging to the section Aporum. *D. niveum* is a magnificent species, with pure white flowers which measure four and a half inches in diameter. It has again been introduced from New Guinea, this time by Admiral Fairfax.—*Gardeners' Chronicle*, January 24th, 1891, p. 104.

Cypripedium × Berenice, Rolfe, is a fine and handsome hybrid, raised in the collection of Captain Vipan, of Wansford, from *C. Roebelenii*, a variety of *C. Philippinense*, fertilized with the pollen of *C. Lowii*, and thus the first hybrid whose parents both belong to the racemose-flowered group. It is generally intermediate in character, and combines the characters of the two species in a very pleasing manner. The petals are drooping, narrow, over five inches long, and spirally twisted.—*Gardeners' Chronicle*, January 31st, 1891, p. 136.

Restrepia striata, Rolfe.—This is a most distinct and pretty species, with the habit of *R. antennifera* and its allies. Instead of being spotted, however, the lateral sepals are striped with seven sharply defined maroon lines on a yellow ground, the lines being a little narrower than the intervening spaces. It exists in two or three collections, but I am not sure who first introduced it. Schlim met with it and sent home a drawing, but probably no living plants. Messrs. Hugh Low & Co. introduced plants from the Cauca range, in New Granada, which flowered in January, 1890, but at Glasnevin it flowered nearly a year earlier, though whether from the same source I am unable to say. It is a very charming little species.—*Gardeners' Chronicle*, January 31st, 1891, p. 137.

Plant Notes.

Some Recent Portraits.

Monsieur Carrière, in the issue of the *Revue Horticole* for February 1st, figures a Cherry under the name of *Prunus Capuli*, which is occasionally met with in French gardens. It is, we suspect, only a form of *Prunus serotina*, and not the Cherry of western tropical America and Mexico. Judged by the figure, it resembles very much that form of *Prunus serotina* which occurs in some parts of New Mexico and Arizona, and which has usually been referred by American botanists to the Mexican *P. Capuli* of De Candolle, which itself may be found to be not specifically distinct from our common Wild Cherry of the northern states. Unfortunately, sufficient material does not exist in herbaria to determine satisfactorily the specific characters of the Mexican and Central American Cherry, which may be expected, however, to differ from the tree found farther south.

A full-page illustration in the *Gardeners' Chronicle* issued on February 14th is made from a photograph of a field of Daffodils grown in the Scilly Isles, and gives a better idea of the extent and importance of the cultivation there of these flowers than any description could. It appears that in 1887 and 1888 as many as ten tons of flowers, principally Narcissi, were exported from Scilly into England. The business, however, has increased, and is increasing very rapidly, and last year the maximum export of flowers on any one day reached the total of fifteen tons. Such a field of flowers as this picture portrays would be worth a trip across the Atlantic to see.

The colored plate of *The Garden* published on the 14th of February is devoted to a beautiful Mexican Ipomæa, generally known in gardens as *Mina lobata*, a plant remarkable for the structure of the flower, the limb of the corolla being shaped like an oblong five-cornered bag, the base being turned so much upward by the tube as to be hidden from view. The inflorescence is racemose, upright and arranged something in the manner of that of the Borage family; the flower-buds are a bright rich crimson, changing from orange to pale yellow as they open, and as the flowers appear at all stages at the same time produce a charming and unusual effect. *Mina lobata* can be started in a warm house in the spring, and then planted out against a fence or arbor, and will then grow rapidly to the height of twelve or fifteen feet by midsummer and flower profusely. The racemes are usually branched, twelve or eighteen inches long, and sometimes produce thirty or forty flowers, which are each about an inch long. Seeds are produced when the season is long enough, and germinate readily, or the plant can be propagated by cuttings.

Foreign Correspondence.

London Letter.

Auction Sales.—An enormous number of plants of all kinds are now distributed in London by means of public auction sales. A few years ago the only salesman of note was Mr. J. C. Stevens, whose weekly sale in his rooms near Covent Garden Market was limited almost exclusively to Orchids, and generally newly imported plants only. Now Mr. Stevens has two or more sales of Orchids every week, and Messrs. Prothero & Morris have at least the same number of Orchid sales in their rooms at Cheapside. Besides these there are several sales every week of bulbs, Palm-seeds, fruit-trees, Roses, herbaceous

plants and all kinds of hardy trees and shrubs. These are mostly offered by samples sent to the auction rooms, the vendors undertaking to forward the plants direct from their nurseries to the buyers. In this way nurserymen find a ready means of disposing of surplus stocks, and although some of the prices realized are not remunerative to the growers, it frequently happens that higher prices are obtained in the auction rooms than would be asked in the nursery.

Fig. 24.—Bessera elegans.—See page 124.

Great quantities of Orchids have already been disposed of by auction this year notwithstanding the unfavorable weather. *Lælia grandis* was offered by the thousand last week; enormous masses of *Dendrobium Dalhousieanum*, *D. Wardianum*, *Vanda Sanderiana* and other choice tropical East Indian Orchids have also recently found a ready market in the auction rooms. This week brings quantities of newly imported plants of the pretty new *Odontoglossum Noezlianum*, which may be called an orange-red *Mesospinidium vulcanicum*, and is likely to prove a good garden Orchid. There are also other novelties and rarities which will shortly find their way to the auction rooms, but which I am not in a position to name at present. On the whole this means of distributing plants has its advantages both to vendor and purchaser. At the same time it offers an opening to dishonest dealers who prey upon the ignorance of many who attend these sales. We sometimes hear of wonderful things being bought at an auction sale for "a mere song"; but we rarely hear of the heart-breaking disappointment of the purchaser who gets only rubbish for his pains, and, sometimes, big prices. These things, however, must be at auction sales of all kinds.

A Fatal Year.—A winter which will certainly stand out among the bad winters of this century has been destructive not only to many good plants, but has killed off many good men besides. This week we have lost three of the leading lights in the English horticultural world. Mr. John Dominy, who served Messrs. J. Veitch & Sons over forty years, and who raised not only the first, but many of the finest, hybrid Orchids we possess, died suddenly last week, at the age of 75. The genial, clever manager of the Clapton Nurseries, Mr. Frank Casey, fell dead at a railway station only a few days ago, and last Tuesday the venerable secretary of the Gardeners' Benevolent Society, Mr. E. R. Cutler, died suddenly at Wimbledon. The first and third men were ripe in years, and have left behind them a record of good work which will not soon be erased; but Mr. Casey was scarcely beyond the middle age, and died in harness.

Three Good Garden Palms.—*Chamædorea elatior* is a Palm of quite exceptional value. Among the many species of this genus in cultivation it is the only one that may be grown in an ordinary greenhouse temperature. It forms a tuft of bamboo-like green stems, about eight feet or less in height, and each stem bears an elegant head of dark green pinnate leaves. From its habit of throwing up stoloniferous offsets freely from the base, it may be propagated by division in the same way as answers for Rhapis. At the French exhibition,

two years ago, there were some magnificent specimens of this Palm shown from Algeria.

Phœnix Rœbeleni has behaved perfectly in the exceptionally trying conditions that have prevailed during this winter, the plants at Kew being now as healthy as one need wish. I anticipate considerable popularity for this Palm and hope that the quantities of seeds mentioned by Mr. Roebelen, its discoverer in Siam, will soon find their way into gardens. Like the Chamœdorea this Phœnix may be multiplied by means of offsets.

Rhopaloblaste hexandra is an elegant Palm in the way of *Geonoma gracilis*, and, apparently, as easily grown as that popular species. It has been in cultivation some years at Kew, having been obtained from Java. Mr. Bull offered it among his new plants of last year, and published a characteristic figure of a young example in his catalogue. The genus is related to Ptychosperma, and is composed of three species, natives of the Malay Archipelago. *R. hexandra* ultimately forms a stout, erect stem, bearing a wide-spreading head of arching, feathery, pinnate leaves. Plants only a foot high are pretty in foliage and habit. It requires stove treatment.

A Hybrid Brownea.—Several hybrids have been raised in gardens from the cultivated species of Brownea, the best of them being the result of a cross between *B. macrophylla* and *B. grandiceps*. This was raised by the late Mr. Crawfurd, of Lakelands, Cork, and flowered by him several years ago. Mr. Crawfurd had formed a fine collection of Browneas, which, after his death, were divided between the botanic gardens at Glasnevin and Kew. The hybrid above named is now flowering freely in the large Palm House at Kew. The plant is twelve feet high, has large pinnate leaves like those of *B. macrophylla*, and large terminal clusters of salmon-red or flame-colored flowers. The individual flowers are larger than those of *B. grandiceps*, being almost as large as the flower of *Lapageria rosea*. There are about sixty flowers in each head, but they are packed so tightly together that they do not appear to be so numerous. *B. macrophylla* differs from all other Browneas in its habit of producing its large clusters of brilliant red flowers on the stem, never at the ends of the branches. A figure of it was published in *Botanical Magazine* (t. 7033). In *B. grandiceps* the flowers are always terminal. For large tropical houses this hybrid will prove at least as useful as *B. grandiceps*, perhaps the best known of all. The large specimens of Browneas in the Palm House at Kew never miss flowering freely in February and March. Besides those above named we also have in cultivation *B. coccinea*, *B. Ariza*, *B. capitella*, *B. coccinea* × *latifolia*, *B. Ariza* × *grandiceps*, and *B. Leopoldii*.

A tall, single-stemmed plant, long cultivated under the name of *B. princeps*, was flowered by Mr. Crawfurd in 1888. It proved to be a Talisia, a genus of *Sapindaceæ*, very far removed from *Leguminoseæ*, the order to which Brownea belongs. A figure of the Talisia, which Professor Oliver named *T. princeps*, was published in Hooker's *Icones Plantarum* in 1889. It was introduced by Linden many years ago as *Brownea princeps*, and by Loddiges as *B. erecta*. It has also been called *Theophrasta pinnata*. In the Kew Palm House there are a pair of tall specimens, one of which is forty feet high, with a magnificent head of foliage.

London. *W. Watson.*

Cultural Department.

Chrysanthemum Queries.

A FEW weeks ago, Mr. John Thorpe read a paper on Chrysanthemums before the Massachusetts Horticultural Society, and from it we have already made some quotations. After the paper had been read, many of those who heard it made inquiries on various points suggested in the discussion, and Mr. Thorpe replied. We give below a selection from these questions and their answers.

"What is known of the new, early varieties offered by European growers?"

This is a matter of importance to those who have no greenhouses, but it should be said that, with one or two exceptions, the early-flowering varieties raised in Europe have not given satisfaction, because of their inability to withstand the excessive heat of our summers. It will be reasonable to expect a few of the many early varieties offered by Delaux to succeed, but just how many, time and experience alone can tell. The moist and temperate climate of France and England, where Chrysanthemums do well out-of-doors, is very different from ours. If we desire to secure a series of early-flowering varieties, which will withstand the vicissitudes of our climate, we must raise our own seedlings and save none but the sturdy ones which prove their ability to endure our trying weather. Delaux claims that his set will begin to flower as early as July 15th. We have already several pompons that would flower by that date if they only could be induced to grow. What we need is a series beginning to flower not earlier than September 1st, of stout, compact growth, bright, healthy foliage, with good-sized flowers of distinct and desirable colors. M. E. Nichols is a variety having some of these good points; it is a sturdy grower, it has thick, leathery leaves, the flowers are of medium size, but rather undecided in color, and it blooms about October 5th. Harvest Queen is a good white, and so is Madame Lacroix, and they bloom about October 15th; the flowers of the two last named are much better, however, when grown under glass.

"Which is the best early variety for cut flowers for market?"

That depends upon what color is desired. The best white is Jessica, the best yellow Rohallion, followed by Gloriosum five days later, or about October 15th. It is astonishing how much difference five days make in market prices.

"What variety remains longest in perfection?"

Different flowers, according to the time of year. The duration of bloom varies from twelve to twenty days. By judicious selection and special cultivation, Chrysanthemums can be had in bloom from January 1st to December 31st; the blooms probably will not all be of the first quality as to form, size, substance and color as they are when flowered in autumn, but they will have enough good points to make them acceptable. For ten years I have never been without Chrysanthemum flowers. We have only to remember that they are herbaceous plants, which, when they start to grow, keep on until they produce buds and flowers. It should not be inferred, however, that much is gained by this interfering with their natural time of flowering. Strawberries are best in June, and Chrysanthemums are best in November.

"Is it wise to award prize medals for new varieties upon the exhibition of the first flowers, or should awards be deferred until the superior character of the new plant has been established?"

The first year my seedling, Mrs. Cleveland, flowered I considered it a capital prize. It was propagated and sold the following spring, and when it flowered the second year, instead of proving itself a gem of the first water, it fell as low as the third class. Seedlings should always be tested more than one season, and no prize should be awarded to any until its superiority in character and habit is fully established. It is unwise for a grower to offer to the public any new plant or flower until its merits are shown to be greater than those of existing kinds, especially when varieties are so numerous, and in many cases so excellent.

"Is there any remedy for the little insect-hopper that so injures the plants out-of-doors during summer?"

Professor E. V. Riley, of the Department of Agriculture at Washington, has taken a great deal of interest in the investigation of this enemy, which attacks not only Chrysanthemums, but Asters, Golden-Rods and other composites. The female stings the stems of the plants to deposit her eggs, causing a disorganization which is shown by numerous excrescences.

The best preventive I know is a solution of one ounce of bitter aloes in four gallons of water, and with which the plants should be syringed twice a week from July 1st to the middle of August.

"Can the Chinese incurved varieties shown here take rank with those grown in England?"

There are many of the finest old-style, incurved flowers, such as Queen of England, Mrs. Shipman and Princess of Wales, that do not do at all well here, whereas in England they are most popular and give great satisfaction. I have yet to see a really first-class dozen of these kinds in America. Climate must account for this, as we have as much skill and as good appliances as any country has. I have never seen two dozen of these shown on one stand in America that would rank as second, or hardly as third-class in England. The specimen-plants of the old incurved kinds are not equal in quality to the cut flowers. That famous variety, Mrs. Rundle, and the two sports from it, always appear in competitive groups. Two out of the three Rundles will be found in any competition of six varieties, and in nine or more varieties it is almost a certainty that all three will be shown.

"Where did the best twelve Japanese varieties originate—in Japan, America, France, or England?"

Probably the best twelve now are direct importations from Japan, but by next year, or the year after at the farthest,

The Rose-tree of Hildesheim.—See page 122.

twenty-four American-raised seedlings will be in cultivation, that will beat twenty-four from any other country. This is because so many are engaged in raising seedlings and also because the standard of requirements has been raised. There are now a great many seedlings on probation, and if they prove as good as when seen last season, they will give us these additional good varieties.

"What are the very best late kinds to have in flower at Christmas?"

Mrs. Humphreys, Ethel, Mrs. H. J. Jones, and Governor of Guernsey are late-flowering kinds. But it depends largely upon the manipulation of the plants. For example, if the plants are allowed to become very dry in August, and the wood ripens, they will flower by the middle of November; but if they are kept growing, and the wood remains soft several weeks later, they will then flower in December. It is not a question so much as to when the cuttings are taken as it is how continuously they are kept growing after they are rooted, up to, say, eight weeks before they are required to be in flower. Perhaps it would be better to take cuttings later rather than very early of late-flowering kinds.

"What are the best six varieties for market cut flowers?"

I should rather name a hundred, since the grower would doubtless want them coming into the market from September 1st to January 1st, in all the popular colors, such as yellow, white, pink, bronze and red, with a few fancy or parti-colored varieties. Then, as Chrysanthemum flowers last about fifteen days, for the 120 days between September 1st and January 1st it would take eight varieties at least for one color alone; therefore it will be seen that at least thirty or forty sorts are required to fill the bill.

Mr. Thorpe gave the following list of Japanese Chrysanthemums as being of great merit: Twelve from Japan direct—W. H. Lincoln, Volunteer, Lilian B. Bird, Mrs. Alpheus Hardy, Louis Boehmer, Kioto, Mr. H. Cannell, Christmas Eve, E. G. Hill, Comte de Germiny, G. F. Moseman, Robert Bottomley.

Twelve American seedling varieties—Violet Rose, Mrs. M. J. Thomas, Minnie Wanamaker, Harry E. Widener, Ada Spaulding, Carrie Denny, G. P. Rawson, Excellent, Maunda, Miss M. Wheeler, Mrs. Bowen, and Cyclone.

Twelve varieties raised in France—Belle Paule, Ceres, Etoile de Lyon, Margot, L'Incomparable, M. Bernard, Roi des Japonais, Madame C. Audiguier, Val d'Andorre, Boule d'Or, Alcyon, Jeanne Delaux.

Twelve varieties raised in England—Elaine, Eynsford White, Sunflower, Martha Harding, Joseph Mahood, Fair Maid of Guernsey, Carew Underwood, James Salter, Mrs. Falconer Jameson, W. Mathews, Stanstead Surprise, William Robinson.

Hardy Plants from Seed.

NEARLY all hardy plants may be raised from seed in the open air, with greater or less satisfaction. For the mere purpose of keeping up stock of easily managed, vigorous kinds, it is in no way necessary to incur the additional labor of raising them under glass; generally speaking, they require as much labor and attention, when so treated, as more expensive plants. With a numerous group, such as Delphiniums, which rarely bloom the first year from seed, and some, such as the herbaceous Pæonies, that are slow to germinate, even when raised under glass, there is really nothing to gain, in point of time, by raising them in a more troublesome way; and unless we have reason to suspect that, on account of long keeping, the vitality of the seeds is low, and that they would therefore have a better chance under glass, all of them may be sown out-of-doors. New and rare subjects, however, and choice species and varieties, that it is desirable to make the most of, had better be sown under glass; and some Pentstemons, late-blooming Phloxes, Œnotheras, Verbascums and Gaillardias, which, if sown early, bloom the first year. For sowing out-of-doors a sheltered border should be chosen, and one that is easily accessible from all sides. The seeds should be sown thinly and watered carefully. Seedlings may be transferred to nursery beds as soon as they are large enough to handle.

The luxury of a hot-bed, or even a cold frame, for raising plants from seeds, has many advantages, and will well repay any who can afford it. If a hot-bed is used, a cold frame should be handy to place the pots or pans of seedlings in as fast as they germinate, because the close conditions essential to germination are detrimental to the healthy condition of the seedlings after that stage. Sand or coal-ashes are equally good as a plunging medium in hot-beds. Good light loam is the best soil to use, from which the rough portion has been separated by a coarse sieve; and this refuse is very useful to place over the drainage. The soil should be pressed firmly, and the seeds, except the largest, covered thinly. The frame had better be kept rather close, and some kind of shading used, instead of much airing, which only dries up the soil. When the weather becomes settled in May, seedlings, as fast as they can be handled, may be planted in nursery beds; excepting only such as grow slowly, or Alpine garden subjects, which had better be put in shallow boxes, and kept where they can be cared for. These nursery beds should be covered with light litter or Pine-leaves the first winter.

Wellesley, Mass. *T. D. Hatfield.*

Tree Ferns.

THE Ferns of arborescent growth include many of the most noble and graceful species in this vast order, and wherever sufficient space is at command some Tree Ferns should find a place. Many of these plants may be grown in a moderate temperature; in fact, some few of them will stand a slight frost without injury if they have been grown in a low temperature generally, so that the fronds are of stout texture. Their chief requirement as to soil is a good open mixture, and this may be composed of about equal portions of peat and loam, or a little excess of peat may be used if the loam is heavy, and sufficient coarse sand may be added to make it quite gritty. The material should be quite coarse and fibrous, for, although Tree Ferns require firm potting, the soil should always retain its open character, and sufficient drainage material of either pot-sherds or charcoal, or both, should be used. If the specimens have attained considerable size the growth will be strengthened by tying sphagnum moss around the trunk from the surface of the soil upward, and the moss being kept damp will soon induce a growth of fresh roots all around the trunk, and in a short time these will form a perfect mat in the moss, and then find their way down into the soil.

During the summer syringing overhead is practiced by some growers, but if the atmosphere of the house is kept moist by frequently dampening the floor end underneath the benches the syringing will not be essential; and, indeed, unless done by an experienced man, it had better be neglected altogether. Among the species to which the name of Tree Ferns may properly be applied the following are a few of the notably handsome plants which are easy to manage:

Dicksonia antarctica.—This is one of the most widely known of its class, and deservedly so, for, though specially interesting when it has attained large size, it is also remarkably handsome while small. It has tripinnate leaves of dark green color, the upper side being quite glossy while the lower is much lighter in color. In Australia it sometimes attains a height of thirty to thirty-five feet, and is crowned with a majestic head of fronds that are ten to twelve feet in length. Many stems, some of them of quite large size, have been imported from time to time, and among these may be mentioned some nice plants about ten feet in height, which can now be seen in Horticultural Hall, Fairmount Park, Philadelphia. These have been established there for several years, and are now a marked feature of the Fern-house.

D. squarrosa.—This is much smaller than the preceding and forms a more slender stem, which has the peculiarity of sometimes branching when old by means of young plants formed on the stem. It produces fronds from three to six feet long and somewhat rigid in habit, so that they stand out at right angles to the stem. The fronds are tripinnate and dark green.

D. Schiedei.—This most graceful Fern may be more easily recognized by many under its old name of *Cibotium Schiedei*, and it is one of the most attractive and elegant Tree Ferns in cultivation. It makes a stem but slowly, and consequently is not likely to outgrow its quarters in that respect very soon, but the fronds are very large, often reaching a length of ten feet or more. They are bipinnate, the pinnules being long and pendulous, light green above and glaucous beneath, and the crown of the plant as well as the stipes are thickly covered with long silky brown hairs.

The Alsophilas comprise another fine group of arborescent Ferns, many of which are quite large growers, and several of them suitable for cool-house culture. The most widely known of this genus is *A. australis*, a fine greenhouse Fern, with bipinnate fronds that sometimes attain a length of twenty-five to thirty feet. It is a rapid grower and requires an abundance of water, especially if placed out-doors in the summer, for which purpose it is well adapted if it is placed where it can be protected from the sun.

A. ACULEATA.—This is a smaller Fern, with a stem some five or six feet in height, armed with long, sharp thorns, as are also the stipes. Its fronds are tripinnate, and of a size proportionate to that of the stem. It comes from tropical America, and makes better growth when cultivated in a warm house.

A. EXCELSA is another of the large species, and reaches a height of thirty feet. It bears some resemblance to *A. australis* in general outline, but is even more hardy than that fine species. Its fronds have much substance, and it may be used out-of-doors in summer, as well as for house-decoration.

A. REBECCÆ is of much more recent introduction than those named above. It is a cool-house species from Australia. Its fronds are bipinnate and dark green in color, and the plant attains a height of about eight feet.

THE CYATHEAS include such good plants as *C. dealbata*, with large fronds that are quite finely cut and almost white beneath; *C. medullaris*, a very large Fern, with fronds ten to twelve feet long, stipes almost black, and the crown of the plant covered with black chaffy hairs; a good plant for cool treatment; *C. Dregei* and *C. princeps*.

As has been said, young plants of *Dicksonia antarctica* are suitable for even a Fern-house of very modest dimensions, but there are small Tree-ferns besides well suited to small houses. Some of the best of these are *Bleechium Brasiliense*, *Lomaria gibba* and *L. cycadoides*.

Holmesburg, Pa. *W. H. Taplin.*

Clianthus Dampieri.

THIS plant, also known as the Australian Glory-pea, is a truly beautiful one when in flower, but, as is well-known to all who have attempted its cultivation, there could scarcely be a more fickle subject. Much has been written on the treatment of this plant, and, curiously enough, those who have succeeded with it are all equally emphatic in commending their several methods, which, it is hardly necessary to add, are widely different. It is not because I have discovered any new way of treating this plant, but from the fact that seeds were sown last September in a cool greenhouse, and a plant produced therefrom is now in flower, that I am tempted to record the fact that others may do likewise. The seeds were few in number, and were sown in a four-inch pot, and when the pot was full of roots the ball of soil, without any disturbance, was shifted into a six-inch pot, and as red spider does not seem to have attacked the plant, it is still in good health, and other flowers are showing for future display. To those unacquainted with the plant, it may be well to explain that the prevailing color of the flower is bright red, the lower part or keel bearing a strong resemblance to a lobster's claw, to which it has often been likened. The upper half of the flower is almost black, with a small blotch of white. This is the typical plant. There is also a variety known as *C. marginatus*, in which the color of the claw is white, margined with red, giving the plant a most distinct appearance. An excellent colored figure of this variety appeared in the London *Garden* a year ago. It appears that Louis Viewig, of Quedlinburg, Prussia, has hit upon the plan of grafting *C. Dampieri* upon the much hardier and more easily grown *C. punicens*, which gives it a much better constitution and longer life. Grafted plants are offered at very low prices, and should be worth the notice of some of our enterprising nurserymen and seedsmen. It may also be remarked that the white-margined variety has been named "Deutsche Flagge," the colors being red, white and black. Those who attempt the cultivation of the Clianthus should use light soil composed of loam, leaf-mold, a little charcoal, and enough sand to make the soil porous, and when potting it on they should take care not to injure a single root-fibre. Gareful attention also should be given to the watering. *Clianthus punicens* is itself a very beautiful plant. Years ago I remember to have seen a fine plant growing out-of-doors in a sheltered position on a south wall, which every summer flowered profusely, and was a beautiful object. *C. punicens* could not be grown here in New England in this way, but is well worth trying in a greenhouse, however limited the space, as it could be planted out and trained up the rafters, and if freely syringed red spider could be kept away much more easily than would be the case with *C. Dampieri*, the foliage of the latter being densely clothed with a woolly covering, and therefore an excellent refuge for this minute pest.

South Lancaster, Mass. *O. O.*

Chrysanthemums.—Mine are now well established in three-inch pots, and are breaking after the first stop. I shall repot about the 20th of March into six-inch pots, and about the first of April shall remove into a cold frame, which will be kept only warm enough to be frost-proof. My plants are thus kept healthy and stocky, and are thoroughly hardened by the time I put them into ten-inch and twelve-inch pots, the final size, in May. For the last shift I use good heavy loam, previously enriched, with a sprinkling of oyster-shells, as our soil is almost devoid of lime; coal ashes answer just as well. I return the plants to the frames so as to be able to cover them with sashes in case of heavy rain, which soddens and sours the soil.

Wellesley, Mass. *T. D. H.*

Lilium Wallichianum superbum.—The introduction of this superb Lily will again call attention to that group of Indian Lilies of which *L. Nepalense*, *L. Neilgherrense* and *L. Philippinense* are representatives. It is well known to cultivators of Lilies that the members of this group have always been difficult to manage, the trouble being that they are very excitable, delicate in growth, and make but few roots. From information I have just received it is evident that this new variety of *L. Wallichianum* does not manifest the weakness of its relatives. A plant which grows six feet high and carries eleven flowers and requires scarcely any support, is certainly a vigorous one and different from the ordinary run of Indian Lilies. It must be borne in mind that this group will not endure rough treatment, and demands the protection of a greenhouse from September to May. If *L. Wallichianum superbum* ever gets cheap enough for florists to grow in quantity, what a magnificent Easter Lily it will be! The coloring of its immense trumpet-shaped flowers is most beautiful—a rich golden yellow and white inside, bronzy brown and white on the outside.

The type, *L. Wallichianum*, was introduced into England forty years ago.

Pearl River, N. Y. *John Thorpe.*

Euphorbia jacquiniæfolia.—This useful old plant, with its long slender sprays of rich crimson flowers, is very ornamental in the greenhouse now, and for cut flowers it is unsurpassed. It does well with the same treatment as that given to the Poinsettia; in fact, I grow the two on the same bench and treat them exactly alike, except that the Euphorbia is not cut back quite so severely as the Poinsettia, although, while growing, I pinch it back quite freely to make it more bushy.

Chorizema cordatum.—This is a showy greenhouse plant with Pea-shaped flowers, colored orange and red, and produced freely in long terminal racemes. It flowers in early spring, and delights in a light rich soil, with plenty of water while growing. When it has made its growth it should be kept a little drier until fall, with abundant sunshine to ripen the wood. When repotted in autumn it should be cut back quite severely and set in a warm, sunny position. As soon as the new growth begins a good supply of water will again be required.

Maywood, N. J. *J. S. T.*

Correspondence.

The Wissahickon Woods.

To the Editor of GARDEN AND FOREST:

Sir.—The articles that have appeared in GARDEN AND FOREST from time to time, on communal forests, and the care and management of municipal forests, have been instructive and interesting to American readers. The land tenure here is so different from that prevailing in Europe that it might be very difficult, if not impossible, for the Government to own and cultivate land in the older states. If the Government undertook to buy the holdings of the people a great expenditure of money must be made.

All municipalities require open-air spaces. Philadelphia enjoys excellent facilities in this respect. Fairmount Park was created (1) for the protection of the water-supply of the city, (2) for the maintenance and preservation of pastoral scenery, and (3) as a pleasure resort. Philadelphia's only available water-supply is derived from the Schuylkill River. Pumping stations and subsidence reservoirs have been constructed from time to time to utilize this supply. The growth of the city along the river front, and the erection of large woolen and cotton works, have seriously impaired the supply. The present Fairmount Park was secured as a preventive measure against the pollution of the streams within the county limits. Two thousand seven hundred acres of land were thus set aside; still the purity of the water was found to be below the standard. The cause was sought for. The Wissahickon, the main affluent of the Schuylkill within the county limits, was found at fault. A belt of land five miles long on either side of the stream was secured. All the mills, nearly twenty in number, were purchased and removed.

The Wissahickon is one of the most romantic of American streams. The slopes on each side are high and abrupt. "Self-guarded by these rock battlements, it retains that primeval character, in which, let us hope, it will always be preserved. Along its banks trees and vines hang down to the water's edge, and numerous springs drip from the rocks. Its unbroken quiet, its dense woodland, its Pine-crowned hills, its sunless recesses and sense of separation from the outer world, contrast strongly with the broad meadows, the open-flowing river, and the bright sunshine, which characterizes the adjacent region. It is a chosen spot."

If left open to the public as it now is, without adequate police supervision, its natural beauty must soon fade. The younger growth will be tramped down, and in a few years its charm will be gone. A systematic care of these densely wooded hills, and a wise financial management, will preserve this most natural of all spots to the country forever. A large amount of the present growth has reached maturity. A careful and scientific thinning might be of the greatest advantage. Some system might be carried on ; regeneration under shelter wood, either in compartments or single trees, or a combination of seedling and coppice forest. At the present time, when a tree falls, that is the end ; no other tree takes its place. This should not be so, for in a very few years there will be no woodland left.

If we can profit by European experience, this forest might be so managed as to pay the expenses of its maintenance. Mr. Pinchot, in his excellent article in Garden and Forest (vol. iii., p. 398), says : "But the interest of the citizens of Zurich in the Sihlwald is far from being centred in the substantial return which it makes to the city treasury. Its second interest lies in the qualities of a great city park, which it unquestionably presents. It has been the wise policy of Herr Meister to maintain throughout the forest a network of well-kept roads and paths, to place occasional benches along them, to keep the beauty of the landscape unharmed, and in general to make the Sihlwald thoroughly and pleasantly accessible. In so doing he has secured its future by demonstrating to the people the utility and value of their ownership. The question naturally arises whether the multiform advantages to be derived from such a city forest in Switzerland might not be enjoyed in America ?"

Why not make the Wissahickon woods the municipal forest of the city of Philadelphia ? Let it become the first American Sihlwald. It will be of inestimable advantage to the city. The water-supply will remain pure, and it will yield a revenue large enough to meet the expenditures for maintenance and salaries of expert foresters. A great advantage would be gained even if no surplus is derived. By united action on the part of the people the city fathers might no doubt be convinced of the benefit to be derived from such a forest. A great expenditure need not be made at first, and in a few years the forest might become self-supporting. A demonstration here of the advantages derived from a scientific supervision of a municipal forest would not only prove a blessing to Philadelphia, but might serve as a stimulus to similar movements throughout the country.

Philadelphia, Pa. *J. W. Harshberger.*

Winter Flowers in California.

To the Editor of Garden and Forest:

Sir.—The few words from Mr. Purdy in your last issue prompt me to send some notes of the plants that are blooming in my yard this last day of winter. There are eighty-eight in all, and since New Year's on almost any day fifty plants might have been counted in flower, though only in a few cases freely blooming. The finest single plant at present is *Doronicum Caucasicum*, with the clear yellow of its ray and disk, and the fresh pale green of its leaves. After this comes *Aubrietia purpurea*, then *Triteleia uniflora* with its variety Alba, and a white-flowering Allium, which I suppose to be *A. Neapolitanum*. Another mass of white is made by a wide-spreading *Iberis sempervirens* and a group of Empress Candytuft, while *Phlox subulata*, with its white variety thrown into contact, spreads over the ground like heavy splashes of color from a brush, and makes a pretty edging to several beds. *Phlox amœna*, slightly taller than *P. subulata*, would doubtless make quite as attractive a plant as the latter, but the specimen I have has not had time to grow so as to exhibit its full value. *Lobelia Erinus* and the Heliotropes are flowering with nothing but the eaves of a gable to protect them. There is always sufficient frost here to kill these plants when exposed. This winter, however, has been a mild one, no snow appearing on either of the ridge-walls that enclose our valley until this month, and then only upon the highest elevation of the one to the eastward, Mount Hamilton, the site of the Lick Observatory. This forbearance on the part of the weather has perhaps saved a rectangular mass of thirty by thirty-six inches of *Mahernia odorata*, just now completely covered with buds. This plant is really a trailer, and, it seems to me, would appear well falling over a wall, or down a stony incline. The Hellebore does well here without protection, and many kinds of Oxalis would certainly pass the winter unharmed. One plant of *O. cernua* was somewhat affected by frost last month, but has now nearly recovered, while other plants of the same species seem not to have been touched. *Teucrium frutescens* is a beautiful plant of a gray-green aspect, the upper part of its leaves very dark green, the lower part, with the stems, silvery, and the flowers pale blue. Over the plant I have is cast the spray and golden balls of a variegated *Coronilla glauca*, and the combination is not inharmonious.

Six of the plants in flower, the Ox-eye Daisy being one of them, merely show a few flowers, probably left over from the previous season, but all the rest are making their regular spring display. Several plants are already out of flower—the white and yellow Crocus, the Snowdrop, Winter Aconite and *Phlox procumbens*, while the Narcissi are rushing rapidly through their too short season.

With favorable weather *Alyssum Wiersbeckii* will, within a week, eclipse all other yellows with its abundant bloom, and the Peach, whose branches touch the house-wall, will have every twig decorated with rosy blossoms. This Peach-tree loses all of its leaves by a fungal, or insect attack, early in the spring, and is afterward reclothed, the second dress being retained well into winter, and the last leaves falling unfaded about the first of January.

One word is needed for the Correa, which is now seen at its best. A lady, who yesterday saw it for the first time, exclaimed, "Why, it is really finer than the Fuchsia," and she came, too, from Santa Cruz, where the Fuchsia ranks with the showiest of the garden shrubs, and is a year-long bloomer. Though my specimen was bought for *C. alba*, it is clearly not that species, as its flowers are pendent, rose-colored without, paler within, and its truncate calyx, though with a somewhat irregular border, has no distinct teeth. The flowers of *C. speciosa* are erect, and the pendent ones of *C. virens* are green, while *C. pulchella* has scarlet flowers, so that it is hard to identify my plant. But, whatever its name, its beauty is something to be thankful for during these last winter days even in California.

Santa Clara, Cal. *B. P. Leeds.*

An Ancient Sunflower.

To the Editor of Garden and Forest:

Sir.—My horticultural dictionary tells me that the Sunflowers are "natives for the most part of North America, although a few are found in Peru and Chili." Yet in an article by a learned German author, recently published in the *Deutsche Rundschau*, I read that there is a window in the apse of the Church of St. Remy, at Rheims, which dates from the twelfth century, and on which the Virgin Mary and St. John are represented standing beside the cross and wearing halos, around whose outer edges are pictured flowers of the Helianthus, "all turning toward the Saviour, their true sun." Can you tell me what flower it may be which thus resembles the Helianthus closely enough to be mistaken for it and could have been familiar to Frenchmen of the twelfth century ? I cannot believe that the writer can have mistaken for a glass-painting of so archaic a period as the twelfth century one produced at the much later time when, it seems, the true Sunflowers were introduced into Europe.

Philadelphia. *L. H. G.*

Periodical Literature.

An article on "The Flora of the Desert of Atacama," written by Mr. Thomas Morong and published in the February *Bulletin of the Torrey Botanical Club*, is especially interesting to the general reader from the facts it gives with regard to the way in which Nature adapts her products for life under the most unfavorable conditions. "It seems," says the author, "like a contradiction in terms to speak of a desert vegetation, and especially one upon a territory so bleak and desolate as the Atacama, which is distinguished by the number of its hideously barren hills of rock and its sandy wastes. And yet this desert bears a flora quite extensive and very interesting in its character. Over 500 species of plants have been gathered within its borders, and probably as many more might be detected upon a close research. One naturally wonders by what chance such a flora can be brought into existence and how it

can live after being once started. In explanation, it must be said that this region is not absolutely rainless, although it is nearly so. There is an occasional winter rain, or rarely two or three showers in the course of a winter, occurring at long intervals. Generally such rains are barely enough to moisten the ground, but that little is sufficient to cause the seeds, which are lying dormant in the sand, or the bulbs beneath the ground, to germinate. Once up, the seedling is kept alive by the dews which fall nightly upon the earth, and by the mists that hang around the hills every morning in the winter and spring-time. In this way these growths obtain moisture enough to enable them to reach maturity. Besides this the Atacaman plants have acquired several peculiarities which admirably adapt them to their conditions of life. One of these lies in the power of the seeds to live for many years in the dry sand without germinating. They have been known to retain their vitality for ten years and then to sprout at the touch of rain." Microscopic investigations show that such seeds have a "special weather-protection." They prove in every case to have "unusually thick walls and a copious supply of albumen around the embryo. . . . . While seeds are thus fortified against protracted drought, tubers and bulbs are equally well equipped by the large amount of water or milk which they store up. I found many of the bulbs that I collected so full of juice that I could squeeze it out in a stream by hand. Another peculiarity of the herbaceous flora evidently acquired is the early age at which the plants begin to flower and fructify. As if aware that they have only an ephemeral life, and that what they have to do must be done quickly, they are scarcely above ground before they put forth blossoms. Many species may be seen in flower when hardly an inch in height, and go on flowering until they reach the stature of two or three feet—if they can survive so long, I was continually deceived by this habit, naturally supposing that the wee things must be different in species from the plants that I had seen elsewhere only as tall and robust when in flower. A little more experience, however, convinced me that these Liliputians were merely taking time by the forelock.

"Still another adaptation is the extraordinary number of seeds formed by many plants and scattered over the soil in which they grow. This habit is not confined to species which usually yield great numbers of seeds, but seems common to all the desert flora. Thus a little Violet which seldom attains a height of three inches, common about Caldera, often exhibits from thirty to forty pods full of seeds upon a single plant.

"One other apparent adaptation deserves mention. It is said that a majority of the desert plants are shrubs, or, at least, are suffruticose, and this accords with my own observation. I found that such growths are in the habit of shedding their leaves in the summer instead of winter, thus reversing the ordinary process of nature. By this means they reduce their vital expenditure to a minimum at a season when they need to husband their utmost strength in order to resist continued dryness. This leaves them free to exert their full powers at a period when they are most likely to imbibe the revivifying moisture. Aided in this by their thick, long and knotty roots, and close, non-evaporating bark, these shrubs, which seem to be nothing but dead stocks in the summer, can withstand even several years of drought."

Many of the desert plants which Mr. Morong describes are curiously grotesque in habit, but bear very beautiful flowers. Such is *Cynanctum viride*, an Asclepiadaceous shrub which lies close against the sides of rocks; "the stock, which manages to survive the summer, is short and stumpy, with a thick head like an old Pollard Willow, from which it sends out new green shoots whenever the winter rain falls." An Evening Primrose (*Œnothera Coquimbensis*) commences to flower "when not much larger than a needle, continuing the process till it is two feet high." A Calendrinia is commonly called the "Guanaco's foot," from the resemblance of its leaves in shape to the hoof of the animal; "this elegant flower throws up a tall branching stem, each branch bearing on long naked peduncles several large and brilliant purple blossoms, a conspicuous object upon the desert. . . . In clumps around which the sand is often heaped in ridges as if against a wall occurred an odd-looking, yellow-flowered shrub of the *Apocyneæ* (*Skytanthus acutus*), popularly named *Cuerno de cabra*, or Goat's horn, from the singular habit which its long, pointed follicles have of twisting themselves into the shape of a pair of goat's horns. The resemblance is so exact that every one calls them by that name at first sight. In similar situations is found an Ephedra, vulgarly '*Pingo-pingo*,' the naked sharp-pronged stems of which seem just in place in such a region. We frequently rode through mounds of sand in which clumps of these two shrubs were completely buried."

The Cacti of this region, says Mr. Morong, are among the most curious he had ever seen. "The most noticeable of all belongs to a genus created by Philippi, and is, I believe, confined to this desert, named *Eulychnia breviflora*. It throws up from a cluster of roots numerous columnar stalks about as large in diameter as a man's arm, and armed with innumerable long, unequal, needle-like spines. The flower is on the summit of the stalk, not unlike a large cup in aspect, the lower part of which is covered with crinkly velvet hairs of a lavender hue, above which rises a single row of stiff white petals, including a host of delicate stamens. Another Cactus of the Melon variety, not over eight inches high, and not unlike a pineapple in shape, has its spines twisted about the stem, so that they resemble a bird's nest, inside of which the small red flowers hide like eggs." An Alstroemeria, "which exhibited great lilac flowers, the petals streaked with blue veins and yellow blotches"; a shrubby Euphorbia, five or six feet in height, with large white flowers and an excessive amount of milky juice; a delicate vine, *Tropæolum tricolor*, "which climbs upon shrubs in thick masses, profusely decorated with spurred corollas, whose bright tints of orange, red and blue offer a standing invitation to all the humming-birds that live in its vicinity," and *Euphorbia Copiapina* are among the other interesting plants described as inhabiting different parts of the Peruvian desert. The last-named "has a multitude of short stems which rise directly from a huge underground tuber, and lie in a circle upon the ground. The stems, leaves and flowers are lurid in hue, as if burnt by a tropical sun, and the tuber, in aspect much like a big turnip, is full of milk. Other things might perish in that rainless climate, but such a tuber would be preserved for many years in the dry sand."

Notes.

Stachys tuberifera, the Chinese vegetable introduced a few years ago, is said to be growing in favor where it has been tried in England.

We have received an excellent photograph of a striking variety of *Dendrobium nobile* which is now in bloom in the houses of Mr. Charles J. Carpinder, New Brunswick, New Jersey. Its flowers are said to be much larger than those of the type, and the coloring is remarkably distinct and beautiful.

The cultivation of the Pecan is said to be increasing in Texas every year. A farmer near Fort Worth has just planted a grove of forty acres. The demand for the best variety of Texan nuts seems to be unlimited, and the trees will probably grow much more rapidly under cultivation than they do when left wild. Single trees have been known to earn for their owners from $40 to $80 a year.

In his famous "Natural History of Selborne," first published in 1789, Gilbert White speaks of a vast increase in the production and consumption of vegetables as having occurred within the memory of people then but middle-aged, and he adds: "Potatoes have prevailed in this little district by means of premiums within these twenty years only, and are much esteemed here now by the poor, who would scarcely have ventured to taste them in the last reign."

According to Mr. S. D. Willard, the best-paying Pears during two years past have been the Bartlett, Duchess and Kieffer, the latter excelling all as a profitable orchard sort. One grower with 214 trees on little more than an acre received a total of more than $3,000 for three successful crops, and this last season's yield brought $1,313.50. No pear is more rapidly gaining favor as a canning fruit, its elegant appearance always giving it a good sale. So far the tree has been free from blight.

The memorial stones in Japanese grave-yards, says Sir Edwin Arnold, stand very close together, for, as a rule, only the ashes of the dead are interred. On the stone are inscribed not the names that had been borne in life, but some appellation, most often fancifully poetic, conferred by the priests after death. At the foot of the stone a little cup is hollowed out to contain water in case the spirit should return and wish to drink; and on either side stands a Bamboo joint containing sprigs of the *Shikimi* or Evergreen Anise (*Illicium religiosum*).

At a small party given recently in Indianapolis, the *Indianapolis Tribune* says that the hostess departed from the customary serving of ices in glasses, and had them in real calla lilies. The large spadix was removed and the flower contained quite as much ice as the ordinary receptacle. When the cup so filled was laid on an exquisite plate the effect was very attractive. Callas filled with bunches of sweet English

violets make a beautiful decoration, when piled in pyramid form on the centre of a dinner-table. They are also equally pretty placed at each plate.

The so-called "military zone" which encircles Paris is a strip of ground about 2,500 feet in width lying between the outer base of the old fortifications and the populous suburbs which have grown up during recent years. No one is allowed to build upon this strip, and for the most part it is occupied by market-gardens, which play a large part in supplying food to the great city. As its value for building purposes has, however, become very great, and as the present military governor of Paris favors the erection of a new chain of forts beyond the suburbs, it is possible that these fertile gardens may soon give place to solid blocks of houses.

The *Journal of Horticulture* speaks a good word for *Gypsophila paniculata*, not because it is a showy plant, but because of the value of its spray of minute flowers in giving lightness and elegance to bouquets. It is perfectly hardy here, making a long fleshy root, and when once established it will take care of itself for years. There are other kinds of perennial Gypsophilas which are valuable for this same purpose, and the little annual *G. muralis* is also most useful. This last plant is particularly suitable to use in small vases of Sweet Peas, as it seems to float about the flowers like a mist, and adds to their color an airy grace which can be secured in no other way.

"If the art of gardening," once wrote the poet Schiller, "is at last to turn back from her extravagances and rest with her other sisters, it is, above everything, necessary to have clearly before you what you require. . . . If this is done, there will be found, in all probability, a very good middle course between the formality of French gardening taste and the lawless freedom of the so-called English style. . . . It is certainly tasteless and inconsistent to desire to encompass the world with a garden-wall, but very practicable and reasonable to make a garden, satisfying all the demands of a good husbandman into a whole which shall seem characteristic alike to the eye, the heart and the understanding."

In the "Thoughts" of the French writer Joubert, published near the beginning of this century, we read the following intelligent comment upon the desirability of introducing at times a formal element into gardening art: "When a regular building commands the garden which surrounds it, it ought, so to say, to radiate regularity by throwing itself round itself to all distances whence it can be easily seen. It is a centre, and the centre ought to be in harmony with all points of the circumference, which is itself nothing but the development of a central point." There is a little exaggeration in the phrase which follows, yet we have seen instances where it would not be too severe: "Those irregular gardens," says Joubert, "which we call English gardens, require a labyrinth for the dwelling."

Last week the Judiciary Committee of the Senate of the state of Massachusetts gave a hearing to the advocates of the bill for the Preservation of Beautiful and Historic Places upon which we have before commented. Strong addresses were made in favor of the bill, and it received a hearty endorsement from the Appalachian Club, the State Horticultural Society and many eminent men and women. A letter was read from the poet Whittier, who said: "The movement is made none too soon. Barbarism, vandalism and greed have had their own bad way too long, and have done, and are still doing, irreparable mischief. Access to our seaboard is becoming difficult. Some of our best beaches are desecrated. Poison water gas is killing fine old shade-trees in our villages. It is time to call a halt."

Special Agent Andrew Cauldwell writes to the Commissioner of the General Land Office that the Trustees of the "Kaweah Colony" have been arrested for cutting timber in the Sequoia National Park created under Acts of Congress last year. Owing to the heavy snow-storms no trees have been cut since the first of December, but there is a possibility that operations will be renewed when the snow melts. The Agent has had copies of the rules for the government of these reservations posted in conspicuous places on all the roads leading to them, and he promises to use every means in his power to protect them from trespass until a guard from the army can be stationed there. The trial of the arrested trespassers takes place next month, and if they are proved guilty their prompt conviction would probably prevent any further depredation upon the timber of these reservations.

An English correspondent writes that *Rhododendron arboreum, R. grande* (*argenteum*) and *R. Nilagericum* are now magnificently in flower at Kew. The first-named is represented by a pyramid of foliage twelve feet high, studded with hundreds of bunches of brilliant crimson flowers; *R. grande* forms a tall flat-topped shrub or small tree, with large leaves, silvery on the under side, and huge trusses of large bell-flowers, which are rose-red in bud, ivory white when open, with a blotch of dull crimson at the bottom of the bell. *R. Nilagiricum* is like *R. arboreum*, but the flowers are rose-colored. *Camellia reticulata* is again a gorgeous picture of flowers, the fog having made no apparent difference to this species, although the garden Camellias have suffered more or less severely from its effects. There is no Camellia equal to this for ornament, all the others looking stiff and artificial in comparison.

The expression of a desire to own "a small house and a large garden" has been attributed to many writers, but the credit really belongs to Abraham Cowley, who lived from 1618 to 1667. In a letter to John Evelyn he wrote: "I never had any other desire so strong, and so like to covetousness, as that one which I have had always, that I might be master at last of a small house and a large garden, with very moderate conveniences joined to them, and there dedicate the remainder of my life only to the culture of them and the study of nature. But several accidents of my ill fortune have disappointed me hitherto, and do still, of that felicity; for though I have made the first and hardest step to it, by abandoning all ambitions and hopes in this world, and by retiring from the noise of all business and almost all company, yet I stick still in the inn of a hired house and garden among weeds and rubbish; and without that pleasantest work of human industry, the improvement of something which we call (not very properly, but yet we call) our own. I am gone out from Sodom, but I am not yet arrived at my little Zoar."

The news comes very unexpectedly that Maximowicz, one of the most judicious and accomplished systematic botanists of our time, and the great authority on the plants of eastern Asia, died in St. Petersburg, where he was the keeper of the Imperial Gardens, on the 16th of last month. His career began many years ago with a long journey in Manchooria, of which he made a careful botanical examination. He published the botanical results of this journey in St. Petersburg in 1859 in a stout quarto volume under the title of *Primitæ Floræ Amurensis*, with illustrations made from drawings by his own hand. Later, Maximowicz traveled in Japan, where he made large botanical collections which have been distributed among the principal herbaria of the world and have thrown the best light on the flora of that empire, which Maximowicz has studied assiduously for years with the intention of writing a comprehensive Japanese Flora. A vast amount of preliminary investigation was done toward this work which, however, Maximowicz, overwhelmed with the richness of the collections which for years have been poured in upon him by a multitude of Russian travelers in the little-known regions of central and western Asia and which no one else could work up so well, never saw his way to begin. His labors, however, in this field will lighten the burden of the botanist who undertakes to prepare a Flora of Japan and who will find the best sources of information in the critical notes which Maximowicz has published from time to time since 1866 under the title of *Diagnoses Plantarum Novarum Japoniæ et Manchuriæ*, and in which he has described many new species of plants and elaborated many large and difficult genera. Other important works from his pen are monographs of the Rhododendrons, the Hydrangeas and the Buckthorns of eastern Asia. Maximowicz wrote in Latin or German, but he was master of English as well, which, strangely enough, he learned on the Amour River, and the letters with which he favored his American correspondents were remarkable for their terseness and accuracy of expression. His death leaves a serious gap in the small group of systematic botanists of the first class.

Catalogues Received.

Alfred E. Cole, Plainfield, N. J.; Garden, Field and Flower Seeds, Plants, Bulbs, etc.—W. H. Cornish & Co., Newburgh, N. Y.; Plants, Garden and Flower Seeds.—John Gardiner & Co., 21 N. 13th St., Philadelphia, Pa.; Flower and Vegetable Seeds, Poultry.—G. W. Pressey, Hammonton, N. J.; Hammonton Incubator.—W. C. Jennison, Natick, Mass.; Flower Seeds, Hardy Plants, etc.—Fred W. Kelsey, 145 Broadway, New York; Hardy Trees, Shrubs, etc.—Samuel C. Moon, Morrisville, Bucks Co., Pa.; Ornamental Trees, Plants, Vines, Fruits, etc.—J. C. Vaughan, Chicago, Ill.; Flower Seeds, Spring Bulbs, Hardy Plants.—Thos. S. Ware, Hale Farm Nurseries, Tottenham, London, Eng.; Hardy Perennials and Alpine Plants, Hardy Climbing Plants, Hardy Florists' Flowers, Pæonies, Hardy Ferns, etc.

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The Silver Maple.

THE Silver Maple is one of the largest and most beautiful trees in a genus peculiar for the beauty of its species. To many people, perhaps, who know it only as a shade or street-tree, the Silver Maple does not always appear to be a handsome or desirable tree. Planted, as it has been very generally, for such purposes it often has a weak and overgrown appearance, as if it had outgrown its strength; the branches are brittle and easily broken by wind and snow, the foliage is often thin, and the leaves fall early. This is the Silver Maple to people who know it in towns only and who see a tree in the wrong place, and where all the conditions are unfavorable to the development of its beauty. There are trees, like the Scarlet Maple, the River Birch and our eastern Larch, which seem to flourish as well when they are placed in unnatural conditions of soil and surroundings as in the situations in which they grow naturally, and which thrive as well on a hillside as in their native swamps. The Silver Maple is more fastidious. Unfortunately, it grows very rapidly, and even in unfavorable situations few trees will attain a greater height or a thicker stem in the first forty or fifty years of their existence. It is this rapidity of growth that has made the Silver Maple a favorite with people who are in a hurry to obtain immediate effects and do not care to look very far ahead; and at one time it was planted in the northern states, especially in cities and their suburbs, in immense numbers, without much regard being paid to the fitness of the position selected for it.

The Silver Maple is an inhabitant of low, sandy river-banks, and it is on river-banks only or in low meadows that it displays its beauty; and the lover of trees, if he would see it at its best and would realize what the Silver Maple becomes when all conditions favor it, should float down one of the large streams which flow into the tributaries of the lower Ohio. Here may be seen the river-forests of the Mississippi-basin in their full richness and beauty, and Maple-trees unequaled in majesty and grace by those of any part of the world. In the rich alluvial soil which forms the low banks of such streams, the Silver Maple rises sometimes to the height of a hundred and twenty feet, with a trunk three or four feet in diameter. Ten or fifteen feet from the ground this divides usually into three or four stout, upright, secondary stems, which are destitute of branches for a considerable height above the division of the main trunk and then ultimately separate into many slender branches with slender, pendulous branchlets, the whole forming a wide and majestic head. The bark of the trunk on the old trees is bright reddish brown, more or less furrowed by deep, longitudinal fissures, while the surface separates easily into large, thin scales. On trunks of young trees and on the branches of old ones the bark is quite smooth and light gray, faintly tinged with red. The young branchlets are bright chestnut-brown, with a smooth and lustrous surface, and are marked with large, pale spots. The winter-buds are rather small and are covered with bright red, imbricated scales, with a conspicuous fringe of pale hairs on the margins. The ample leaves are often six or seven inches in length, rather less in width, and are deeply five-lobed by narrow sinuses, with acute, irregularly toothed divisions, the middle division being often larger than the others and somewhat lobed. They are thin and membranaceous, and borne on long, slender, bright red petioles they dance with the slightest breath of wind, displaying in turn the bright and cheerful green of their upper surface and the silvery whiteness which clothes their lower surface. In autumn they turn pale yellow.

The flowers of the Silver Maple, like those of our Red Maple, appear late in the winter, or in very early spring, long before the leaves; they are produced in sessile axillary fascicles on the shoots of the previous year, or on short spur-like branchlets developed the year before from the wood of the preceding season. The sterile and fertile flowers appear in separate clusters, sometimes together on the same tree, but more frequently on different trees. The buds from which they open are aggregated into compact clusters, and are covered with thick red and green scales fringed on the margin with long rusty brown hairs. The flowers are greenish yellow and have no petals; the calyx, which is five-lobed, is slightly hairy on the outer surface and is long and narrow in the sterile, and short and broad in the fertile flower. There are from three to seven stamens; in the sterile flowers the slender filaments lengthen until they become two or three times as long as the calyx when the pollen is discharged from the anthers, while in the fertile flowers the filaments do not lengthen after the bud opens, and the anthers wither or fall off without opening. The ovary, which is reduced to a minute point in the staminate flower, is covered with hairs. It is possible that perfect flowers with a fully developed ovary and stamens may be found, as such is the usual order of nature in the case of flowers which have become generally unisexual by the abortion of one of their organs, but if such flowers exist, they are uncommon. The ovary of the fertile flower develops into a large fruit with long broad wings, which are sometimes nearly straight and sometimes shaped like a scythe. The fruit ripens at the end of a few weeks after the flowering period, if it is not destroyed by spring frosts, as is often the case, for the Silver Maple, enticed into opening its flower-buds by the succession of a few warm days in late winter, pays for its temerity with the loss of its fruit. Sometimes only one of the two samara, of which the fruit of the Maple is made up, is developed, and it is not an uncommon thing to find a tree producing one-sided fruit, the second and undeveloped ovary appearing as a rudiment at its base. The seed of the Silver Maple, if it happens to fall on moist open ground, germinates immediately, and produces plants which grow sometimes to be nearly a foot high before winter and strong enough to have in their favor the chances of surviving the hardships to which all seedling plants are subjected. In this habit of early flowering and quick development of the seed of

our Silver and Scarlet Maples, a habit which is peculiar to them, may be found, perhaps, a wise provision for their perpetuation. These two trees grow on low river-banks or in swamps—situations which are often submerged for a considerable part of every year, especially in winter and early spring. If the seeds of these trees ripened in the autumn, like the seeds of other Maples, and did not germinate until the following spring, they would run a serious risk of being water-soaked and of losing their vitality. Now, however, they reach the ground at the very best period of the whole year for quick germination. The water has receded from about the trees, leaving a moist open surface, warm, but not yet baked by the sun of early summer. It is a question which we do not pretend to answer, whether these trees acquired this habit of ripening their seeds early in the summer in order to maintain their existence in the low situations where they grow, or whether, the habit having been previously acquired, they were gradually driven to the swamps because their seeds were unable to germinate on the drier uplands at the period of the year when it reached the ground and could only germinate in soil from which the water had recently receded, and was, therefore, full of moisture.

The Silver Maple is widely distributed in eastern America; it is found in the north from the valley of the St. John's River, in New Brunswick, to southern Ontario, and extends southward to western Florida and westward to eastern Dakota, Nebraska, Kansas and the Indian Territory. It is not found very near the Atlantic coast or in the high Appalachian Mountains. It is very common, however, west of the mountains throughout the Mississippi-valley, where it is one of the largest and most generally distributed of the river-trees.

The Silver Maple is often called also the Soft Maple, a name which it owes, probably, to the brittleness of its slender branches, for the wood of this tree is not soft, but hard, strong, close-grained and valuable, furnishing excellent material for the floors of houses and for furniture. It was the Swedish traveler Kalm who first distinguished the Silver Maple, and sent it to his master, Linnæus, who named it *Acer saccharinum*, a name which has unfortunately become more associated with another of our Maples than with the tree to which it properly belongs.

The Silver Maple has been cultivated in Europe since 1725, and flourishes there not so well, perhaps, as on the banks of its native streams, but better than many of our American trees; and in American and European nurseries a number of varieties with more or less cut or divided leaves, or with leaves blotched with yellow or with white, or with more or less pendulous branches, have appeared. None of these varieties, however, are very distinct or in any way materially better or more beautiful than the wild tree.

The Silver Maple is a valuable tree in ornamental planting only when it can be placed in deep, rich and moist meadow-land or by the banks of streams or lakes over which it can spread its long and graceful branches and display the beauty of its brilliant foliage. Its beauty as a meadow-tree is shown in the illustration on page 140, which represents a young planted tree, fifty or sixty feet in height, growing near Boston.

The Value of Good Roads.

IN the issue of this journal for December 17th and 24th, 1890, we gave some extracts from the report which Mr. J. B. Harrison, one of the Forestry Commissioners of New Hampshire, was about to present to the Legislature. These extracts set forth the value and functions of mountain-forests in relation to climate, soil and water-supply, as well as their use in furnishing beautiful scenery as an attraction for summer tourists. The broad prospects among the New Hampshire hills, as well as the pure air and clear flowing streams, with the game and fish in woods and waters, are just as truly natural wealth and sources of revenue as are fertile soil and abundant water-power. They invite summer travel, as similar attractions draw thousands of tourists every year to Norway and Switzerland. These resources, neglected as they are, brought visitors into New Hampshire in the year 1889 who left five millions of dollars in the state. If a genuine effort were put forth to heighten these attractions and make them available, there can be no doubt that these summer visitors could be increased manyfold. For the full utilization of these advantages good roads are essential, and on this point the Commissioners make some recommendations which we quote from the published report:

If we had in our mountain regions as good roads and paths as have been constructed in European countries, whereby more of our mountain scenery could be brought to view, and more of our mountain passes, ravines, gorges and lakes be rendered accessible to the tourist, which are now known only to sportsmen, searchers for timber, and the bold climbers of the Appalachian Club, the large revenue from summer tourists might be doubled, quadrupled, or increased indefinitely. This great interest urgently calls for better roads and paths than it now has, and for more of them, so that in time every mountain pass shall be accessible by a good highway, and every important lake and summit, and other place of special interest, can at least be reached by an easy foot-path or bridle-path.

This opinion has a basis other than that of mere sentiment. It rests upon the more solid ground of profitable utility. If properly constructed and cared for, such roads and paths would prove as remunerative as our average highways. When completed they would afford, in connection with those now in use, circuitous drives of great attractiveness, opening new areas to the lumberman, and new sites for mountain houses, and influencing summer visitors to prolong their sojourn in the state.

If such highways were carefully projected and gradually constructed, at the rate of a few miles each year, their cost would not be burdensome, and they would eventually make known to the world the scenic treasures of our mountain region, many of which are still unknown and inaccessible to tourists. In these attractions New Hampshire has natural resources possessing a cash value as real as that of her waterfalls or her soil; resources which she can and should develop for the benefit of the thousands of summer visitors who annually come within her borders, and for the pecuniary advantage of her own people. The last Legislature made seventeen different grants of money to aid in the construction and maintenance of public bridges and highways, mostly in the mountain regions, amounting to $20,700. It is important that there should be system and foresight in the expenditure of such appropriations. The Swiss and Norwegian roads, so inviting to tourists, have been planned with much care and built with great thoroughness. Their surfaces are hard, their grades are easy, and they are, in all respects, pleasant and safe for travelers. Thus made, they are more expensive at first, but in the end they are more economical, as well as much more satisfactory in use, than the mountain roads to which we are accustomed in New Hampshire.

Memorial Trees.

ELEVEN years ago a man who had watched with great interest the development of Cornell University from its very beginning intimated his desire to present to it some memorial to express his interest and love for the institution. He had not the wealth, by means of which others had enriched it with costly buildings, but he appreciated the beauty of trees, and he conceived the idea of manifesting his love for the University by planting a row of Elms along the eastern avenue of the campus. He was enabled to carry out his generous purpose, and the trees are already attaining noble proportions. The giver has passed away, but the gift promises to remain for many a year, a living witness to his generous spirit. At either end of the long line is a firmly bedded stone, upon which is chiseled the simple inscription, "Ostrander Elms. 1880."

May not this example stimulate other public-spirited citizens to adorn their town-squares or village-streets with beautiful and unobtrusive memorials of this character? In what more delicate and permanent form can a man of moderate means express his appreciation of the beautiful in nature, and his desire to bless those who are to come after him?

Recent Botanical Discoveries in China and Eastern Burma.—V.

Rehmannia.—An examination of the copious specimens of this ornamental genus, collected by Dr. Henry, led to an increase in the number of species, including two described for the first time, and the raising of *R. glutinosa*, var. *angulata*, of Oliver, in Hooker's "Icones Plantarum" (t. 1589), to specific rank. At the same time the forms are so numerous that *R. glutinosa*, *R. angulata*, and what I take, from the description, to be *R. Piasezkii* of Maximowicz, are not quite satisfactorily definable from dried specimens; and I am doubtful whether I have correctly referred *R. Chinensis*, as figured in the *Botanical Magazine* (t. 3653) and in the *Botanical Register* (t. 1960), to *R. glutinosa*. A comparison of the two figures cited reveals considerable difference in the coloring, which is of a kind that recalls the American genus Salpiglossis, of which it is no very distant relation. The plants figured differ from the wild dried specimens from north China in having more decidedly leafy flowering-stems—a result, probably, of cultivation. Both *R. angulata* and *R. Piasezkii* are usually taller-growing plants than *R. glutinosa*. Among the specimens referred to *R. Piasezkii* are some between two and three feet high, and, judging from their vigor, this species probably reaches as much as four feet in height under favorable conditions. On the other hand, it is sometimes reduced to a single flower; yet that flower is larger, with a wider corolla, than in any of the specimens of *R. glutinosa*. Some of the specimens are described as having white flowers, but one from the Ningpo District is said to have magenta flowers and to be an exceedingly showy plant. In shape and size—three inches long—the flowers remind one forcibly of those of *Lophospermum scandens*. *R. angulata* differs in the lobes and teeth of the leaves being pointed instead of rounded. The flowers are variously colored—red, scarlet and orange being combined in the same flowers. A very pretty plant of this affinity, which I have doubtingly referred to Rehmannia, and called Oldhami, after its first discoverer, comes from Formosa, where Mr. W. Hancock collected good flowering specimens in 1885. He found it growing on dripping rocks under the shade of coarse vegetation. It has light-colored flowers (judging from dried specimens only) with dark blotches on the lobes, and in size and shape they are much like those of a medium-sized Pentstemon. Finally, there is a remarkable new species which I have described under the name of *R. rupestris*, in allusion to its natural place of growth on the face of cliffs or rocks. It has been raised at Kew from seeds sent home by Dr. Henry, and it has been drawn for the *Botanical Magazine*, so its characteristics will soon be familiar to persons who see that periodical. *R. rupestris* differs conspicuously from the other species in the thick leaves being clothed with a thick, white, woolly felt, which was strongly developed in the cultivated plant. In a pot it assumes a curious habit, putting forth thick fleshy branches which take a downward direction, concealing the pot. The yellow flowers of the cultivated plant were not so showy as those of the other species; but one of the specimens is said to have had pink flowers. The Chinese name signifies "cliff-cabbage," given to it probably on account of the large rosette formed by its broad radical leaves. From the foregoing notes it is manifest that the genus Rehmannia merits the attention of the gardener.

Calorhabdos.—A somewhat lengthy name, signifying beautiful rod, given first to a single Himalayan species; and now five Chinese species are known, from dried specimens at least. I am not aware that any species of Calorhabdos has ever been cultivated, but should they prove hardy, they are promising plants for introduction in shrubberies and half-shaded situations. Botanically, they are closely related to the Veronicas; in habit, they are mostly like the trailing *Vinca minor;* and four out of five of the Chinese species have the small white, pink, red or purple flowers crowded in short, catkin-like spikes, borne in the axils of the usually thick, cordate or lanceolate, toothed, alternate leaves. A figure of *C. latifolia* is given in the "Index Flora Sinensis" (*Journal of the Linnean Society*, xxvi., t. 4), which will afford a better idea of the type of plant than a long description. One of the Chinese species, *C. axillaris*, also inhabits Japan, and should be easily procured.

Paulownia.—The last member of the *Scrophulariacæ* I have to mention is the arboreous *Paulownia Fortunei*. This is not absolutely new to science, having been described by Seemann as long ago as 1867, from imperfect specimens collected by Robert Fortune, to whom we are indebted for so many beautiful plants from the far east. Seemann had only a portion of an inflorescence, bearing three or four flowers, and may therefore be excused for having referred it to the *Bignoniaceæ*, under the name of *Campsis Fortunei*. There are two such specimens in the Kew Herbarium; one bore Seemann's name, and the other was labeled *Paulownia imperialis*. With ample specimens from the two distant provinces of Kwangtung and Shantung, collected by the Rev. B. C. Henry, an American Missionary, and others, it was at once manifest that we had to do with a second species, differing from *P. imperialis* by its much elongated, cordate, almost caudate leaves, glabrous and smooth on the upper surface, and clothed with a very short, dense, white felt on the under surface; and in the longer, more curved flowers. It is described as a tree twenty feet high, and would, probably, flourish better in North America than in England, where there is usually not sufficient sunshine to ripen the wood.

Kew. *W. Botting Hemsley.*

The Arborescent Yuccas of California.

THE genus Yucca is represented in California by three species, neither of them, however, peculiar to the state. Indeed, they are the most northerly outliers of the genus, which has its greatest development in northern Mexico.

Two of the three attain to the size of trees, *Y. brevifolia* being the largest. It is wholly confined in California to the Mojave desert, of whose peculiar and interesting flora it is the most conspicuous member. On the north its limit is defined by the Tehatchipi Mountains, while the San Bernardino range confines it on the west. South and east its range extends beyond the boundary of the state to the valley of the Virgen, in south-western Utah, and to the Colorado plateau of Arizona. All this great district is a parched desert, and here at elevations of from 3,000 to 5,000 feet above the sea, on gravelly slopes and mesas, *Yucca brevifolia* finds a congenial home. Intermixed with a scrubby Juniper (*J. occidentalis*), it covers many hundred square miles with straggling forests, whose gaunt aspect makes even more cheerless the arid and desolate region they occupy.

The trees reach the height of twenty, and even thirty feet, with a trunk diameter of over a foot. The upper third of the trunk is furnished with a number of contorted branches, which form an irregular and often grotesque head. The leaves are about eight inches long and half an inch wide, rough and very rigid, the edges serrulate, and the extremity armed with a spine. Only those at the ends of the branches show by their ashy green color that the tree is living; the older ones are closely reflexed to the branches and bleached by the sun. The lower portion of the trunk is bare and brown.

Although this tree was noticed by Frémont in 1844 it was thirty years later before its flowers were made known. These were first observed by Dr. Parry in 1874 in southern Utah, and described by him in the *American Naturalist* for March of the succeeding year.

They are produced near the ends of the branches in short and rather dense, sessile panicles. The perianth has none of the grace and elegance characteristic of the genus. The texture is thick and leathery, the color dirty white, and the narrow segments are confusedly crowded. A disagreeable odor adds to the unattractiveness of the flower. April or May is the time of flowering, according as the season is early or late.

The fruit is dry, with a somewhat spongiose pericarp, the withered remains of the perianth persisting at the base. Good specimens are four inches long and nearly two in diameter. Although truly indehiscent, the ripe fruit manifests a tendency to the capsular structure by the replacement at what would be the dissepiments of the thick texture of the pericarp by a thin membrane, which occasionally splits. They are opened here by birds, which are perhaps in search, not so much of the seed as of the larvæ which abundantly infest them.

The seed has the black color and the flat, orbicular shape common in the genus. They are about a quarter of an inch in diameter and a line thick. The tree apparently produces its flowers every year, but is very irregular in perfecting its fruit, which is abundant in some seasons, but in others is an entire failure throughout large districts. In 1876 I traveled many miles through the Yucca-forests of the Mojave, finding but a single group of less than a dozen trees which had produced fruit that year.

The wood is coarsely fibrous, and is without any present economic value. It was at one time thought to be available as a material for paper fibre, and a factory was built in the desert, where it was prepared for shipment to England to be used for that purpose. The enterprise was apparently unsuccessful, and was soon abandoned.

In Utah this tree is called the Joss, Josh or Joshua, a name probably given it by the Mormons, and the meaning and

derivation of which are alike unknown. It is more properly known in California as the Tree Yucca. It has nothing to recommend it for cultivation, and does not succeed even in the San Bernardino Valley, only a score of miles from its native home.

Yucca baccata, the second arborescent species of the state, shares with several others the popular name of Spanish Bayonette. The territory it occupies includes the region to which *Yucca briarfolia* is confined, and extends beyond it both east and west. In the former direction it reaches well into Texas, while in the latter it extends over most of the four southern counties of California. With this wider territorial range it also flourishes under a greater diversity of altitude and climate, but is, withal, strictly confined to the zone of aridity. It is reported to form extensive open forests in some parts of Texas; but this is not the case in California, where it is solitary, or, at most, in small groups. It reaches its best development in the deserts, both as respects size and numbers. The trunks are either single, or two or more form a common base, and are from five to fifteen feet high and a little over six inches in diameter. The branches are few and short, and, like the trunks, clothed with the dead and reflexed leaves. Only those at the extremities are living, as is the case with most tree Yuccas. The leaves are two or three feet long and nearly two inches in width, and have on their edges a few coarse loose fibres. Sometimes the plant is acaulescent, but, perhaps, never truly so in mature specimens.

The flowers are produced in the month of March, or even earlier, near the ends of the branches, in a nearly sessile, broad panicle. They are large, campanulate in shape, of a white color, often shaded with purple, and of a peculiarly wax-like texture. They are very beautiful, either when seen in moss or more closely examined as individuals. Thus examined, they are found to derive an added elegance from the thick, snow-white filaments and ovary, the former tipped with bright yellow anthers, and the latter with the green stigmatic appendages.

This Yucca seldom ripens its fruit in this region. It is baccate in structure, cylindrical, and four or five inches long when mature. It is said to be sweet and edible. The Indians obtain a coarse fibre by macerating the leaves, which they use to manufacture mats and cordage. In time it may come to be utilized by civilized man for similar purposes. Although producing a beautiful flower and growing readily in cultivation, it has little value for that purpose, because of the extreme slowness of its growth—many years, probably, being necessary for a plant to attain a blooming size. *S. B. Parish.*

Plant Notes.

The Fruit of Akebia quinata.

THE handsome and hardy Japanese climbing plant, *Akebia quinata*, has become common in our gardens, where it is admired for its abundant dark green, digitate leaves, which are peculiarly noticeable in the late autumn and in the early winter, as they remain on the stems with little change of color until long after nearly all other deciduous plants have lost their foliage; and for the abundant and curiously formed rosy purple flowers. But very few people in this country or in Europe have ever seen the fruit of the Akebia or realize what a beautiful object it is. The illustration on page 137, made from a specimen which was produced last year in the Arnold Arboretum, will give an idea of the shape and size of the fruit, but will not, unfortunately, convey any idea of the beauty of its color.

The flowers of Akebia are unisexual, but are produced together in the same pendulous raceme. The females, which vary in number from one to three on each raceme, are borne on long, slender pedicels from its base, and are two or three times as large as the males, which are more numerous and are collected together on very short pedicels at the apex of the raceme. The long stems of the female flowers cause them to hang with or below the males an arrangement which seems admirably suited to insure their fertilization by pollen carried from the adjoining male flowers, either by the wind or by insects. But, for some reason or other, fruit is very rarely produced and only on certain individual plants which continue fruitful year after year, while other plants growing with them under exactly similar conditions remain barren. In 1864 *Akebia quinata* produced fruit with the aid of artificial fertilization in the arboretum at Segrez, in France, for the first time it was claimed in Europe, and a figure of it was afterward published by Monsieur Lavallée in his *Arboretum Segrezianum* (t. 28).

The first record of this plant having fruited in this country appeared in the *Gardeners' Monthly* in 1876 (xviii., 324), where it is stated that one of the two plants placed a few years previously by Mr. William M. Canby, of Wilmington, Delaware, in front of his house had produced fruit. Two years afterward fruit appeared on a plant in the garden of Captain H. D. Landis, at Chestnut Hill, near Philadelphia (*Gardeners' Monthly*, xx., 326); and plants are known on Long Island which have fruited every year for a number of years, and the fruit has been exhibited at the county fairs on the island, as I have been informed by Mr. William Falconer, of Glen Cove, who sent the fruiting plant to the arboretum. It is part of a plant in Mr. Charles A. Dana's garden, and was obtained by division. It is interesting that the fruitfulness of this individual appeared the year it was planted in the arboretum. Mr. Canby writes: "There are two Akebia-vines growing over the porch in front of my house; they have been there for nearly twenty years, and have had more or less fruit on them every year from the time they were well grown until this last year, when the flowers were destroyed by the late frosts. Very frequently there is no fruit, but usually each vine has from half a dozen to twenty each year. The baccæ which develop are most frequently one, often two, less commonly three or four, and rarely five. In the latter case, when they become ripe and open, the whole object has a striking appearance.

The fruit of Akebia is technically a berry or a collection of berries, slightly joined at the base, each developed from a free ovary. The individual berry is oblong, four to six inches long, cylindrical, and not unlike the fruit of the Papaw in shape. It is dark purple, mottled with a beautiful shade of blue, and covered with a glaucous bloom. The flesh is thin and dry, and splits open when fully ripe on its inner face, disclosing a fleshy placental mass of semi-transparent whitish pulp, in which the showy black oval seeds are imbedded in great numbers. This is attached at the back by a line following the dorsal suture, and in drying rolls up. The cylindrical, pulpy mass is the edible part of the fruit, and is eaten in Japan; it is insipid, however, and not very palatable, and Akebia-fruit will probably never be valued in this country except as an ornament. It is, however, so very showy that nurserymen should take advantage of the fruit-producing tendency of certain individuals and propagate from them rather than from those which are not fruitful. *C. S. S.*

Some Recent Portraits.

FIGURES of the cone and foliage (t. 7162, 7163) of *Encephalartos Altensteinii* open the March issue of the *Botanical Magazine*. This is a noble south African species said to become sometimes arborescent. The orange-brown cone produced in the garden of Mr. W. H. Tillett, of Norwich, described as eighteen inches long and thirty inches in circumference, is extremely ornamental, as is the habit of the plant with its graceful pinnate leaves.

Two species of Masdevallia are figured in this issue, *M. macrura* (t. 7164) and *M. punctata* (t. 7165). The former is a discovery of Roezel's in New Granada, and was described many years ago; the flowers are purple on the exterior, orange or yellow within, and remarkable for the presence of prominent nerves covered with numerous dark purple warts in the interior of the perianth. The narrow yellow tails of the sepals vary from four to six inches in length. *Masdevallia punctata* is a small plant with small orange-brown flowers, and is most nearly allied to *M. swertiæfolia*, belonging to a small group of the genus in which the lip is superior. The native country of this plant is unknown, although it is supposed to be from the mountainous regions of New Granada. The remaining plate is devoted to *Clematis Stanleyii*, already figured in our columns.

A fruiting branch, with figures of the scales and a section of the leaf of the beautiful *Abies religiosa*, accompanied by a

portrait of a small tree growing in England, appears in the issue of the *Gardeners' Chronicle* for March 7th. This is the Mexican Fir-tree, through the forests of which travelers visiting the city of Mexico by rail now pass near the summits of the mountain ranges which are crossed before the valley of Mexico is reached. It is a very beautiful tree, but, unfortunately, is not hardy in the northern and eastern states. It might be expected, however, to flourish in California, and it would be interesting to know if any large specimens already exist there. The specific name given to this tree was selected because the Mexicans are fond of decorating their churches with its branches.

The colored frontispiece of the March number of the *American Garden* is devoted to a cluster of fruit of *Akebia lobata*, and serves to illustrate the third number of Professor Georgeson's instructive papers on the economic plants of Japan. *Akebia quinata* is well known in gardens, but this second species, for some unexplained reason, appears never to have been introduced into those of America or of Europe. Its home, Professor Georgeson tells us, is in the

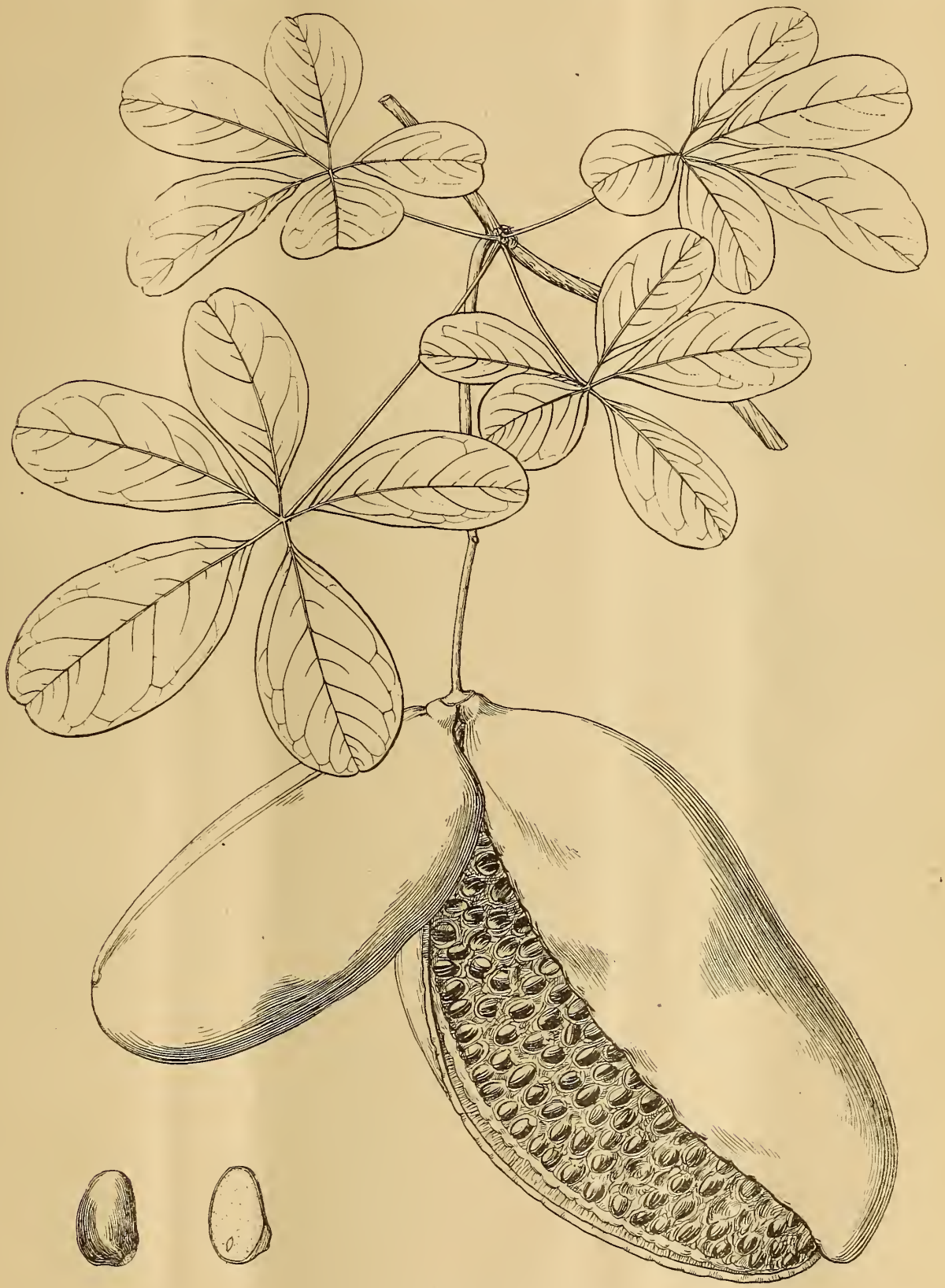

Fig. 25.—A Fruit of Akebia quinata.—See page 136.

mountains of northern Japan. It might, therefore, be expected to prove hardy anywhere in the United States. "It is," he says, "a more rapid and vigorous grower than the former species. I found some very fine vines of this kind in the lower mountains in the northern part of Iwati prefecture, which is well up toward the northern point of the main island. One vine especially attracted attention by its size and load of fruit. It grew in a spot of rich soil, mostly leaf-mold, by the side of a spring in the edge of a wood where it rambled over a thick growth of tall bushes and small trees, within an area of a square rod." As this plant was known to Siebold who, with Zuccarini, published a figure of it in the Flora of Japan, it is certainly curious that the horticultural collectors who have ransacked Japan so thoroughly of late years have failed to send home any seeds of a plant which, if we are to judge of its value by that of its relative, is likely to be of first rate importance in our gardens, especially if it proves more fruitful than the better known *A. quinata*.

Foreign Correspondence.

London Letter.

Lindenia.—It is now six years since this monthly publication was started by the Messrs. Linden, of Brussels. It is devoted exclusively to Orchids, of which 272 pictures, mostly well executed, have already appeared. An English edition has been started this year, of which part II. has lately been published. With such powerful and established competitors as Warner and Williams' *Orchid Album* and *Reichenbachia*, besides *The Garden* and the *Botanical Magazine*, Messrs. Lindens' venture will have to be smart to succeed in England. Certainly nothing could be better than these first two parts, both with regard to the excellence of the drawing and colors of the plates and the interest of the letterpress. Orchidists are to be congratulated upon the number and quality of the periodicals now devoted to illustrating and describing all the best garden Orchids. The plants figured in the parts of the English *Lindenia* already published are as follows: *Cattleya Rex*, which is supposed to be a white-petaled *C. Dowiana*, and which is a most beautiful plant, is represented in the plate; *Cochlioda Noezliana*, a delightful Orchid, similar in habit and flowers to *C. vulcanica* (better known as *Odontoglossum vulcanicum*), differing in having bright scarlet flowers, with a purple-tipped column. I may note here that at the auction sale to-day the plants of this Orchid offered by Messrs. Shuttleworth & Co., although small and newly imported, realized as much as ten guineas each; *Peresteria aspera*, shown as having the pseudo-bulbs of *P. elata*, and a short, drooping raceme of fleshy, cupped flowers, not unlike those of *Acineta densa* in size and shape, but colored tawny yellow, with numerous reddish spots. *Cattleya Warocqueana*, var. *amethystina*, the flowers of which are as large as those of the largest *C. gigas*, and colored deep purplish rose, with a large amethyst-colored lip, deep yellow in the throat; *Catasetum saccatum* is beautifully figured, and is described as "a splendid species, one of the largest of the genus. The sepals are over two and a quarter inches long, marbled and almost suffused with purple brown on a light-green ground. The petals are a little shorter and similar in color. . . . The lip is a remarkable organ, three-lobed, strongly fimbriate, green suffused with brown, white round the mouth of the saccate spur." *Cattleya granulosa*, var. *Buyssoniana*, remarkable for its uniformly cream-yellow sepals and petals and its white and crimson labellum. *Odontoglossum Clœsianum*, a large-flowered form of *O. crispum*, with numerous large, red-brown blotches. It is described as a probable natural hybrid between *O. crispum luteopurpureum*, but on what ground is not clear. The eighth plate represents a pretty mass of the elegant little *Phalœnopsis Lowii*. Except the Phalœnopsis, all these plants are the introductions of the Linden Company.

Horticultural Appliances.—At the Crystal Palace, Sydenham, an exhibition of considerable interest to gardeners was opened on the 3d, and will continue till the 31st of March. It is devoted to greenhouses, heating apparatus, various tools—in fact, to all kinds of garden furniture and machinery. On the whole the exhibits do not comprise anything of exceptional novelty for the professional gardener or well-informed amateur. Nevertheless, it cannot but prove useful to the thousands who daily visit this popular resort, and who are more or less interested in garden work, but are ignorant of the latest improvements in the way of tools and garden appliances generally. For this reason exhibitions of this kind are desirable wherever horticulture is general.

Lilium Harrisii.—The Bermuda Lily has become of enormous importance to flower-growers in England. The market-gardeners in the London districts alone import millions of it yearly. In one nursery some hundreds of thousands are planted every year, and are treated so as to come on in batches, so that the flowers are available from March to October. In Mr. Iceton's nursery at Putney I saw lately house after house filled with this Lily, while in frames and beds were many thousands more in various stages of growth. The bulbs had been planted singly in five-inch pots in strong loam. The stem on each bulb of the many thousands which will open their flowers in about a fortnight, so as to be ready by Easter, was as thick as a man's thumb, from four to five feet high, leafy down to the base, and crowned with a cluster of plump buds. I counted the buds upon many of the stems, and found the average to be six flowers per bulb. With the market-growers it does not pay to attempt to use the bulbs of this Lily a second year; they are therefore sold for a mere song or destroyed after having flowered. The three Lilies generally grown by the London market nurserymen are *L. candidum*, *L. eximium* and *L. Harrisii*. Grown as Mr. Iceton grows them—at first plunged in fibre or ashes outside, then removed to unheated frames, and from thence to warm, moist, light houses, where they stand pot thick, their roots saturated, their heads almost touching the glass—they are an immense success.

Kentias.—The most popular decorative Palms in England are the several species from Lord Howe Island, which were originally described as Kentias by Mueller, and subsequently altered to Howea by Beccari. In gardens, however, they are still generally known as *Kentia Forsteriana* and *K. Belmoreana*. Besides these names there are *K. Mooreana*, *K. rupicola*, and *K. australis*, but the plants in gardens which bear them appear to be merely varieties of one or the other of the two first named. These are grown in hundreds of thousands by London nurserymen, and are sold in all sizes, from plants a foot high in three-inch pots, to big specimens fifteen feet high. They are superior to most other Palms, from the fact that their leaves are not easily injured, and they remain on the plants for many years, so that a specimen fifteen feet high often still retains the leaves which it had when small. They are not injured by being huddled closely together, so long as they get plenty of moisture and warmth. This gives them great value as plants for temporary decoration, and their seeds are now imported by the hundredweight, many of them being disposed of at the auction rooms.

There exists some confusion among growers with respect to these two fine Palms, many being of opinion that they are merely varieties of one species. The following extract from a report on Lord Howe Island by Mr. J. Duff, of the Sydney Botanic Gardens, may throw some light upon the matter. He says:

"Baron Mueller, in the fifth volume of his 'Fragmenta,' describes four distinct species of Palms indigenous to Howe Island, while Mr. Bentham, in the 'Flora Australiensis,' only enumerates three species, stating that he finds 'no difference in the male flowers and fruit of *K. Forsteriana* (the Thatch Palm) and *K. Belmoreana* (the Curly Palm), and that their distinctness remains to be ascertained.' Both Palms flower exactly alike, *i. e.*, they produce their flower-spikes generally from the axils of the lowest row of leaves, but occasionally young, undeveloped flower-spikes spring from the axils of the leaves above them. The seeds [fruits] of the Curly Palm are oval and a greenish yellow color when ripe, while those of the Thatch Palm taper to a point at both ends and are dark crimson when mature.

"The chief specific distinctions, however, are: The Curly Palm bears its flower-spikes singly, which average five to six feet in length, while those of the Thatch Palm consist of five spikes in a row, united together at the base, of an average length of three to four feet.

"The fronds and pinnæ of the Curly Palm are recurved at the apex and the pinnæ are nearly erect at the base, the Thatch Palm having less recurved, darker green fronds and broader, pendulous pinnæ, which distinctions are observable even in the small seedling plants.

"The Curly Palm is the most abundant and wide-spread species, as it extends from the beach to an elevation of about 1,200 feet, while the Thatch Palm is confined chiefly to the beach.

"At an elevation of about 1,000 feet the large Mountain or Umbrella Palm (*Kentia Canterburyana*) is met with growing in patches from this height to the summit of the mountains, to which the small Mountain Palm (*K. Moorei*) is also confined."

It is remarkable that these Palms, which are wild only in this small island, should prove under cultivation so indifferent to treatment as to grow under all sorts of conditions, if only they can obtain heat and moisture.

London. *W. Watson.*

Cultural Department.

Rose Notes.

THE season about to close has not been satisfactory to most of those who grow Roses for cut flowers; there have been many failures, and in many instances the failures are unaccountable. Careful growers, as well as careless ones, have been tried to a greater or less extent by the failure of some variety or varieties to come up to the high standard of excellence now generally established. Of course some of these losses may be directly traced, as usual, to either overfeeding or overforcing. An instance of the latter I observed a few weeks since, when a house of Brides, that in the early part of the season had been very promising, was apparently struck all at once by disease in the form of the "yellows," and at the time of my visit most of the foliage had turned nearly the color of the Golden-bedder Coleus, and, of course, the house was completely ruined either for flowers or for stock. In this case it was plain that the house had been kept too warm in order to hasten the flowers for the holiday trade, and it therefore seemed reasonable to infer that this caused the sudden breakdown of the plants some six weeks later.

The growers of early hybrids, too, seem to have had their full share of misfortunes, for many of the early crops were not nearly up to the standard. Mrs. John Laing and Ulrich Brunner continue to retain their popularity, some very fine blooms of the latter having been in market for weeks past. The early Mrs. Laings were not remarkable, many of them being more or less malformed, but really good flowers of this variety were always in demand.

Captain Christy is a hybrid Tea that should be more widely grown, for when in good condition its good size and its exquisitely tinted flowers of delicate flesh color are highly attractive. Unfortunately, Captain Christy is a somewhat shy bloomer when forced, but still a few such flowers as we sometimes see, cut with stems eighteen inches to two feet in length, will well repay for the space and trouble they require.

Another old Rose that deserves attention is Maurice Bernardin, a seedling from General Jacqueminot, and sent out some thirty years ago. It is bright crimson, of good size, and also a free grower and bloomer. Maurice Bernardin forces very well, too, but has the disadvantage of blooming in clusters frequently, and it therefore becomes necessary to disbud in order to secure good flowers when forced. As an out-door Rose this variety is a very satisfactory one, the color being very fine.

Eugénie Verdier is also a good out-door Rose, its silvery pink flowers being of good shape and size, and the shade of color is a very pleasing one.

Since the novelty has worn off Duchess of Albany does not seem quite as popular, and, though a lovely Rose when in perfect condition, yet this variety certainly has not displaced La France, and in many instances the experience of the florists during the present season has been that they could sell two La France roses for every Duchess of Albany they disposed of.

Good flowers of Madame Hoste have been in demand, and, generally speaking, this has proved a useful Rose; and it is a prolific one, too, though the flowers are to a great extent produced in crops, and the foliage seems quite susceptible to mildew.

The old stand-by, Bon Silene, has also been much used in some cities this season, and while it cannot compare in the matter of size with some of the newer introductions, still the color is attractive, and when well grown it makes a charming corsage bouquet.

The most noted new Rose of American origin, Waban, is finding a ready sale among the trade, the stock prepared for the first delivery (April 15th) being now exhausted, and orders are being booked by the agents for a second delivery, which is promised to take place May 15th. This Rose has already been described in the columns of Garden and Forest, but it may be well to repeat that it is a sport from Catherine Mermet, much deeper in color than its parent, and in growth and habit very similar to that well-known variety. It originated in a florist's establishment in Massachusetts, and is being simultaneously distributed by several wholesale agents in various parts of the country.

Young Roses for future planting should now be growing freely, and should not be allowed to become starved for want of repotting. A stunted condition is often invited by a little neglect in this essential, and once in such a condition it is hard to get the plants out of it. Thorough syringing will also be required every bright day, for the sun is now strong and evaporates much moisture in the day. Pot-grown hybrids will take an abundance of water, and applications of liquid manure from time to time will increase the size of the flowers and general vigor of the plants.

Plants of this class are now much used in decorations, Anna de Diesbach and Magna Charta being two favorites for this purpose, while the well-known hybrid China, Madame Plantier, is also used with charming effect, its pure white flowers being produced in great abundance. The latter variety, however, needs to be brought on slowly in order to secure the best result, for when forced hard the flowers have very little substance.

The pruning of out-door Roses should not now be postponed, as it should be done before the sap rises.

Holmesburg, Pa. *W. H. Taplin.*

Hardy Narcissus.

IN English gardening periodicals the complaint is now current that bulbs of Narcissus, planted in the open ground late last fall, have been kept perfectly dormant all the winter owing to the unusual severity of the season, and fears are expressed for the crop of bloom and welfare of the bulbs, owing to insufficient root action. Although this is a complaint of English growers alone, still we may gather some useful hints from it which may help us when planting time comes again. It is perfectly safe to say, that as soon as the value of a permanent bed of out-door Narcissus is generally recognized these charming spring bulbs will be planted in large quantities. But failure, or partial failure, is almost sure to confront the cultivator in the first attempt unless certain precautions are taken at planting time, and of one of these precautions the complaint referred to forcibly reminds us. Nine-tenths, perhaps, of the Narcissus planted each year are newly imported bulbs, for which we have to depend upon dealers who get them with their other bulbs in fall, and by the time these get to the planters the season is far advanced and sharp frosts are upon us, rapidly robbing the soil of its store of warmth laid up during the summer. Such was my own experience last fall when planting an extensive permanent bed of Narcissus in the open ground. Fortunately the difficulty was foreseen, and, after planting, a covering of twenty-four inches of dry leaves was placed over the whole bed, and it was scarcely completed before snow was upon us, and hard frosts. It was a long time before the thick blanket of leaves was wet through, and consequently the soil did not freeze, and an examination to-day proves that the growth made by the bulbs is ample at the root to support the leaves and flowers when the time comes for them to appear. There is no doubt that the covering of leaves served as a protection from cold above and prevented the escape of warmth from the soil. As soon as the weather permits the covering will be carefully removed and the bulbs will be in flower a very short time after, as they are now pushing through the soil.

There is one other way to ensure success with a new planting, and this is by obtaining American-grown bulbs. In this way the beds may be planted as early as the middle of July, and better at that time than later, for, owing to the strong sunshine, the foliage will have already turned yellow, and root action will have ceased. This action begins again, however, about the end of August, and it would be better to buy imported bulbs than home-grown ones lifted after the roots have commenced to grow, as the best roots and the principal feeders would be injured beyond help by removal, and a second start would have to be made at the expense of the vital forces stored up in the bulb.

To a beginner the difference in shape and size of home-grown Narcissus bulbs and imported ones is perplexing; the latter have very short necks, while of those grown here such kinds as Sir Watkin and Horsfield's often have necks that make the bulb measure six inches in length; this is brought about by the different systems of planting. Our climate makes it necessary to plant much deeper than is the custom in Europe. If we planted as shallow here the plants would be above the soil in fall, owing to the much greater heat here at that period.

As already mentioned, our planting is intended to be a permanent one. And in summer, plants of annual duration will be planted between the rows, such as Mignonette, Asters and other kinds for cutting, and in fall, when the first sharp frosts have killed these, the beds can be cleaned and a good top dressing of well-decayed manure spread on them. The

heavy fall rains will wash this down to the roots and nourish them when they are most in need of help. It will be found necessary every third year to lift, separate and replant the bulbs, owing to the rapidity with which they multiply. In heavy soils the bulbs would soon become so cramped in the soil as to render them flowerless owing to imperfect development, but in lighter soils this would not be so likely to occur. There should be no excuse for a scarcity of Narcissus-flowers in gardens, when it is well understood how perfectly they are adapted for permanent planting, either for naturalization or for the decoration of flower-beds and borders. With a proper selection of varieties they can be had in the open ground from Easter onward for six weeks. The earliest kinds might be so planted that the protection of a frame could be given, and in this way Easter flowers might be assured even in late seasons, but last year there were plenty in the open ground from newly planted bulbs without the least protection.

South Lancaster, Mass. *O. Orpet.*

Fig. 26.—The Silver Maple.—See page 133.

Spring Flowers.

MARCH is a month of anxiety in the hardy-plant garden. The losses usually noted at that time may be the result of hard conditions earlier in the year rather than the constant changes incidental to the month, but at this time we may usually first take note of the losses. With all the continued cold of the past winter the destruction among hardy plants seems less than during the previous much milder season. The few mild periods have started a large proportion of bulbs and hardy herbaceous plants into some activity, and the garden is full of interest. In selecting plants for the hardy garden care should be taken to secure as many as possible of an arctic habit, by which I mean those which spring rapidly into bloom in a few days after the frost releases its hold on the ground. The flowers of these plants are not only among the most beautiful and apparently delicate of any season, but there is a never-ending wonder and charm in their surprising annual appearance. They know their master, and when the sun rises but a trifle they rise to his greeting.

It adds much to the interest of a garden to discover at every mild time throughout the year at least a stray flower or two. Even in our latitude the frost is seldom so persistent that flowers may not be had out-of-doors in warm spots nearly every month in the year. December is usually the barest time, as the ground is then apt to be continuously frozen. This year Snowdrops were in bloom in January in the border, and are still in mid-season. *Anemone blanda* was a close second in February. These plants, I find, are very reliable winter-bloomers, and some established plants in a snug corner are very bright and charming on a sunny day. They range in colors from a not very clear white to a deep pure blue, and the foliage is deeply cut and of a bronzy hue. Some roots of *A. blanda alba* in a border only a few feet distant are only just now starting into growth, so much difference does location make in time of flowering. It would be well to plant *A. Apennina* with *A. blanda*, as this variety follows closely, and would extend the blooming-time of the bed several weeks. My colony of *A. blanda* had a good baking during the summer, and received a mulch in the fall. The latter condition seems important, as they are stronger where the mulch still covers them. From some indications, I am inclined to think that in well-drained soil under deciduous shrubs they would be quite at home.

A Taurian variety of *Scilla bifolia* is proving an excellent early Squill, quite as early as the Anemone. This has flowers of as deep a blue color as *S. Sibirica*, and the blooms are entirely weather-proof, as becomes an early riser. Another Taurian Squill has much larger foliage and of a more true blue shade. This, while scarcely later, is somewhat damaged by hard weather. Muscaris are showing their inconspicuous but lasting flowers, while Chionodoxas are slowly appearing, *C. Sardensis* being most forward. It is rather peculiar that a pan of these in a cold frame are not as forward in bloom as those in the open, though the foliage is more advanced. Winter Aconite (*Eranthis hymelis*) gives a cheerful glint of color, and a stray hardy Primula may be found, though the latter is scarcely a winter flower, like the double Daisy, *Bellis perennis*, which sometimes ventures out in a mild spell, for which temerity they are punished by the first sharp frost. Hellebores seemed such a success out-of-doors last season that mine were plunged in the border early in the year, but without much confidence that the result would change the opinion that they are cold-frame plants—in my garden at least. Looking them over the other day, I found the Lenten section quite ready to bloom, but the Christmas Roses (*H. niger*) entirely dormant, with buds still at the crowns. Perhaps your correspondents, who have bloomed them in the open so many years in succession, have garden conditions more favorable than mine to these desirable plants.

Elizabeth, N.J. *F. N. Gerard.*

Notes from the Harvard Botanical Garden.

Salvia Bethellii.—This excellent variety of *S. involucrata* was obtained from seed some years ago by the English gardener after whom it is named. In many respects it is superior to the species; the habit is more compact and bushy, the flowers more numerous, and of a richer color. No other Salvia flowers so persistently; no other presents such a neat, attractive appearance when in bloom. The entire plant rarely exceeds three feet in height, and it is furnished with dark green, velvety ovate-acuminate leaves, from six to seven inches long, on petioles one-third their length. The flowers are borne in a large, dense, pyramidal, verticillate, erect raceme, with two caducous, ovate bracts, of the same color as the corolla, at the base of each whorl. The corolla is a deep reddish crimson, two inches in length, tubular, flattened, contracted at the top, expanding again in a two-lipped limb, the upper lip densely hairy, and the lower one bearded beneath. Cuttings prepared from the young growth are very easily propagated with bottom heat. They should be rooted in spring, however, so that the plants may be grown in the open ground during summer. They should be taken up and potted in August, or early in September, and afterward treated as Chrysanthemums and other soft-wooded plants that are grown out-of-doors. *S. Bethellii* cannot endure the slightest frost, and it delights in a sunny position and a free circulation of air when under cover.

Tetranema Mexicana.—This is a charming little perennial, scarcely more than six inches high. It was first cultivated in Belgium, some fifty years ago, and is the only member of a genus which is closely allied to Pentstemon. The stem is very short, and thickly clad with opposite, oblong, crenate leaves. The axillary peduncles, bearing the reddish purple flowers in dense corymbs, are produced freely during the summer months. Although much smaller, the flowers in form bear some slight resemblance to those of the Foxglove; and this likeness has been considered sufficient to justify the name of "Mexican Foxglove" for the plant. This name, however, is rather inappropriate. When a Foxglove is mentioned, we turn, naturally, to look for the aspiring stems; but in *Tetranema Mexicana* we find instead a plant of comparatively humble proportions. It is beautiful, but not stately like the Foxglove. Its small size, however, combined with a compact habit, renders it very useful in edging groups of larger greenhouse plants, and its pretty flowers never fail to please. The plant thrives luxuriantly in rich, sandy loam, and it is easily propagated by division or from seeds. The latter are borne in great abundance, and the plants produced from those sown in summer will bloom as profusely in winter, under pot culture, as those obtained from spring-sown seeds usually flower in summer.

The Black Calla.—It is only a year or two since an American firm distributed roots of a plant to which this name was given, with *Arum sanctum* added as a botanical name. The latter name was new, and the impression was thus conveyed that the plant also was new. Some of the roots had been sent here, and the development of the inflorescence was awaited with much curiosity, until the plant turned out to be one which had been cultivated as *Arum Palæstinum* (the correct name) more than a quarter of a century ago. It was introduced from Jerusalem by the Messrs. Veitch, of London, in 1864, and flowered at their nurseries during the following year. *A. Palæstinum* attains a height of from one to two feet, and resembles the common Calla Lily (*Richardia Æthiopica*) in general aspect. The long, drooping spathe is greenish on the outside, and blackish purple on the inner surface; the upper part of the conspicuous spadix is of the same blackish purple color. The fragrance of the inflorescence has been described as similar to that of the Violet; but to most people it calls to mind the odor of decaying Musk-melons. The plant is of no practical utility in garden work, but it may be grown as a curiosity. The treatment given to ordinary Callas will suit it very well.

Cambridge, Mass. *M. Barker.*

Chrysanthemum Queries.—II.

THE following questions, with Mr. John Thorpe's replies, are a continuation of those which we published last week:

"Has the constitution of the Chrysanthemum been impaired by long-continued crossing?"

No; on the other hand, the American-raised seedlings of the past three years are of a decidedly more vigorous habit than those of former years. Raisers of seedlings have now reached the point where they throw away all weakly seedlings, unless they have some new and striking feature which it is desirable to develop in future generations. When my seedlings are about four months old, being generally then in three-inch pots, I discard all plants of puny growth and constitutional weakness, thus doing away with all subsequent trouble, and often the temptation to keep a weakling when in flower.

"How shall we secure a race of Chrysanthemums that will endure our trying climatic conditions?"

If, at any time during May, 500 seedlings are planted in the open ground to which is given fairly good cultivation, there will come a time when some of these plants begin to weaken—that is, they make no progress—and as the trying summer lengthens many others will drop behind, until, probably, at the end of September, your 500 seedlings have a representa-

tion of fifty healthy and vigorous plants only. It is these fifty home-raised plants, then, that have the constitution and the vigor you desire to propagate. We ought to raise American plants for American gardens. A great many of the European novelties in all plants are failures here. It is not that they are worthless originally, but because the conditions they are subjected to are not to their liking. They were born and bred in other surroundings, and, as a rule, are better adapted to them. This, however, is not a rule without exceptions.

"Can strong plants be grown from the cuttings of a weak one?"

When cuttings are taken fairly early, it makes no apparent difference whether from a strong plant or a weak one of a given variety, provided always that they are properly treated afterward. A cutting no thicker than a knitting-needle, if well cared for from the start, should be as strong two months later as one that was originally as large as a lead-pencil. Some believe that permitting a plant to produce only a few flowers tends to strengthen the plant, and the fact is it costs the plant less effort to elaborate one flower than it does fifty. If a plant is allowed to carry all its flowers without disbudding, what a task it has! A single shoot of some varieties has as many as forty buds formed, and when we consider that each flower, when open, carries from 140 to 150 florets, it will be seen that the strain on the plant is a very severe one.

"Is the production of a blue Chrysanthemum possible?"

I do not see why it is impossible, and I hope yet to see a genuine blue Chrysanthemum. The old botanists declared that we could not have blue, yellow and red in the same species of plant. But we have blue, yellow and red Hyacinths, and I see no good reason why we should not get the same colors in the Chrysanthemum. The original colors of the Chrysanthemum-flower were limited to a pale yellow, white and a very weak lilac shade, and from these have been elaborated all the colors and shades we now enjoy in this flower. This has been accomplished by very slow and persistent work in selection and cross-fertilization and by the tendency of the plant to sport. Notice how the yellow shades have been intensified and how many shades there are. The lilac has become pink of pure quality. Cullingfordii oftentimes, when the flowers are closely shaded, presents us with nearly a pure tone of red. The most pronounced purple we have to-day comes from the lightly tipped, incurved Princess of Wales, in the form of a sport named Violet Tomlin. It is a true purple, and we cannot get purple without blue. To those who are hard at work watching the tendencies and developing new forms of the Chrysanthemum, the sudden appearance of a blue one would prove no great surprise. Raisers of seedlings frequently see signs of a new departure four or five years before it actually takes place. A blue Chrysanthemum may first be obtained from a sport.

The Influence of Pollen upon Fruit.—Among many experimental studies which have here been made of Tomatoes growing under glass the past winter, trials of pollinating in various ways have yielded, especially in one case, very interesting and suggestive results. One flower of a cluster was pollinated upon one side of the stigma with the least quantity of pollen which it was practicable to apply; to another flower of the same cluster was at the same time given a superabundance of pollen over the whole stigmatic surface. The two resulting fruits have grown and ripened side by side. The one grown from abundant pollination developed to a normal size, and, when cut through transversely, showed the usual even distribution of placentæ and seeds. The one scantily pollinated, on the other hand, reached only about one-fourth the size of its mate, and when cut like the other, seeds were found on only one side of the fruit; the other side, however, had grown almost symmetrically with it, but, instead of being filled with seeds, contained only the enlarged placentæ, making the fruit nearly solid on that side. This suggests an important field for further study in relation to the influence of pollination upon the development of fruit and related subjects, and it has practical bearings of no little importance.

Cornell University. *C. W. Mathews.*

Saxifraga Burseriana major.—This is an extremely pretty Saxifrage, and is well worth the attention of the gardener. It is a very old plant—at least the typical *S. Burseriana* is—having been described and figured in Jacquin's "Miscellanea" as long ago as 1778. The variety Major is far superior to the type, and has flowers about twice as large, although even on the same plant great variation in this respect is observable. The plants are almost perfectly hardy in England, but it is safer to have them kept in a cold frame during vigorous winters so that the pure white flowers may not be nipped off before their expansion in January and February.

London. *J. W.*

Correspondence.

Protection from Field Mice.

To the Editor of Garden and Forest:

Sir.—I wish to ask through your columns for advice as to the protection of trees, young and old, deciduous and evergreen, from the depredations of field mice. We have had snow on the ground for fourteen weeks, and, as the last of it is now disappearing, the ground is covered with a complete network of their runs. Their nests have been made of the grass under the snow, and they are now easily seen, but the late occupants have migrated. Their work, however, remains. Apple-trees, twenty-five years old, are completely girdled by them so that not a vestige of bark remains where they have been at work, but worse damage has been done among choice trees and shrubs recenly planted. A fine young Copper Beech is stripped of bark for quite two feet above the ground level. The damage was not visible until the snow cleared away, and then the ruin was beyond repair.

South Lancaster, Mass. *O. O.*

[A good way of protecting trees from mice is to tramp the snow hard about the trunks after every storm during the winter. The mice cannot push through the snow when it is packed. If the bark of the tree is washed late in autumn with some preparation distasteful to the mice this will often answer as a protection. Aloes, gas-tar, carbolic acid and sulphur are used for this purpose. After the injury has been done scions are sometimes laid over the girdled space, with their thin ends inserted under the bark above and below and carefully waxed and wrapped. This conservative surgery will in many cases save the tree.—Ed.]

"Insect Lime" for the Gypsy Moth.

To the Editor of Garden and Forest:

Sir.—The reference by Mr. J. G. Jack, in your issue for March 11th, to the almost explosive appearance in destructive numbers of *Liparis monacha* (nonne) in Germany, when discussing the war against an allied species of the Gypsy Moth in this country, leads me to send you a few brief notes from a paper which I read two weeks ago before the Entomological Society of Washington on the former subject almost on the very day when the Gypsy Moth Commission held its sessions in Boston.

It seems to be the world's practice for each community to go on trusting to its own experiences rather than profiting by that of others, exactly as it does in the forestry problem.

What these insect pests mean to a forest-administration will be understood when it is stated that the last ravages of the above-named "nonne" involved an area of over 100,000 square miles, the premature cutting of 55,000,000 cords of wood, and the most inconvenient disarrangement of working plans, which, in a forest-administration, are necessarily laid for 100 or more years in advance.

Many thousands of dollars were spent last year, and many more will be spent the coming year, not in exterminating, but in checking, the pest, until natural causes, like fungus diseases and parasites, will reduce it to its usual limited existence. Many remedies have been proposed and tried, and where such large areas are concerned and such values involved, they were, of course, tried without stinting expense and without losing sight of their practicability. In one district of 2,000 acres of Spruce-forest not less than $12,000 were spent experimentally.

The only really effective remedy was found in the application of bands of "insect lime," a glue specially prepared and extensively used in Germany. This preparation, applied in various ways, is useful against quite a number of insects. It would no doubt be applicable against our Canker-worm; against the Bag-worm, Fall-web-worm and Tussock Moth, and has been found most effective against the Gypsy Moth in its native country.

In this latter case the "insect lime" is best applied toward the end of the winter—that is, just now—upon the patches of eggs which this insect is in the habit of attaching to the outer bark of the trees. The glue, of course, prevents the hatching

of the eggs. The price of this preparation, which is specially manufactured in varying composition by several firms, is $2 per 100 pounds.

Against the "nonne" and other similar caterpillars, which wander up and down trees, a band of insect lime, two inches broad and a quarter of an inch thick, is applied around the trunk, breast-high, after the rough bark has been removed. With improved machines for scraping the bark and applying the glue, and which do the work three to five times as fast as it can be done by hand labor, the cost per acre of Spruce-forest was $1.80, of which $1.25 was for the material; it is, therefore, a cheap remedy. The bark scraper is a simple instrument of the plane type, and the banding machine, an apparatus to put on the glue quickly and of proper size, does not cost more than 50 cents, if purchased from the inventor. I am prepared to give addresses of the firms manufacturing the insect lime and the machines, if wanted, and further details in regard to their application. The effectiveness of the bands is due to the fact that the caterpillars, be it on account of the disagreeable smell (tar-oil) or of their objection to soiling their coats, are absolutely unwilling to cross the barrier, and can be gathered below the band and killed, or die from starvation. The insect lime must, of course, have the capacity of keeping fresh and maintaining its consistency for two or three months in all weathers, and this is the secret of its preparation.

The absolute success of this application as a preventive rather than a cure, and its freedom from the objectionable features which attach to the spraying of arsenic and other poisons, etc., certainly recommend it at least for trial in this country.

Forestry Division, Department of Agriculture, Washington. *B. E. Fernow.*

Exhibitions.

Spring Flower Show at Philadelphia.

THE exhibitions of the Pennsylvania Horticultural Society are always attractive, and the Spring Flower Show, which was held last week, was rather happier in arrangement than usual. Nothing could be much better than the bank of foliage in front of the stage, with the graceful line of Palms rising above masses of green, and just enough of color from flowering plants to relieve it from monotony. In front of the stage, but separated from it by a walk, was a considerable space, covered with flowering plants and shrubs, Azaleas, Hydrangeas, Cytisus, etc., which was very effective, both by itself and in connection with its background. Why are not plants on exhibition arranged on the floor oftener than they are? This is the natural position for the greater proportion of them, and certainly, in this instance, if some of the specimen Palms and Ferns in the great collections had been placed on the floor they would have appeared to better advantage than on the stages, not only because the point of view would have been better, but because the valance around the staging was by no means decorative in itself, and it certainly did not add to the beauty of the plants, either in the way of harmony or contrast.

Apart from the ordinary plants on exhibition there were two groups which attracted great attention. The first of these was Dr. Williams' collection of dwarfed Japanese trees, of which much has been written. The specimens exhibited were said to range from fifty to a hundred years old, and yet they were hardly more than two feet high. What was interesting about them was the contorted and weather-beaten look which gave them a really venerable aspect, in spite of their minute proportions. One of them was a Pine, and the others seemed like different forms of Thuya. The second group consisted of several wagon-loads of Cactuses which Mr. Blanc had sent down from his immense collection. About 300 varieties were here represented in 500 specimens. Many of them were in flower, although this is not the season for them, and many more were carrying highly ornamental fruit. Besides the Cactuses there were some striking Aloes, Agaves, Euphorbias, and Mesembryanthemums. Among the most remarkable of the plants were two Anhaloniums and the so-called Bishop's Head (*Estrophytum myriostigma*). The genus Cereus was represented by some extraordinary and fantastic varieties of *C. flagelliformis*, *C. formosus* and *C. tuberosus*. Of Echinocacti the most interesting were *E. Arrigens*, *E. cornigerus*, *E. turbiniformis*, *E. Texensis* and *E. candidus*. Of the neat little Mammillarias the best were *M. echinata*, *M. elephantidens*, *M. lasiacantha*, *M. micromeris*, *M. pusilla* and *M. sanguinea*. Many other genera were equally well represented, and to large numbers of visitors the display was a revelation of the remarkable variety in form and in size and in habit which these grotesque and beautiful plants assume.

The foyer was bright with blooms of Roses, while of Orchids the best were those of Mr. C. F. Evans, whose plants were hung from the short stumps of branches of a dead Cedar, which was draped with Vines and Ferns. It would be hard to find better Roses than the Ulrich Brunners of Messrs. Pennock Brothers, Edwin Lonsdale and John Burton. In fact, this Rose seemed to justify the reputation which it enjoys about Philadelphia of being the most perfect of all Roses for forcing. Madame Luizet and Mrs. John Laing seemed to be of equal merit as usual, while the Jacqueminots and Wootons and Baroness Rothschilds were remarkably good. The exhibitors already named, with Messrs. Kift & Son, Heron & Nisbit took the principal prizes in Roses. *Lilium Harrisii* was abundantly displayed, and those by W. K. Harris, Michael Sammon and other growers left nothing to be desired. There were but few plants, however, of the more beautiful *L. longiflorum*, which always appears to excellent advantage in comparison with the Bermuda Lily, on account of its much firmer and more gracefully poised flowers.

The collections of choice and rare greenhouse plants from the gardens of the Messrs. E. W. Clark, George W. Childs, A. J. Drexel and H. A. Dreer were, as usual, the central features of the exhibition of this class of plants. One rarely sees anything better than the splendid Pritchardia exhibited by James Long, gardener to Mr. Drexel, or the great Livistona and the *Microlepia cristata* which Mr. Hughes sent down from Mr. Childs' collection. The premium for a new and rare plant went to the gardener of Mr. Drexel for *Spathiphyllum pictum*, who also took a premium for Palms and Ferns.

The Carnations attracted a good deal of attention, and a certificate of merit was justly given to E. G. Hill & Co., of Richmond, Indiana, for a remarkable collection of seedlings, many of them of immense size and of clear distinct colors. Mr. H. E. Chitty, of Paterson, Edward Swain, Avondale, and Charles T. Starr, of the same place, all showed new departures in Carnations, and, undoubtedly, the group, taken altogether, was the finest ever seen in Philadelphia.

Special mention ought to be made also of the new greenhouse Azalea, called Vervainiana, which was shown by Mr. James Dean, of Bay Ridge, New York, for the first time. The flower was double and richly variegated from white to deep crimson. Near by these was also a group of hardy Azaleas of especial merit, which were shown, for the first time in this country, by Pitcher & Manda, of Short Hills, New Jersey. The flowers were of good size and of distinct colors, and they promise to be valuable additions to the shrub-border.

Recent Publications.

Monographie der Abietineen der Japanischen Reiches. By Heinrich Mayr. Munich, 1890, pp. 1–104, with seven colored plates and analyses.

Dr. Mayr, who is now well known in this country, where he has traveled extensively, by his remarkable work on the forests of North America, has devoted some part of the last three years, during which he has occupied the chair of Silviculture in the Imperial University of Tokio, to studying in their native forests the various forms of *Abietiniæ*, in which they abound. Dr. Mayr, so far as relates to the grouping of the species of these trees, follows in general lines the authors who have written before him on this subject. He proposes, however, several new species detected by him during various journeys made in the Japanese forests. These are *Abies umbellata*, a tree which appears to resemble the now well-known *A. brachyphylla*, if one may judge from the plate; *Picea Hondœnsis*, belonging to the group of which *P. Ajanensis* is the best-known representative; *Pinus pentaphylla*, a large and interesting white Pine of the mountains of the central island, where Dr. Mayr discovered it, and related to our *Pinus Strobus*, but with shorter and smaller cones, as they appear in the plate. A Larch from the Kurile Islands is distinguished as *Larix Kurilensis*, and the little Pine which has been regarded a variety of the Cembran Pine of Europe is now considered distinct from that widely distributed species under the name of *P. pumila*.

The attention which is given to the description of cultivated varieties of different Japanese conifers adds particular value and interest to this work for the cultivators of trees, as descriptions will be found in it of many varieties cultivated and esteemed by the Japanese which the tree-lovers of America and Europe now hear of for the first time. Of *Pinus Thunbergii*, for example, nine varieties are described; of *P. densiflora* more than twenty varieties are recognized; of *P. parviflora* six, and of *P. pentaphylla* two; in all, some forty varieties of Pines, of which more than half have already been

distinguished in Japanese works of dendrology, the others now being first characterized by Dr. Mayr.

The views which the author expresses with regard to the specific rank of Japanese conifers may not be all adopted, but his work, based as it is on observations made in the field by a dendrologist of great experience and equipped with trained powers of observation, is a most important and valuable contribution to the knowledge of trees. It would, perhaps, have been more generally useful if the characters of the different species and varieties had been written in Latin instead of in German, and the absence of an index, an inexcusable omission in a work of this sort, makes the pursuit through its pages of synonyms a serious and laborious undertaking.

Notes.

Mrs. S. T. Rorer, principal of the Philadelphia Cooking School, has prepared a neat volume of nearly 200 pages, entitled "How to Cook Vegetables." The book is not for sale, but is very appropriately used as a premium by W. Atlee Burpee & Co., the Philadelphia seedsmen.

The clear red flowers of *Erica carnea*, the Mediterranean Heath, are among the first to greet the eye in Central Park. A colony of these plants covering a rod or so along the bridle-path, opposite Eighty-first Street, is now making a cheerful show as their bright blooms are seen among Trailing Juniper, *Enonymus radicans*, and Scotch Heather, *Calluna vulgaris*.

A plant of *Androsace sarmentosa* in bloom has been sent to this office by Mr. George C. Woolson, who flowered it in one of his cool houses at Passaic, New Jersey. It is one of the prettiest of the genus, and carries a globular cluster of bright pink flowers on a stem rising two or three inches above a rosette of gray-green, softly pubescent leaves. It will probably prove hardy, and, if so, it will be a welcome addition to our list of early-flowering plants.

No. 2 of Volume II. of the *Memoirs of the Torrey Botanical Club* contains an account of the "Spring Flora of South-western Virginia," written by Miss A. M. Vail, who, some months ago, recorded her observations in Garden and Forest. The paper is annotated by Professor N. L. Britton, who describes as new *Clematis Addisonii*, *Pentstemon lævigatus*, var. *canescens*, and *Senecio aureus*, var. *angustifolius*. The same number also contains a paper by Mr. Arthur Hollock, on the "Autumn Flora of South-eastern Virginia."

Bartram's Garden, the first botanical garden established in the New World, and long the most famous spot of its kind in the United States, has, principally through the energy of Mr. Thomas Meehan, been acquired by the city of Philadelphia as one of its smaller parks, and the city has now taken possession of it and appointed a superintendent to preserve it. An interesting account of the garden, and of its founder, John Bartram, and of his son, William Bartram, appeared in the *Public Ledger* of Philadelphia on the 16th of the present month.

Writing to a friend in this country, under date of March 7th, Mr. W. Thompson of Ipswich, England, says: "The worst of our winter is over, I trust, but it is still cold, and plants are backward for us. Pear-trees are making a wonderful show of buds, which looks like the promise of a good fruit-year, although it does not follow that flowers will be perfected in fruit. But we have lost many plants reputed to be hardy, and what have survived may be regarded as hardy beyond all doubt. *Polemonium pauciflorum*, one of Mr. Pringle's plants, has stood well, to my surprise."

Mr. W. Junker, writing recently in *Petermann's Mittheilungen* about the journey he made five years ago between the Albert and Victoria Nyanzas lakes, spoke of the vast Papyrus-swamps which line the banks of the streams, and said that the natives use their stems to construct floating bridges or, where the river is too wide to be bridged, rafts, which are propelled across. In another account of the same region, given lately by Mr. Jackson, it was said that the British East Africa Company is trying to develop the large tracts of country it controls, by planting, in favorable localities, valuable timber-trees from India, as well as by importing colonies of Persians and Indians to start useful plantations of other sorts.

A circular from Mr. Thomas Meehan, which we have just received, states that he is determined to revive the publication of the discontinued "Flowers and Ferns of the United States" in monthly issues. Under the title of "Meehan's Monthly" this publication will contain, in addition to the colored plate of some wild flower, notes on various features of general gardening. The whole will be illustrated with wood-cuts. In the conduct of this monthly Mr. Thomas Meehan will be assisted by his sons, Thomas B. Meehan, J. Frank Meehan and S. M. Meehan. The first number of the periodical will commence in June, and its price has been fixed at two dollars a year. Mr. Meehan's return to horticultural journalism will be welcomed by many readers of the *Gardeners' Monthly* who felt something like a personal bereavement at the discontinuance of that excellent magazine.

The *Jackson* (California) *Ledger* notes the fact that the trees which were planted at the Experiment Station, located on the foot-hills, were obtained from nurseries along the coast, in interior valleys and on foot-hills. The stock was, in each case, thrifty and strong, and all seemed to start under the same conditions, but there is already a marked difference in favor of the trees from nurseries where the conditions of climate and soil are similar to those of the station. These trees have altogether outgrown those which were involved in a sudden change of conditions, and this seems to indicate that, in selecting a young orchard, it would be always advisable to procure trees from a location where the conditions resemble, as nearly as possible, those of the place where the trees are to have their permanent home.

At the nurseries of H. Meyers, Passaic, New Jersey, we observed last week that *Meconopsis Nepalense*, an Indian Poppy, was coming up strong from plants which had wintered with no other covering than some loose litter. These plants came from seed sown last spring in partial shade. It is something of a surprise to find this Meconopsis so hardy. Another plant of the Poppy family, *Eomicon chionantha*, which has already been described in these columns, was flowering in the greenhouse, and it will probably survive our winters out-of-doors. Among other hardy plants flowering in cold frames or in the greenhouse were *Alyssum spinosum*, a trailing species with glaucous foliage and yellow flowers; *Aster alpinus*, and its white variety, with flowers as large as a half-dollar, on stems four inches long; *Geranium tuberosum*, with finely cut foliage and flowers after the style of our common native species; and *Erpetion reniforme*, the Australian Violet.

The death of Mr. John B. Russell, which occurred at Indianapolis on the 11th instant, removed one of the pioneers of American horticulture. Mr. Russell was born at Cambridge, Massachusetts, July 23d, 1801. He was a printer by trade, having been instructed in that art at the famous University Press, in his native town. In 1823 he started a printing establishment in Boston, where he printed the *Christian Register*. In 1824 he purchased the *New England Farmer*, and conducted it in connection with a seed business at 52 North Market Street. His interests now brought him in contact with agriculturists and horticulturists from all parts of the country, and ultimately his offices became an acknowledged rendezvous, where matters of interest to the cultivators of the time were discussed. It was here that the idea of forming a horticultural society was first mooted, and the first public suggestions on the subject were made in an article which appeared in the *New England Farmer* of January 9th, 1829. In that month the office of the *Farmer* was removed from the third to the second story, and the society, when formed, occupied a part of the room vacated by Mr. Russell, and the *Farmer* became the organ of the society, and so remained until its publication ceased in 1846. The society was incorporated in June, 1829, and Mr. Russell at once commenced practical work as general agent of the society, and continued it until 1832, when he sold his interest in the Market Street establishment. After leaving there he engaged in another publishing enterprise until 1839, when he went to Cincinnati, where he became general and commercial reporter for *The Gazette*, which position he held until 1858. Later he was clerk at Washington to the Commissioner of Pensions, and in 1868 he was appointed Librarian of the Department of Agriculture. He retained this position until ill health compelled his retirement. Mr. Russell was the last surviving corporator of the Massachusetts Horticultural Society. Although hardly a surprise, on account of physical infirmity and increasing years, his death is much regretted by those about Boston who know of the good work he accomplished when laborers in the field of horticulture were few. There is much to interest readers of the present day in Mr. Russell's "Reminiscences of the Massachusetts Horticultural Society," which appeared in *Tilton's Journal of Horticulture*.

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The Movement for Better Roads.

THE agitation for improved systems of road-construction and road-maintenance has become so general throughout the country that it may be fairly said to have attained the dignity of a popular movement. The subject is calling forth articles by writers of authority in our leading magazines and weekly journals, in the bulletins of scientific societies and state experiment stations, and in pamphlets issued by various associations organized for economic reform. The Governors of half a dozen states have felt impelled to invite attention to the importance of the subject in their annual messages; in several of the states, notably in New Jersey, laws have been enacted during the winter which overthrow the traditional methods of highway repairs, and in other legislatures bills are under consideration, with a probability that they will become laws, which provide for state aid and expert supervision in the maintenance of highways, and it is proposed in more than one instance to use the direct-tax money which has been returned by the general Government to individual states as a permanent fund for the improvement of country roads.

The sentiment in favor of reform in this matter would be still more urgent if the mass of the people had any experimental knowledge of the superiority of good roads over poor ones. When farmers can be shown by actual practice that good roads, by enabling them to double their loads, add to the value of everything carried away to sell, save minutes or hours every day which amount to days and weeks in the year, and bring them closer to markets and amusements, and schools and churches, they will urgently demand a reform which promises to add so much to their comfort and profit. And they will be still more eager for this improvement when they find that it costs one dollar to keep in repair a good macadam road instead of the five dollars which they have been paying in taxes to maintain the same length of dirt road, upon which, even when in fair condition, three horses are required to haul the load which one can draw on a properly metaled surface.

But one of the special duties of this paper is to invite attention to the value of natural beauty, and we wish here to emphasize the arguments quoted last week from the report of the New Hampshire Forest Commission. Every census shows that the population of our cities is growing at a more rapid rate than that of the rural communities; and every year the proportion of the city population which escapes to the country for summer rest and recreation increases quite as rapidly. The people of the country enjoy and appreciate natural scenery, no doubt, but to those who have been confined to blocks of stone for eight or ten months of a year it has a charm of freshness and novelty that brings intense delight and unspeakable refreshment. Good roads not only help the country on its way to the city, they invite the city to enjoy the pleasant prospects of the country. The bit of New Hampshire road-bed on page 152, reproduced from a photograph by Dr. W. H. Rollins, of Boston, is by no means a model of construction, but the illustration altogether is its own excuse for being. The happy brook as it flows out into the sunshine from under the shade of lofty trees and the hint of forest-covered hills in the distance unite to make a bit of scenery which every one will recognize as a typical one in the New England hill-country. Such prospects are to be found there by the hundred, and only the instinct of an artist is needed to select a view-point from which the landscape will present a richness of composition, a harmony and balance which make a perfect picture. Such scenery is a part of the natural wealth of any region. It is not only a priceless inheritance of delight to the eye and the imagination, but it has a productive value in attracting strangers. The building and maintenance of good roads and paths in such a country are investments which will bring even more abundant pecuniary return than they will in strictly agricultural regions. Indeed, there are many parts of the world which are famous for their natural beauties alone, and the only way to make these attractions available is by perfecting their system of public roads.

One who is preparing a home in the country will always find that it is as profitable to secure the counsel of a landscape-gardener, if his grounds are to be laid out to the best advantage, as it is to take the advice of an architect in the construction of his house. Indeed, as has often been insisted on in these columns, the two ought to work together from the very outset; for just here the training of the landscape-gardener will be found of especial value in selecting the precise location of the building. But a great many houses throughout the country have not been designed by architects, and, of the grounds about them, not one in a hundred has been planned in accordance with professional advice. Of course, many of these houses are ugly and inconvenient, and the same is true of their surroundings. But we have all seen country houses which look as if they were made to live in, and in which their occupants find life a pleasure; and these houses nestle cosily in the exact spot where they belong, and are so naturally connected with it, by shrub and vine, that they seem to have developed there as an integral feature of the landscape; and yet no professional designer has ever aided in planning either house or grounds.

Such "house-scenes," however, are not likely to come by chance. They are the result of thought and taste. They are the expression of careful study and long labor by some one, although the labor has been one of love, for there is no more fascinating occupation than a serious attempt at designing the home-acre. In no other way than by actual practice can the amateur appreciate how much is meant by the word "design." At every step he will find problems to puzzle him which an expert might solve at

once. But, after all, if one is in earnest to make the most of his situation the task will always be delightful, and the result will often be most satisfying. Any one can learn how to propagate and plant and make trees and shrubs grow if he takes time enough and interest enough, and, perhaps, the best course is that usually adopted by amateurs, which is to begin and profit by mistakes. But only the select few can make pictures with this material after they know how to grow it. Only "the prophetic eye of taste" can see how a landscape will appear in twenty years—after saplings have expanded into trees and a bleak hill-side is converted into a forest. Fewer still are they who can create an ideal scene which will be worth waiting twenty years to realize while it is growing in beauty and interest every day. Very instructive would be a series of pictures of the grounds about some country house, beginning with a map and view of the place in its original condition, and followed by a succession of illustrations taken every year in which the development of the scene to its ultimate fulfillment could be traced.

In this number we begin the publication of some sketches of the trials and joys of an amateur in landscape-designing, which will in some degree supply the place of such a panorama. If a faithful record of failures as well as of successes is given, the articles will prove as helpful as they are entertaining. They certainly will find sympathetic readers among that large class of persons who have at some time been lured into an effort to model and decorate a portion of the earth's surface in accordance with their personal views, and who, of course, have never outgrown their interest in such matters, for the garden-habit, when once fixed, is never completely overcome.

Rafinesque.

MR. THOMAS MEEHAN has lately printed in the *Public Ledger*, of Philadelphia, some new and interesting information about the Sicilian botanist Rafinesque, one of the most brilliantly endowed naturalists who have studied the flora of North America—a man who, from personal peculiarities partly and partly from the literary and scientific eccentricities of the latter part of his life, was not appreciated by his contemporaries in this country or valued at his true worth by the generation which followed them; and it is only in our time that naturalists are beginning to realize the breadth of Rafinesque's mental equipments and the justness and value of many of his observations. His theory, for example, now universally acknowledged, that new species and genera are being continually produced by derivation from existing forms, appeared the utterances of a madman and entirely outside the teachings of the theological faith which before Darwin's time had not lost its hold on scientific thought. The burial place, even, of this remarkable man long remained unknown, and it is only recently that it has been located in an obscure lot in Ronaldson's Cemetery, at the corner of Ninth and Catharine Streets, in Philadelphia. The plan of removing his remains to a more honored spot and of marking his resting-place with a simple monument will be approved by every American naturalist.

Rafinesque's will, rescued from oblivion by the energy of Mr. Miller Reeves, of the *Public Ledger*, throws much light on the history and character of the man, and in bringing to light his domestic history gives a clue, perhaps, to the cause of some of the eccentricities of the latter years of his life. It is not very creditable to the intelligence and public spirit of the Philadelphia of fifty years ago to find that "one who evidently lived to do good as he understood it—who supposed he would have, when he made his will, not only something for his family, but enough to warrant a thought of benefiting orphan girls—should die in a garret on Ray Street, between Third and Fourth Streets, in the midst of his great collections, with nothing but a hard cot for furniture and no living soul at hand to close his eyes," and that "the medal he hoped should forever remain in his family should be summarily tossed into the mint as old gold; while the manuscripts, which should be judged by 'The Medical Flora of the United States' a truly valuable work even to this day—manuscripts on which he had depended for legacies and reputation—should have been sold for $5 only, while even the herbarium paper brought over $20; and that his great collections of books and objects of natural history—costing $7 to catalogue, $8 to clean, $6 to carry and $4 to help fill eight wagon-loads to the auction mart—should have only realized $22.29."

Rafinesque was evidently of opinion, when his will was written in 1833 (he died in September, 1842), that he was a man of means. In it he bequeaths his "immortal soul to the Creator and Preserver of the universe, the Supreme Ruler of millions of worlds soaring through space, to be sent to whatever world He may deem fit and according to His wise laws." Secondly, he provides that his body should be cremated, that it "may not contaminate the earth and be the cause of disease to other men." In the third clause he leaves his personal property, consisting chiefly of scientific collections, books, patents, secrets and claims, to his sister, Georgette Louisa Rafinesque, married to Paul Lanthoes, of Bordeaux, and to his daughter, Emily Louisa.

The fourth clause of the will is, perhaps, the most interesting in the light it throws on the personal history of the testator. "While residing in Sicily," it relates, "I deemed myself lawfully married from 1809 to 1815 to Josephine Vaccaro, although the decree of the Council of Trent forbade our regular marriage. In 1811 was born my daughter Emily, and in 1814 my son Charles Linnæus, who died in 1815. But on hearing of my shipwreck in 1815, Josephine suddenly married Giovanni Pizzalour, a comedian, and dissipated the property I had left in her hands. She also refused to send me my daughter, for whom I sent in 1816 and 1817 two brigs in succession to Palermo, the Indian Chief and the Intelligence, wherefore I have ever since refused to notice her and do not leave her a single cent of my property, as she has another family by a living husband."

The sixth clause provides that his books, maps, engravings and collections of natural history, etc., shall be sold and the proceeds used by his executors to print and publish "my manuscripts, sketches and maps in the cheapest form in America or Europe in English or French, unless the copyright can be sold. These posthumous works of mine to be sold at an advance of one hundred per cent. and one hundred copies at least to be printed. The proceeds of these copyrights or sales are to form the fund of my inheritance, to be equally divided between my sister and daughter."

The eighth section names a number of these unpublished works, namely, "The History of American Nations," "Travels and Researches," "Tellers or History of Mankind," "Monuments of America," poem on "Instability," "My Biography," and places them in the hands of Professor John Torrey, of New York, and of Professor Jacob Green, of Philadelphia, his executors. Number seventeen provides that the gold medal, which was so summarily turned into the mint, and which had been awarded to Rafinesque by the Geographical Society of Paris, shall be left to his nephew, Jules Rafinesque, on condition that it is to be kept in the family of Rafinesque "as an honorable record and as a reward of merit."

Section twenty-one is pathetic in view of the amount derived from the sale of the collections and manuscripts. It provides that "if the proceeds of my estate and posthumous works, patents and inventions should exceed the sum of $10,000, or 50,000 francs, I direct that the interest, whatever it is, be put at compound interest in a savings-bank for the benefit of the first female orphan school which shall be established in the United States as near as possible on the plan of Gerard's Orphan College for boys, and if none is established within ten years after my decease, I give the same excess to the first free library that shall be established in fire-proof buildings in the United States."

An inventory of the estate with the executors' accounts is filed with the will. This last shows that when the estate was settled, after all the collections and books had been sold, including the $6, which seems to have been all the ready money Rafinesque had at the time of his death, the estate was indebted to the executors to the amount of $13.43.

How We Renewed an Old Place.

IN describing some very humble attempts to bring order out of chaos in a bit of one of "the unreclaimed farms of Massachusetts," my object is partly to acknowledge a debt to Garden and Forest for the many practical suggestions which have been a help in bringing harmony and beauty out of neglect and desolation; and at the same time to show its readers the pleasure and interest of endeavoring to create, under its inspiration, a garden and forest of one's own.

The experiments that I relate are by no means completed, and the mistakes made will call for sympathy, as the successes will claim congratulations; but to those who will kindly go with me

along the way we have come, at all events the story ought to show what can be done with moderate expense, by the aid of such excellent publications as are now within reach of every one, and how, by loving labor, the old may be made to add charm and dignity to the new, while the new lends purpose and meaning to the old. What has given so much delight in doing, must, it seems to me, give pleasure when told, and it is in this hope that I venture to detail our very simple experience.

I.—THE OLD PLACE.

In the very heart of old New England towns there may often be seen some dilapidated house falling into ruins, surrounded by half-dead fruit-trees and straggling shrubs, while an adjacent garden, once productive and blooming, runs to waste beside it. Its gates are off the hinges, the fences falling to pieces, the hedges untrimmed, the flower-beds smothered in weeds, coarse burdocks and rampant wild vines encumber the ground and run over into the highway, the trim paths have disappeared, the out-houses are toppling over; forlornness and abandonment speak in every line of the decaying house, the former gentility of which renders its decline still more melancholy.

It was such a dreary old place as this which attracted our attention when we first came to settle in Massachusetts. Why such a desirable spot should have fallen into disrepute was always a surprise, for the situation in itself was excellent, the estate running for nine hundred feet along the main street of the town, and lying about half-way between the two villages known in popular parlance as The Plain, and Broad Bridge, so that it was only a quarter of a mile from the post-office of one, while the railway station of the other was within a ten minutes' moderate walk for a man. Moreover, it commanded one of the loveliest inland views possible, and had an unusual variety of surface to make it interesting, as well as a fertile soil for grass and garden.

The view was what particularly appealed to us, for it comprised a charming stretch of salt meadow with a blue stream winding through it like a ribbon, skirted by low, heavily wooded hills, with a distant glimpse of houses overtopped by the masts of the shipping in the harbor. From the higher levels of the farm one could catch a glimpse, when the leaves were off the trees, of a strip of blue sea, and Boston light could plainly be seen revolving after sundown, while of a still evening the monotonous roll of the waves upon the beach could be clearly heard.

The old house, which we vainly tried to find habitable, had stood for 200 years, and must have been a fine dwelling in its day; its rooms, though low-ceiled, being spacious and numerous, and their outlooks picturesque. It was ill-planned for modern comfort, but many of its contemporaries in this ancient town are still occupied, and by a little alteration made very comfortable; still, owing to neglect and ill usage by tenants, the owners having long since moved away, it was in a condition of hopeless disrepair. The floors had settled, and the walls with them, until, in some of the lower rooms, there were gaps beside the beams of the ceiling in which rats or squirrels had made their nests, so that supplies of nuts were to be seen safely stored away in the holes. The window-panes were broken, the shingles moss-grown and ragged, the chimneys falling into ruins and the sills had rotted away. Moreover, the road that wound by the door had been so raised by the accretion of 200 years that the part of the place around the house lay in a hollow, and, there being no one to complain, the town dug water-ways and coolly drained the road over the surface of the ground, so that after a spring freshet piles of sand were to be found all over the grass, giving the farm a water-logged aspect that added to its disrepute.

From this, and from the fact that, situated as it was between the two villages, it formed absolutely a part of neither of them, to us an advantage rather than a drawback, but to the town's-people an objection; it resulted that when the farm was put up at auction, some ten years ago, no purchaser could be found at any price. Finally, convinced that the land was worth more without the house than with it, the owner took it down, and, to the great amusement and consternation of the old farmers who despised the spot, we bought the place for a moderate sum, having convinced ourselves by careful examination that it would at least give us an occupation for the rest of our natural lives to get it into condition, and as that was what one of us wanted, we were disposed to try what could be made of it, and confound our critics.

Then arose in the village a murmur of disapprobation and superior wisdom, such as is apt to follow any purchase in a New England country town.

"What does the doctor want of that forlorn old hole? Only a salt-ma'sh to look at, and the road a-drainin' right into it all the time. Ain't no place to put a house; too shady and wet where the old one was, and ef he goes up on the hill he'll jest blow away. Used to be a good farm in the old man's time; best garden spot in town, but pretty well run out now; and the fences! It'll take all he'll earn to keep them fences in repair; half a mile o' fencin' ef there's a rod."

And so the croaking went on behind our backs, and sometimes to our faces, with only a word of good-will now and then from people who recalled the charm of the old place when it was in the hands of the family, and hoped that something of it might in time be restored.

We ourselves, left face to face with our bargain, went over the land, now our own, and took heart of grace as we planned our first improvements, and decided on a site for the house. When we took an account of stock this is what we found:

A curiously shaped piece of land, something like the state of Maryland, omitting the eastern shore. The long front of about nine hundred feet, lying upon the main street, at its southern end was nearly six hundred feet in depth, but this part of the place was a barren gravelly hill, which had been pastured until nothing was to be found upon it but a thin, wiry grass full of white weed and a growth of short briers. In the autumn it was a blaze of Golden-rod. The hill sloped steeply to the north and north-east, so that the side of it was exposed and cold, the wind sweeping up across the meadow from the sea in bleakest gusts. This we at once determined was the place to plant Pines, with a view to a subsequent forest. At the foot of the hill was a fertile swale of excellent grass-land, which intervened between it and a second rise of land, which was the termination of another gravelly hill, through which the main street had been cut, leaving upon our side a small knoll, from which the ground sloped in every direction, making a perfectly drained and slightly elevated spot for a house, an excellent, but rather limited situation, perfectly barren of trees, and requiring much grading.

On the north side of this knoll was another abrupt slope, and then the ground swept on below the level of the highway, gradually narrowing, as a back street, running obliquely, came to intersect the main road at the northern extremity of the place, where was an Apple-orchard of immense old trees whose bending boughs swept the ground; and in the very point a wilderness of Locusts and Wild Cherries.

The site of the old house, shaded by some fine Elms and White Ashes, was too near both streets to be at all desirable, though the shrubbery and the tangled remains of an old flower-garden rendered it very attractive, but at the rear the salt-marsh was in too close proximity, and about half an acre bordering on the back street was so overflowed at times by salt-water that it would only afford a crop of marsh-grass.

The neighborhood of this meadow was thought to be one of the drawbacks of the spot by many; but, knowing that it was perfectly wholesome, and certainly beautiful, to us it was only an added advantage, so long as the gravelly knoll gave us so good a foundation for our dwelling.

Our first problem, the fences, we determined to deal with by planting Willows. The barren hill-side was to be screened with Pines, and our manner of procuring and setting these will form the subject of my next paper.

Hingham, Mass. *Mary C. Robbins.*

Notes on North American Trees.—XXV.

63. *Acer grandidentatum* is a small tree, of the Sugar Maple group, scattered in a few rather isolated situations in the central mountainous region of the continent from western Montana, where Nuttall discovered it many years ago, to northern Mexico and western Texas. It has small, pale leaves, only two or three inches across, deeply three-lobed, with mostly acute or sometimes obtuse lobes. The flowers and fruit are not to be distinguished from those of the Sugar Maple, except that they are sometimes a little smaller, and I can find no good characters by which to separate this western tree from our eastern Sugar Maple, to which it appears joined, botanically and geographically, by a tree of the Gulf states with small obtusely lobed leaves, often pale on the lower surface, and with small flowers and fruit. This is the *Acer saccharinum*, var. *Floridanum*, of Chapman ("Fl. S. States," 81), which is found from western Florida to western Texas, where I have collected it on the banks of the upper Cibolo River,

not very far from the town of Bœrne. This passes, on the one hand, into the mountain form of the west which reaches the Guadaloupe Mountains of Texas, and on the other into some of the small-leaved forms of the variety *nigrum* of the Sugar Maple of northern Alabama and of Tennessee. Considered in this way the Sugar Maple is the most variable of our species, always within certain limits, and the most widely distributed in its range, with the exception only of the Negundo. The fact that the Sugar Maple sometimes bears stipules, as was recorded by Professor Gray many years ago (*American Naturalist*, vi., 767; vii., 422), is interesting, as the presence of these organs has not been noticed in other Maple-trees, although I find, sometimes, a minute caducous fringe of white hairs on the enlarged base of the petioles of Negundo which appear to be stipular in character. On some individual trees of the Black Maple in Indiana and in central Michigan these large and well-developed puberulous foliaceous stipules are not uncommon. An illustration of them appears on page of 149 this issue, made from specimens for which I am indebted to Professor W. J. Beal. These stipules are said to appear constantly, year after year, on the same trees, but, in spite of this, can hardly be depended on to distinguish the Black Maple, even as a variety, as the individual trees which produce them are confined to a few isolated localities, and they are not present, so far as I have been able to examine them, on trees in other parts of the country.

The Black Maple in the extreme form, which appears in central Michigan for example, is certainly a very distinct tree. There it often has large, thin, three-lobed leaves with broad shallow sinuses, the sides of the basal sinus overlapping so that they seem almost peltate. The leaves are villous or densely pubescent on the lower surface, and sometimes furnished with large foliaceous stipules. Their sides drop, as Professor Bailey has pointed out (*Botanical Gazette*, xiii., 213), when they are fully grown, like pieces of old limp cloth, giving to the trees a heavy dull appearance which makes it easy to distinguish them at a considerable distance. But this is the extreme form, and many intermediate forms occur which connect it with our common eastern Sugar Maple and make it impossible to look on the Black Maple as a species.

The question of the correct specific name of the Sugar Maple is not easily settled. Linnæus bestowed upon the Silver Maple the name of *Acer saccharinum*. The identity of his *Acer saccharinum* is made clear by his description published in the first edition of the "Species Plantarum" and by the specimen upon which this description was based preserved in his herbarium. Wangenheim, some years later, when he described the true Sugar Maple, misled probably by the vernacular name, transferred to this tree the name of *saccharinum*, already appropriated to another tree. Here began the error which has been continued by nearly all writers on our trees. The next name given to the Sugar Maple, about which there can be no question of identity, is Michaux's, *Acer barbatum* ("Fl. Bor.-Am.," published in 1803). Marshall had published in 1785 his "Arbustum Americanum," in which *Acer Saccharum* is described, and it is held by some authors that this is an older name of the Sugar Maple than the *A. barbatum* of Michaux, and that being a different word from *saccharinum*, the Sugar Maple must be called *Acer Saccharum*. A name, however, cannot be adopted as long as any doubt exists as to the identity of the plant to which the author applied it, and in this case it is not at all certain what tree Marshall had in mind when he described his *Acer Saccharum*. He enumerated six Maple-trees; of the identity of three of these, *A. Pennsylvanicum* (*A. striatum*, Lam.), *A. Negundo* and *A. Canadense* (*A. Pennsylvanicum*, L.), there is no doubt. The others are *A. glaucum*, the "Silver-leaved Maple," which he describes with flowers of a deep red color, adding that "it is perhaps the *A. rubrum* of Linnæus." "The leaves," he says, "are five-lobed, somewhat toothed or deeply and irregularly sawed on their edges. They are pellucid green on their upper side and a bright silver color on their under." This may be either the Scarlet Maple or the Silver Maple, the color of the flowers indicating the former; *Acer rubrum*, of the identity of this there can be no question, as the flowers are described as scarlet and pedicelate; and *A. Saccharum*, by which Marshall may have intended the Sugar Maple, the only other species of his region which he had not described, provided his *Acer glaucum* can be held to be the *A. saccharinum* of Linnæus; but Marshall's description of his *A. Saccharum*, the only thing we have to depend on, cannot be made to cover the Sugar Maple, as he says it flowers in the manner of the Scarlet Maple, which seems to imply a species with precocious flowers, either the Scarlet or the Silver Maple, and as the flowers are said to be of an "herbaceous" color, it is probably the latter, a view which is strengthened by the name, *Saccharum*, probably a misprint for *saccharinum*, rather than the Latin substantive. But as the identity of this plant cannot be satisfactorily determined, for Marshall left no herbarium, the only safe way is to pass over his name entirely and take up that of Michaux. If this view is adopted, our Sugar Maple becomes *Acer barbatum*, Michaux, and its varieties *Acer barbatum*, var. *nigrum* and var. *Floridanum*.

67. *Negundo aceroides.*—There seems no sufficient reason for retaining the genus Negundo, established by Moench, who dismembered Linnæus' genus Acer in doing so. American authors, following Torrey and Gray, have adopted Negundo, although Professor Gray as long ago as the appearance of the second volume of his "Genera Illustrata" suggested that Negundo was hardly distinct from Acer. He continued to retain the genus, however, in later publications, and in this was followed by Bentham and Hooker in the "Genera Plantarum." Other and later authors, including Maximowicz, Baillon, Koch and Pax, have reunited Negundo with Acer, and I shall follow them in the "Silva of North America," as Negundo only differs from Acer in its pinnate or ternate leaves and in the linear anthers of our species, and take up the Linnæan *Acer Negundo* for our Box Elder. The California tree, which cannot be separated specifically from the eastern form, will have to be known then as *Acer Negundo*, var. *Californicum*. Viewed in this way, the genus Acer may be divided into two sections, as proposed by Maximowicz:

1. Acer.—Flowers polygamous or dicœcious, petalous or apetalous. Leaves simple.

2. Negundo.—Flowers dicœcious, apetalous in the American species. Leaves pinnate or ternate.

Charles S. Sargent.

New or Little Known Plants.

Viburnum dilatatum.

THIS shrub is widely distributed and very common in some parts of Japan, and is not rare in central China. It is rather remarkable, therefore, that it has so long escaped the attention of American and European gardeners, as in the autumn, when its brilliant red fruit covers the branches, it is, perhaps, the most ornamental plant of the genus known in gardens, and by far the best of the recent additions to the list of shrubs which can be cultivated in the open ground in this climate.

Viburnum dilatatum was introduced into England several years ago by the Veitches, in whose nurseries, near London, it flowered in 1875, their specimens supplying the material from which the figure, published the next year in the *Botanical Magazine* (t. 6215), was made. It apparently did not fruit in England, and was soon lost from cultivation. Seeds of this Viburnum were received in 1880, at the Arnold Arboretum, from the Agricultural College at Sapporo; the plants raised from this seed flowered a little in 1888, but it was not until two years later that they produced fruit in profusion and displayed their true ornamental value.

*Viburnum dilatatum** is a stout shrub, growing to the height of eight or ten feet, with spreading, pale, warty branches, clothed, when young, with short rigid hairs and rather obtuse reddish brown winter-buds covered with thick, pale tomentum. The leaves vary from two to five inches in length, and are often as broad, or broader; they are orbicular, or orbicularovate, or obovate, coarsely toothed, and often end abruptly in a short obtuse point. They are dark green above, paler below, the two surfaces covered with white hairs, and are destitute of stipules, and borne on short, stout, hairy peduncles. They turn very late in the autumn, here, to a dull yellow color, and remain on the branches until the beginning of winter. The flowers are white, short-pediceled, a third of an inch across, with a pilose calyx with short, obscurely toothed and circular lobes, and a rotate corolla hairy on the back of the lobes; and are produced in many-branched sessile

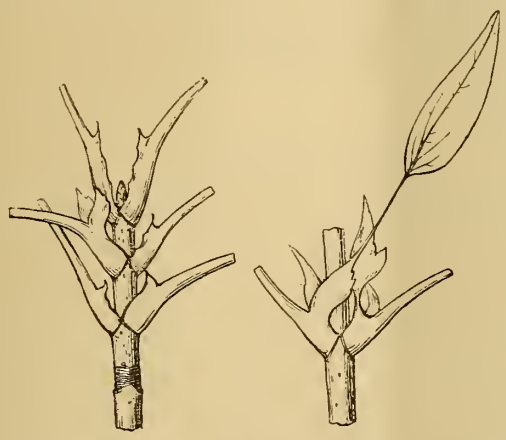

Fig. 27.—Stipules of the Black Maple, var. nigrum.—See page 147.

or pedunculate hairy cymes, four to six inches broad, and open, in Massachusetts, toward the middle of June. The fruit ripens in September; it is ovate, much flattened, a third of an inch long, and crowned with the remnants of the persistent calyx and style. It is very abundant in large broad clusters, and is bright red, or red slightly tinged with orange, and remains on the branches here until the beginning of winter.

Viburnum dilatatum resembles, in general habit, our common eastern *Viburnum dentatum*. It requires deep, well-drained, rich soil, in which it grows rapidly, soon forming broad masses of handsome foliage. The illustration on page 150 is from a drawing, made by Mr. C. E. Faxon, from one of the plants raised in the Arboretum.

C. S. S.

Cultural Department.

Choosing Varieties of Apples.

MUCH which is written upon the subject of the choice of varieties for an orchard fails to commend itself fully to my judgment. Of course general recommendations can have no more than a general character; but, necessarily, such should not be too sweeping or without suggestion of exceptions.

The most frequent advice given is to plant but a few standard sorts and to avoid setting much early fruit. Such advice is common from those who have most widely erred in both particulars; but these persons are not likely to view the situation impartially. A good deal of money can be made by the right man, rightly located, in growing choice early varieties as a specialty. There is a large consumption of mild-flavored, mellow, early apples, and this can be indefinitely enlarged by supplying the market with well-grown early fruit in perfect condition. To do this business rightly, and to the best advantage, not only must choice productive kinds be planted and carefully tended, but such apples should be treated as carefully as choice peaches, and a market secured in advance. The most careful picking, packing and subsequent handling are essential, and cold storage ought to be provided as a protection against temporary gluts. Even the earliest varieties, if gathered properly at just the right time, may be held without harm in cold storage for several weeks if necessary. But it is rare that this is required with strictly choice fruit.

Very unwise, it seems to me, is the constant warning against varieties which are not of the highest quality. Many buyers of fruit have no great delicacy of taste, a faculty easily destroyed, when originally possessed, by some prevalent habits, the chief of which is the habitual use of narcotics and stimulants. The delicate, finely flavored apples, favored by connoisseurs, have not "taste" enough for the majority of buyers. Such persons require a degree of acidity which would be called "screeching" by more refined palates. The public generally are attracted by size, color and moderate tenderness of flesh.

In putting out an orchard we are counseled rightly, as a rule to set only standard sorts, well established in general repute. But there is such a thing as going too far in this direction. I am convinced by much experience and long observation that an orchard of one or two varieties is much less likely to produce full crops than one in which there are a dozen sorts, of different seasons, promiscuously planted. There need not be many of the sorts least in demand, and when we understand the true conditions we may furnish our orchards with abundant pollen without the risk of much unsalable fruit. Popular sorts noted as heavy and regular bearers when planted alone, of which Oldenburgh is a conspicuous instance, are desirable to some extent in every orchard; but as all varieties are not in bloom at once, the late bloomers which are apt to have a scanty yield of pollen would do best if accompanied by strong bloomers of the same blooming season. Probably the largest orchard in Vermont has proved a financial failure, as I believe, by neglect of the precaution here indicated; and I am inclined to the belief that the few orchards which gave full crops in 1890 did so because they were of mixed varieties, embracing a good share of freely polleniferous sorts covering the whole blooming season.

While the public is undoubtedly shy of unknown sorts of little exterior attractiveness, it is not necessarily so with a new variety of fine appearance and fair quality. This is shown by the quickness of several new sorts to win approval. The Yellow Transparent is a conspicuous instance of this; and from my own experience with the Wealthy, I do not believe there will be any difficulty whatever in finding a good market for it. Those to whom this variety was shipped from my orchards last fall seem to be anxious to buy all that can be supplied hereafter.

It is different with unattractive apples, and I would never advise extensive planting of such, except in the case of a high local repute, gained through a series of years. Some of the choicest dessert apples grown, and among them some sorts well known and widely distributed, and productive withal, have never been easy to dispose of in the general market. Peck's Pleasant is a variety of this sort.

The vogue of some apples seems entirely unaccountable to many who have written on the subject. The most extensively grown apple in America, Ben Davis, or New York Pippin, is a conspicuous instance. In the valley of the Mississippi and its tributaries it is the omnipresent fruit from December to May. It is large, it is productive, it is handsome, and a good keeper. It can be so grown as to be a fairly good apple,—equal, perhaps, to the average Baldwin; but, as we find it generally, it seems to well deserve the savage criticism visited upon it, even by men who are growing it for market by the hundred acres. But, as a living dog is better than a dead lion, and as there are few productive, long-keeping apples suited to our great valley, which are, at the same time, attractive to the eye and reliable in productiveness, it is not surprising to find Ben Davis holding its own there, and even intruding, as at present, into our eastern markets.

Newport, Vermont. *T. H. Hoskins.*

Points in Chrysanthemum Culture.

Protecting Plants in Flower.—A few years ago, when I described my so-called "Snug Harbor," I had no idea it would become so generally used as it now is throughout the country during late October and early November. It is simply a frame-work of wood, built on the model of a greenhouse—either equal span, three-quarters span, or half span. Before the plants are in flower, the sides and ends are covered with any kind of burlap, scrim, or other canvas. This is secured in position by being stretched tightly, and then held by

* Thunberg, "Fl. Jap.," 124.—Siebold and Zuccarini, "Fl. Jap. Fam. Nat.," ii., 171.—Miquel, "Prol. Fl. Jap.," 154.—Franchet and Savatier, "Enum. Pl. Jap.," i., 200.—*Bot. Mag.*, t. 6215.—Maximowicz, *Bull. Acad. Sci. St. Pétersbourg*, x., 664.—Forbes and Helmsley, *Jour. Linn. Soc.*, xxiii., 351.

nailing laths over it at bottom and top and horizontally at distances of about four feet. The roof is also of canvas on rollers, so that it can be removed during fine days, the rollers being secured by ropes, whether the canvas be up or down. This method of protection has given great satisfaction, but, like all experiments, there is generally room for improvements. A glass roof, formed of ordinary hot-bed sash, six feet by three, and costing about two dollars each, is now recommended together with a canvas to let down over on hot days and frosty nights. The canvas sides are to be kept as in the original plan. This canvas roof covering will keep out fully seven degrees of frost, providing, of course, everything is snug and tight. The temperature of a greenhouse, glazed with large glass and without any fire heat, will be found as cold as the outside temperature within three degrees when the thermometer registers thirty degrees or lower; the canvas, therefore, affords very great protection from frost.

Growing the Plants.—Where it is practicable, the best plan for growing plants for such structures is to set them where they are to remain. They should not be planted before the first of May, and plants from three-inch pots are better than larger ones. Where old plants are used, no more than two shoots to each one should be allowed to grow, their distance apart being determined by the style of cultivation which is intended. If the plants are to be kept low and bushy, two feet six inches each way will be near enough; if there is head room sufficient for them to grow as high as five feet without being bushy, twenty inches apart will do. The plants should be pinched about the end of June, and as soon as they have broken, three of the strongest shoots should be selected and all the others should be rubbed off. The plants must be staked neatly and kept tied, so as to prevent their being broken or whipped by winds. Early in September the best buds should be selected and all lateral ones removed. It is entirely a matter of taste how many buds are allowed to remain; if the very largest flowers are desired, then from four to eight buds are enough; but for medium-sized, smoothly-finished flowers each plant will carry ten to twenty.

Fig. 28.—Viburnum dilatatum.—See page 148.

A New Style of Paper Pots.—Where it is not convenient to grow the plants in the structure they are to flower in, there are several ways of treating them: in pots plunged in the ground, or planted in the open ground and then removed just before the flowers open. This may be the most convenient way to give them the necessary attention during summer. Last season, in growing about a hundred plants, I made use of a new device and was delighted with the results. About the middle of June I had holes dug, a foot deep, a foot wide, and three feet apart. On the bottom of each hole was placed a piece of inch board nine inches square. A block of wood, the shape of a flower-pot, ten inches high and nine inches in diameter, with a piece of old inch hose nailed across the top for a handle, formed a core around which was wrapped two thicknesses of ordinary sheathing (tarred) paper; this core was then placed in the holes on the boards, and the soil taken out was rammed tightly about it, so as to make the paper solid against it. The block was then removed, leaving the paper in form of a pot. Good soil of turf and rotten manure was then filled into the paper cases, and plants from four-inch pots were set in them. These plants did not require water oftener than three times a week, whereas plants in pots had to be watered often three times a day. In October, when I lifted the plants, they had complete balls of earth about the roots, exactly as if they had been growing in pots all summer. It is an economical and very convenient way of taking care of Chrysanthemums, the cost of the paper being quite nominal.

The Best Varieties.—A good selection can be made from the following list to flower with protection without artificial heat:

Yellow—Gorgeous, Gloriosum, President Hyde, Chevalier Domage, Mr. Bunn, Mrs. F. Clinton, Aureole (Bouch), Dr. Delaux, Sunflower, Rohallion.

White—Mademoiselle Lacroix, Ivory, Lady Selbourne, Elaine, Domination, Avalanche, Blanc Précoce, Bertha Flight, Madame F. Bergman, Shasta.

Bronze—Madame F. de Cariel, William Robinson, M. Edouard André, L'Incomparable, Comte de Germiny, Source d'Or.

Pink—Bouquet Fait, Elenore Bares, Ada Spaulding, Mrs. Hicks Arnold, M. Brunet, M. Boyer, M. Lawson, Excellent, La Triomphante.

Red—George Gordon, M. H. Payne, Dr. Tanner, Bras Rouge.

Purple—John Thorpe, Louis Wielle, M. Bernard.

Where protection is given and artificial heat is available, of course a much larger variety may be selected as flowering from the 5th of November to the 20th. There is in the market a kerosene-oil stove, having about two by one and a half feet of heating surface, which is very cheap, safe to use, and capable of keeping frost out of a structure, say twelve by twenty feet, up to November 15th or 20th.

The following are among the best varieties for such treatment:

Yellow—H. E. Widener, Kioto, G. P. Rawson, E. G. Hill, W. H. Lincoln.

White—Minnie Wanamaker, Eynsford White, M. J. Thomas, Pelican, L. Canning, The Bride.

Pink—I. C. Price, Madame Baco, Alcyon, Miss M. Wheeler, Mrs. A. Blanc, Lilian B. Bird.

Bronze—G. F. Moseman, Carew Underwood, Edward Molyneux, Mrs. Bowen.

Red—Cullingfordii, Mrs. A. Carnegie, Bohemia, Mrs. W. Barr, Mrs. E. W. Clarke.

Early Flowering Plants.

In transplanting plants which bloom early in spring, one should not expect much from them the first year, unless great care is used to take with them plenty of soil, and unless they are moved before they have advanced far in their spring's growth. Even with this extra precaution, there are some that would do better if left until July. Among these are the Dog's-Tooth Violets, Spring Beauties, Wind Flowers, *Dicentra cucularia*, *D. Canadensis*, etc. Such plants almost always do better if left until they have gone to seed. The same can be said of the Trilliums, so far as their first season's growth is concerned; but when Trilliums are set in early spring, they make a better growth the second year than they do the year after they are transplanted in autumn. They usually produce medium-sized foliage and flowers, and thus save their vitality to establish themselves for a vigorous growth the second year. But when the transplanting is left until the leaf-bud begins to show itself above ground, the plant seldom makes a healthy growth, and on account of stunted foliage and broken root-fibers the bulb does not store up full strength for the second year.

In the middle or last of summer, after their stems have died down, there comes a dormant period for many early-blooming bulbous plants. It would seem that during this season would be the most suitable time for transplanting. If the plant is left until after the autumn growth has begun, there is then, in transplanting, a certain loss of vitality to the bulb, which has been used in starting this growth. Many of the fibrous roots are broken, and new ones must be formed. By transplanting during the dormant state, there is little or no loss of strength.

Southwick, Mass. *F. H. Horsford.*

Phajus grandifolius.

Although this noble plant was introduced into our gardens over a century ago, not a single good specimen of it was to be seen at the great exhibitions held in different places in this country during the last few weeks. *Phajus grandifolius* is an evergreen terrestrial Orchid, producing under good culture large, handsome, obovate-lanceolate leaves, two feet and a half long and nearly seven inches wide, and tall scapes seven feet in height, each carrying twenty-five to thirty very fragrant and beautiful flowers. There are usually two scapes from each pseudo-bulb, and often as many as a dozen fully expanded flowers on each at the same time. The sepals and petals are white on the outer surface and a chocolate brown within. The base of the lip, which is folded over the column, is white, stained with yellow on the throat and disk; the sides of the convolute portion flushed with crimson both outside and in.

P. grandifolius blooms during the winter months, and remains in bloom over two months in an ordinary greenhouse temperature. It is also well adapted for decoration, either as a pot plant or cut flower. To obtain large quantities of fine flowers, a liberal treatment is necessary; the plant is of easy culture and will amply repay any amount of attention and care. After flowering it should be kept rather dry and in greenhouse temperature, but never allowed to flag. Early in May the plants should be repotted, divided if necessary, the greater part of the old soil shaken out, and the roots trimmed if necessary. Strong, single growths make nice plants, and two or more may be put into a large pot for a specimen plant. Ample drainage must be allowed, as the plants, during the growing period, require copious supplies of water. Good fibrous loam and rotted manure with a dash of bone flour makes a good compost, and if the loam is inclined to be retentive, a little sand or broken charcoal may be added to keep the soil porous.

A somewhat higher temperature is necessary during growth, about seventy-five to eighty-five degrees, which can generally be maintained during the summer months in a greenhouse. Syringe every day with clean water and shade from direct sunshine. Occasional watering with liquid manure is also beneficial. After growth is completed, considerable reduction of water at the roots and moisture in the air must be made, as an excess at this season will cause blotches in the leaves and decay about the flowers.

Dongan Hills, Staten Island. *W. T.*

Hardy Plants from Seed.—In Mr. Hatfield's notes on this topic he states that nothing is gained by sowing seeds of such vigorous-growing plants as Delphinium under glass, as they rarely bloom the first season. This does not seem to be a happy illustration of what he wishes to say, since all the vigorous-growing Delphiniums will flower the first season. Last week I sowed twelve of the named double and single varieties under glass, and these I certainly expect to bloom the coming summer, and if they had been sown earlier, say in January, there would have been two crops of flowers, such as old-established plants yield, one in June and another later in September. It may be well to notice that there are a few species, principally North American, that require more than one season to be strong enough to flower, but these are not common in cultivation at present, and at best are not nearly as attractive as the older and better-known garden varieties. The following species have always flowered with me the first season: *D. cardinale*, *D. nudicaule*, *D. Cashmerianum*, *D. grandiflorum*, *D. formosum*, *D. exaltatum* and *D. crassifolium*. The beautiful garden forms which are the offspring of *D. formosum*, *D. grandiflorum* and others are the best varieties we have for decoration, and both double and single kinds are easily raised, and come fairly true. The double varieties seed sparingly, but from a few good kinds better varieties can be raised than the imported named varieties. While advocating early sowing

A Country Road-side in New Hampshire.—See page 145.

under glass, it is far from my intention to disparage the sowing under other conditions, but certain it is that these and other plants, even alpines, all pay for being pushed along early in the year. Unless alpine plants are raised early, while we have control of temperature, later in the season we often lose the plants.

South Lancaster, Mass. *E. O. Orpet.*

Pruning Out-door Roses.—As a rule, all Roses in the garden are pruned in spring before the sap starts. The Teas, many of the Bourbons, the Hybrid Noisettes, the Bengal or China Roses, and all others of comparatively weak growth, should be severely cut back; but vigorous kinds, like most of the Hybrid Perpetuals, need only a moderate topping besides the thinning out of the branches. Close pruning of the strong sorts occasions a great growth of wood, but few flowers. Many Roses are more or less injured for blooming every season by a too free use of the knife, notably the various Briers, climbers and native sorts. The Sweet Brier and Austrian Brier are much better when let alone than when closely pruned. There is a beauty in their free growth which is entirely marred by pruning them; and the little increase in the size of their flowers which might result from shortening in the branches does not compensate for the loss of their free growth. The Prairie Rose (*R. setigera*), like all climbing Roses, should be sparingly pruned, and the Dwarf Wild Rose *R. lucida* had better be left untouched.

Germantown, Pa. *J. Meehan.*

More Nematodes.—In a single large greenhouse recently visited, the three following plants, grown in large quantities, were found in a sickly condition: Begonias, Geraniums (Pelargoniums) and Salvias. The Begonia-plants were of considerable size, and some of them had lost a large share of their foliage. The remaining leaves had a wilted but water-soaked appearance, not easy to describe, and quickly fell from their attachments by the slightest touch. There was no sign of a Fungus upon the surface of, or within, the leaf, but upon picking a piece of a diseased leaf apart it was at once found, under the microscope, that countless eel-worms, or nematodes, were present in all parts of the leaf-tissue. It is not a new thing for these microscopic worms to infest the Begonia, but it is rare to find them so abundant and destructive. In a mass of variegated leaved Pelargoniums, perhaps half of the leaves over a considerable area had turned brown and had a disagreeable slimy feel. It was evident that when one such dead leaf had fallen upon a healthy one the disorder was quickly communicated to it. Here again, upon examination, no trace of any Fungi could be found, but, instead, there was an abundance of nematodes. The infested foliage was so transparent, due to the removal of the coloring matter, that by looking through the leaf with the microscope the worms could be seen in all parts of the tissue. The fact that Pelargoniums are subject to attack by nematodes has not been reported heretofore, so far as I know. In the bed of Salvias the leaves were generally blotched, sometimes more than half being dead, but the living and diseased parts were separated by a well-defined line; in other words, the blotches were angular, and in shape governed by the veins of the leaf. The dry brown patches when dissected yielded a full quota of nematodes. The Salvia-leaves, in general appearance, resemble those of the Coleus, noticed some months ago. This justifies us in adding the Salvia to the long list of greenhouse plants that are subject to nematode invasion.

Rutgers College. *Byron D. Halsted.*

The Cultivation of Beans.—The root system of the Bean' while extensive, is but slightly branched, and has but few rootlets. While it is a most persistent and searching collector of moisture and plant-food, gathering a full supply from a soil so poor that the roots of most plants would fail to get anything from it, yet it is comparatively slow in action, and seems unable to meet any sudden extra demand, and to be very sensitive to and slow to recuperate from injury by cold, excess of water, a mutilation from soil-cracking or injudicious cultivation. The entire plant, at every stage of its development from seed to seed again, is peculiarly liable to injury from adverse conditions of moisture and heat. If the seed is planted in earth which is too dry and hot it will malt and fail to grow, even when the soil is afterward made cool and moist. If it is put into ground which is but a little too cold and wet, it will rot; a few hours in a soil saturated with water will kill the roots, or if the plants are subjected for a few days to excessive wet or cold they will be checked beyond possibility of recovery. If the plants, when in bloom or young pod, are wilted by excessive heat and drought, from the injury of the roots by deep cultivation or pulling of long weeds, or because of the sapping of the food and water-supply by the growth of weeds, they will blast and fall off, carrying with them all hope of a profitable crop. As to the best time for planting, no fixed date can be given. It is useless to plant when the ground is in unfavorable condition as to warmth and moisture. Better delay planting until the 20th of July, and then give it up altogether, rather than put in the seed when the soil is too wet, dry, or cold. In general, Beans should be planted just after Corn—that is, just as it is getting a little past the best time for Corn-planting.—*Professor W. W. Tracy, in American Agriculturist.*

Correspondence.

"Insect Lime."

To the Editor of Garden and Forest:

Sir.—Mr. Fernow's recommendation of "Insect Lime" for a variety of our common pests, in addition to the "Gypsy Moth," is perhaps suggestive, and worthy of careful consideration, but it is apt to produce the same misconception as to its range, which long existed, and still exists, as to the effect of tin collars or oil troughs on tree-trunks. The band of "lime" would, undoubtedly, be effective against canker-worms, for here the female is wingless, emerges from an underground pupa, and must climb up the tree-trunk to reach the branches. She cannot pass a sticky band around the trunk, nor any similar obstruction, and if she oviposits below it, neither can the young larvæ. This fact makes the canker-worm an easily controlled pest. It is otherwise with the Fall-web worm, Bag worm and Tussock moth. The female of the web-worm is winged, emerges from a pupa enclosed in a cocoon, flies to the tree, oviposits on a leaf, and the young hatch and feed, intensely ignorant of the dangerous sticky band around the trunk. To be sure the larvæ sometimes wander when full-grown, seeking shelter to pupate; but, if they were stopped from coming down the trunk, they would simply pupate above the band, or the larva would allow itself to drop to the ground from the nearest projecting leaf or branch. In the case of the bag worm it would serve as a protection, where the trees were free from the pest in the first place. Here the female never leaves the bag in which the larva fed, and, after impregnation by the male, becomes an egg-sac purely. These eggs remain secure in the bags during winter, suspended from the twigs of the tree, and in spring they hatch; the young larvæ, already on the tree, and finding it unnecessary to leave it or go anywhere near this "lime." The Tussock moth is as safe, for here too, though the female is wingless, the eggs are laid in fall, quite usually far up on the trunk, or in a folded leaf, which is attached to the twig with silken threads. But, in the case of the last-mentioned species, winds will often cause the larva to drop, or, in its wandering instinct, when full-grown it drops voluntarily, and then a "lime" band would be effective. Still, it is only a very partial remedy, and does not begin to compare in effectiveness with winter collecting and destruction of egg masses, as recommended by me in a recent number of Garden and Forest. Concerning the "Gypsy Moth" I have nothing to say, since I have had no personal experience with it.

Rutger's College. *John B. Smith.*

The Western Arbor-vitæ.

To the Editor of Garden and Forest:

Sir.—I was much interested in reading the article on "The Western Arbor-vitæ" in the Garden and Forest for March 11th, 1891, but was surprised to see the statement, on page 109, "*Thuya gigantea*, unfortunately, is not hardy in the eastern states, and, like many of the trees of the Pacific forests, it cannot be used to beautify and enrich our plantations," since I know of at least three very fine specimens which are in excellent condition, and appear to be perfectly at home. One is in my own grounds at Morrisville, Pennsylvania—a tree about thirty years old, thirty feet high, and one foot in diameter of trunk at three feet from ground. Another tree, nearly as large, stands in the grounds of William Parry, at Parry, New Jersey. There is also a fine specimen in Central Park, New York City, of several years' growth, but I cannot give its dimensions.

While all three of these specimens occupy positions where they are slightly protected from heavy winds by other trees of large size, they do not show any symptoms of weakness or

tenderness, but are growing very rapidly, and making handsome, symmetrical trees.

I think it is a tree entitled to a conspicuous place in any good collection of large evergreens.

It can be propagated by cuttings, although not as readily as some of the other Thuyas; also by grafting on *Thuya occidentalis*.

If grafted, it should be worked low and planted deep, so as to get the tree eventually on its own roots.

Morrisville, Pa. *Samuel C. Moon.*

[It is interesting to know that this fine tree exists in the eastern states, and that it can be grown here in sheltered positions. It must be remembered, however, that a few isolated specimens, a few years old only, do not furnish satisfactory evidence that an exotic tree is capable of adapting itself permanently to new surroundings and of growing to a large size and to old age. There are two or three stunted specimens of the Big Tree of California in Central Park, and there are several larger specimens of the same tree in the city of Rochester, in this state; it would be very unwise, however, to plant the Sequoia anywhere at the east, except as a curiosity, on the strength of these specimens. Several of the Pacific coast conifers grow very well in the east for a number of years, especially if they can be placed in sheltered situations. None of them, however, are very reliable, and are more than liable to succumb to a succession of severe winters. Exceptions are the Weeping *Pinus ponderosa*, at Fishkill in this state, of which a portrait appears in our issue for October 10th, 1888; the fine plant of the Sierra Nevada White Fir (*Abies concolor* or *Lowiana* or *Parsonsiana*, as it is sometimes called in gardens), at Flushing, on Long Island, and a few plants of the Lawson's and the Sitka Cypresses in the neighborhood of Philadelphia. None of these trees are either very old or very large, and their survival through twenty or thirty winters does not prove the value of these species for general planting in the east. Correspondents in the eastern states will do us and our readers a favor by calling attention to other instances of Pacific-coast conifers proving hardy here.—Ed.]

The Owl and the Sparrow.

To the Editor of Garden and Forest:

Sir.—If, as Mr. Naudin has suggested, our little European owl is introduced into the United States for the purpose of destroying the sparrow, the fact should be borne in mind that there are two of these animals, constituting either distinct species or different races. It is only the representative of these nocturnal birds which inhabits the south of Europe which has established itself in the neighborhood of dwellings to the extent even of building his nest under the eaves of houses. It is this southern bird that modern ornithology designates under the name of *Athene meridionalis*, and has identified with the owl which accompanied Minerva in her visit to the ancient Greeks. In the central and north of Europe we have in place of this bird the true *Stryx passerina* of Linnaeus, a rather stronger bird, and very different in its habits. This northern bird does not inhabit cities nor villages or the neighborhood of human habitations. It is much less numerous than its southern relative, and selects for its home wild and uninhabited regions, the borders of forests, uncultivated slopes, and mountains covered with trees. The logic of events, therefore, removes it decidedly from the domestic sparrow, leaving it to prey upon, if it desires to vary its ordinary diet of mice, the field sparrow, an inoffensive species of which no complaint is made in America.

If the attempt to acclimatize the chevêche in America is made, it will be necessary to procure it from Italy, where it is known under the name of "civetta," or from the south of France, and not from England or from Germany where the chevêche is called "steinkauz." And here another question presents itself, Can this bird of southern Europe support the climate of Massachusetts or even that of New York, accustomed as he is to the mild winters of the Mediterranean countries?

Your correspondent, N. H. C., appears to me to be right. Will the chevêche, once established as an American citizen, show sufficient intelligence to devote its energies to the extermination of the sparrow and leave the native birds alone, and then, when he has exterminated the imported sparrows, what is he going to live on? Videant consules ne quid detrimenti res publica capiat.

Berlin. *C. Bolle.*

To the Editor of Garden and Forest:

Dear Sir.—My little owl does not appear to have had much success with the readers of Garden and Forest. Their fears with regard to it, however, seem to me exaggerated. This little bird is too feeble to attack poultry, and its specialty in the order of nature is to wage war on sparrows and mice, which it pursues into their holes. The truth is, that in Europe, where this bird is found, the damage done by sparrows is greatly reduced; and that this owl does less damage to ordinary birds than cats, which could often be dispensed with to advantage, as they inflict serious injury on birds, to say nothing of the fact that they sometimes go mad and are then very dangerous.

Antibes, France. *C. Naudin.*

Viola ocellata.

To the Editor of Garden and Forest:

Sir.—In your issue of February 4th appears a cut of *Viola ocellata*, which bears so close a resemblance to a species found here on the south side of a spur of the Blue Ridge that I am inclined to believe it the same. The cut is good, so far as it goes, but the variety here grows in dense clumps, often twelve inches in diameter by eight inches to a foot in height, covered with hundreds of exquisitely beautiful, cream-white flowers. The perfume is almost imperceptible, but a faint odor is exhaled which a keen scent can detect. Several years ago, being in these mountains, I collected a few plants, brought them home and planted on the east side of my flower-garden, since which time I am forced to destroy them by the hundred every year to prevent their taking entire possession of the ground. My plants bear flowers with long stems, many of them eight inches long, and this renders them valuable for cut flowers. We often mix them with the fragrant *Viola odorata*, and so delude the possessor with the belief that both varieties are odorous. The plants make a beautiful border, and, being evergreen, never lose their attractiveness altogether. The flower has a pale, delicate lavender splash on its three lower petals.

Spartanburg, S. C. *J. S. R. Thomson.*

[*Viola ocellata* is confined to the Pacific side of the continent, and it can hardly be the plant referred to by our correspondent. This, judged by the young plants, not yet in flower, with which she has favoured us, is probably one of the white-flowered varieties of the European Violet (*V. odorata*) which has become naturalized, and is now widespread in some parts of the south Atlantic states.—Ed.]

Notes from Milton, Massachusetts.

To the Editor of Garden and Forest:

Sir.—Although extraordinary care is often given to the propagation of tropical plants they may be successfully rooted on a common gravel bed, such as is used for staging plants. During a recent visit to the greenhouses of N. P. Kidder, Esq., Milton, Massachusetts, I observed that the gardener there, Mr. Martin, roots almost everything in this way. Mounds of gravel are pulled together containing a little grit and also some clay, just sufficient to hold the material together and retain moisture. At the time of my visit such plants as Crotons, Dracænas and Pandanus were being rooted, and many others were shown me which had been propagated in the same way. The cuttings are shaded by plants, and all the water they get comes from syringing.

I have before referred to the value of deep pits with glass roofs about level with the ground. Further evidence of their great usefulness was given here. All kinds of plants may be stored in them which will endure a night temperature of about forty-five. They are mostly used for Cinerarias, Calceolarias, Ericas, Azaleas, Camellias, Cytisus, and also for the later batches of Holland bulbs.

The white *Epacris palludosa* is here grown well. This is probably the best variety for cutting. It is often supposed that imported peat is necessary to grow these well, but Mr. Martin's plants are grown in leaf soil and loam only. His later treatment consists in cutting back severely; abundance of water during the growing season, and a shady place during the

hottest weather; more exposure to sun-heat is given toward fall, in order to get the flowering shoots well ripened.

Mr. Kidder's well-known specimen of *Cypripedium insigne* is a grand sight when furnished with about 100 blooms. It has been exhibited in Horticultural Hall, in Boston, with 110 blooms. It is planted in the form of a semi-globe, measuring four feet six inches over its semi-circumference, and is very even in growth. *C. villosum* is represented here by a fine specimen in a twelve-inch pan, carrying thirty flowers. This is a robust and very satisfactory species to grow; very handsome and distinct, and a peculiar waxy lustre pervades the whole flower. This, with *C. barbatum*, has been the parent of many handsome hybrids.

C. callosum, a recent introduction, very much resembled a fine specimen of *C. barbatum Warneri*, flowering near by. On comparison the latter seems the handsomer—the dorsal sepal is larger, the violet striping is lighter, and a still further distinctive feature is a rainbow band of mauve separating the green from the white portion of the sepal.

C. hirsutissimum, apart from the growth of short hairs, which covers the flower as well as other parts of the plant, shows no striking peculiarity either in form or in coloring. Both the dorsal sepal and pouch are a dull reddish brown, the petals being the most conspicuous part of the flower. They are long, measuring in this case over five inches across, wavy at the base, with a band of mauve running longitudinally.

Wellesley. *H. G.*

Recent Publications.

Les Plantes Potagères; Description et Culture des Principaux Legumes des Climats Tempérés, par Vilmorin-Andrieux et Cie. Deuxieme edition. Paris, 1891, pp. 1–730.

French horticulture is supreme certainly in the vegetable garden; and vegetables are better grown and better marketed in France than elsewhere, and better cooked, we can say in passing without fear of contradiction; and the reader, therefore, anxious to inform himself of all that is new in the way of garden vegetables and their cultivation, and of the salad plants, of which the French make so much account and the rest of the world make so little, will naturally turn for information to the writings of French horticulturists on the subject. The work whose title is printed above and which has just been reissued in a new and considerably enlarged edition will first attract his attention, for although it bears on the title-page as author the name of the commercial firm which for a hundred and fifty years has been prominent in European horticulture, it is really from the pen of the senior member of this firm, the President of the Botanical Society of France, the Secretary of the French Agricultural Society and a recognized authority on the subject of which this volume treats.

It is only eight years since the first edition of this work was published, but so great have been the additions to the number of varieties of useful vegetables which have appeared lately that a second edition became necessary if the work was to retain its value as a manual of the subject. Frequent and rapid modifications are inevitable in the case of a work treating of cultivated plants, especially leguminous plants which, as they appear in the vegetable garden, are mostly annuals or biennials—that is, plants in which generations succeed each other rapidly, displaying new characters which often become fixed into new varieties. There is hardly a year, therefore, perhaps hardly a day, in which some new vegetable form does not appear in the gardens of the world, forms which are often susceptible of being made permanent, and sometimes worthy of being preserved. The reproach is often laid at the door of horticulturists in general, and of seedsmen in particular, that they insert in their catalogues too large a number of varieties of the same plant. It should be remembered, however, when this reproach is made, that horticulture to-day is incomparably more specialized than it was twenty years ago. Even then there were excellent reasons in favor of the multiplication of races, the special tools provided for different horticultural operations. Such reasons are much stronger to-day than they were at that time. Besides the differences of form, of color and of taste which often make the special value of a race of vegetables, their variation with regard to more or less abundant production, to earliness or lateness in maturing, and to the greater or longer time any crop can be prolonged, offer economic questions which must have a great influence in deciding favorably or otherwise the claims of each particular race of such plants. It will be acknowledged, of course, that it is a matter of capital importance for a market gardener to sell his crop of any given vegetable at the exact time when the price is the most advantageous for him. This makes it desirable to develop and fix races having the power to mature early and to mature the whole crop simultaneously, thus leaving the ground free for a succeeding crop of another character. This is demanded in modern market-garden practice, which must allow products to be sent for a long distance to the centres of consumption, thus placing in competition various climates and leaving to each a short time in which to perfect under the best conditions its special products.

It is interesting to note that a large number of recent additions to the list of vegetables cultivated in France have been obtained from North America, especially potatoes, beans, corn, squashes and tomatoes. These last, which, twenty years ago, were practically unknown to the French public in general, have now become one of the most popular vegetables in France, and are sold in the streets of the principal cities every autumn, in immense quantities and of excellent quality.

Monsieur Vilmorin finds that "the Americans bring to their horticultural operations the alert and practical spirit which characterizes all their enterprises, and apply themselves at once to create, in each centre of production, the races best adapted for the end they have in view, and for local conditions."

A word as to the form in which this work is cast will, perhaps, best indicate its scope and value. It includes plants which are usually cultivated in the temperate parts of the world, to be eaten in a fresh state, and also those which serve as seasoning, and includes a good many which have now disappeared from the vegetable garden, but which are mentioned as vegetables in some of the old books of horticulture. It should be mentioned, perhaps, that some plants which are not considered vegetables in this country, such as Strawberries and Melons, find their place here also. Each article devoted to one or several allied plants, cultivated as vegetables, begins with the botanical name applicable to all the plants grouped together in the article; that is, the name which designates the genus and species to which all the forms, more or less modified by cultivation, can be referred. The races of peas, for example, however numerous they may be, appear under the general name of *Pisum sativum*, Linnæus. All the races of beets under the general name of *Beta vulgaris*, Linnæus, etc. In this connection Monsieur Vilmorin remarks that "the fixity of the species, whatever its absolute value may be considered in the system of creation, is very remarkable and worthy of admiration, regarded only from the point of view of the period through which human investigations extend. Species cultivated since the earliest historic times, and exposed to all the modifying influences which might be expected to follow in the case of plants raised, generation after generation, from seed, in spite of their removal from one country to another, and the alteration in the character of their surroundings, preserve their distinct existence, and, although assuming continually new forms, never pass the limits which separate them from allied species."

After the generic name the vernacular names appear under which the plant or group of plants is known in France and in England, Germany, Spain and Italy, and, sometimes, also in Portugal and Holland. This is followed by a short historical account of the plant and the name of its native country, etc., as far as it is known; then the character of the plant, that is, whether it is annual, biennial, or perennial. This is followed by a description of the species, directions for its cultivation in the climate of Paris, and the manner in which it is used. After this comes a more detailed description of each variety with its synonyms, each variety being illustrated by a small woodcut in the text. As an example, the Egg-plant may be taken. This appears as Aubergine, the *Solanum Melongena*, Linnæus, or *Solanum esculentum* of Dunal, of the family of the *Solanaceæ*. Fifteen French synonyms for Aubergine are given, arranged alphabetically in a paragraph by themselves. This is followed by another paragraph, giving the English, German, Dutch, Italian, Spanish and Portuguese names. After them appears the word "annuelle," showing that the plant is an annual, the remainder of the paragraph being devoted to a description of the wild type, followed by the statement that there are 250 seeds in a gramme, weighing 500 grammes to the litre, and that the germinating power of the seed will last for six or seven years. The next paragraph is devoted to instruction upon the cultivation of the Egg-plant, and this is followed by a paragraph upon the uses of the fruit, all this making an introduction to the account of the ten varieties which are considered the most valuable. A similar plan is followed throughout the work in the case of each group of vegetables, which are arranged alphabetically under the French names.

Some idea of the completeness and value of this book as a work of reference will appear when it is stated that in the case of Lettuce (*Lactuca sativa*) more than a hundred varieties are described, while peas, tomatoes, and some other popular vegetables are treated still more fully. It must be remembered, too, in considering the merits of this work, that it is not a compilation, and that the estimation of the value and the knowledge of the characters of the different plants described is based on information obtained in long series of experiments carried on by the author and his assistants for years, and conducted in the spirit, and with the appliances, of strictly scientific investigation. When the amount of work, of which this volume is the record, is considered, it is not hard to understand why the French have made such progress in the improvement of races of vegetable-plants, or why they stand at the head in such matters. The value of the book is increased by tables, in which are given the number of seeds of the different vegetables described, in a given weight, and the average and extreme period during which they retain their germinating power, derived from actual experiments; and also a very full index in which, besides the French and Latin names, those of the other modern languages appear as well as all synonyms.

Notes.

An enterprising dry-goods firm in Philadelphia paid some $500 for decorating their store for the spring opening in the early part of last week. Just before Easter they began to sell the plants to their customers for Easter presents. The result was, that they not only had their decoration for nothing, but realized a handsome profit on it.

The prices of oranges in southern California have nearly doubled, owing to the report that the crop has failed in Italy. Three-fourths of the California crop has been sold on the trees for prices higher than those which have been realized for many years, and the fruit is so abundant that the railroad companies are pressed for facilities to handle it.

A recent bulletin, by Professor Beal, of the Michigan Agricultural College, contains a few of the seeds of six of the worst weeds in that State, so that farmers will be the better able to identify them in examining their clover and grass seeds. The six plants which are credited with this bad eminence in Michigan are Canada Thistle, Red Root, Moth Mullein, Toad Flax, Rib Grass and Narrow Dock.

The Yosemite National Park now embraces parts of forty-two townships, covering about 1,500 square miles, or 960,000 acres, from which is to be deducted the Yosemite grant of 36,000 acres. About 700,000 acres of the National Park is mountainous, well watered, and heavily timbered with Pine, Fir, Spruce, Hemlock, Tamarack, Oak, Cedar, Madroña, Laurel, Sequoia, and Mountain Mahogany. Two hundred and sixty thousand acres are composed of mountain-valleys, meadows, lakes, etc.

The very first entry in the first book of the Plymouth Colony Records is an incomplete list of the "Meersteads and Garden-Plotes of those which came first, layed out 1620." The persons here referred to are, of course, the famous band who were brought by the Mayflower on her first voyage. They had been grouped in nineteen families, and the houses to which these "Garden-Plotes" were attached were built along both sides of what is now Leyden Street in Plymouth. "Meerstead," usually spelt "Merestead," is an old word for farm.

We have received, from a correspondent in Santa Barbara, a spray of the Black Wattle (*Acacia decurrens*), and, in spite of their long journey, the flowers are still bright and beautiful. The trees are very floriferous, and the long racemes of clear, yellow flowers, hanging among the pale green and finely cut foliage, present a very beautiful appearance. The tree is graceful and symmetrical, and it is now attracting great attention in California on account of its economical value. Its bark is so rich in tannin that it is now being planted in Australia and New Zealand by the thousand acres.

In a recent issue of the *Botanischen Centralblatt* it is stated that Dr. Dieck, the well-known dendrologist of Zoeschen, Germany, brought home some very interesting plants from those districts of Pontus and Western Caucasus which he visited last summer. Among them are living specimens of about seventy varieties of Roses, and specimens of *Acer Trautvetteri*, of *Rhododendron Ungeri* and *R. Smirnovi*, of the remarkable Chestnut-oak of Koch (*Quercus Pontica*), and of the genus Orphanidesia, belonging to the *Ericaceæ*, which had never been collected since it was first discovered by Balansas. Most of those plants, it is announced, Dr. Dieck will be prepared to distribute during the coming spring.

A Bulletin, recently issued by Professor E. W. Hilgard, contains brief descriptions of the Port and Sherry Grapes which are now known to be growing in California. Of the Port wine varieties six are named, and of the Sherry and Madeira varieties nine are described. An essential advantage possessed by these grapes over those of the Claret and Bordeaux types is, that they resist, to an extraordinary degree, the influences under which wines made from grapes of the latter types become vinegar. Instead of this they undergo, under the continued action of warm air, the change to the true Sherry and Port flavors.

One would hardly expect from Edgar Allan Poe a panegyric on the art of gardening, yet who has written more sympathetically of the art than he in this passage from the *Domain of Arnheim?* "No definition," it runs, "has spoken of the landscape-gardener as of the poet; yet it seemed to my friend that the creation of the landscape-garden offered to the proper muse the most magnificent of opportunities. Here, indeed, was the fairest field for the display of imagination in the endless combining of forms of novel beauty, the elements to enter into combination being, by a vast superiority, the most glorious which the earth could afford. In the multiform and multicolor of the flowers and the trees he recognized the most direct and energetic efforts of Nature at physical loveliness. And in the direction or concentration of this effort—or, more properly, in its adaptation to the eyes which were to behold it on earth—he perceived that he should be employing the best means, laboring to the greatest advantage, in the fulfillment not only of his own destiny as a poet, but of the august purposes for which the Deity had implanted the poetic sentiment in man."

The industry known as "truck-farming" has been made, for the first time, the subject of the census investigation, and a preliminary report, prepared by Mr. J. H. Hale, has been received at this office. Truck-farming, as considered in this bulletin, is distinguished from market-gardening by the fact that it is carried on, in favored localities, at such a distance from market that transportation by water or by rail is required. Market-gardening proper is confined to local markets, where the grower uses his own team for transporting his products to the retailer or the consumer. Truck-farming, as a business, is largely the creature of the transportation companies, and it has grown up almost entirely since the year 1860. During the census year it required the labor of 216,765 men, 9,254 women and 14,874 children, aided by 75,866 horses and mules, working $9,000,000 worth of implements upon 534,440 acres of land, valued at $70,156,300; and the total production, after paying freight and commission, amounted to $76,517,155. The total acreage of some of the leading vegetables grown on truck-farms is as follows: Asparagus, 37,970; Cabbage, 77,000; Spinach, 20,000; Celery, 15,000; Water Melons, 114,000; Peas, 56,000; Sweet Potatoes, 28,000; Tomatoes, 22,000; miscellaneous vegetables, 82,000.

From correspondents in several of the principal cities we learn that the volume of the Easter flower trade throughout the country has been larger than usual and that prices have been fair in spite of unfavorable weather in many places. The practice of making presents of growing plants has increased so of late years in many cities, notably in Boston and Philadelphia, that florists have been compelled to open temporary stores in addition to their regular places of business to accommodate the increased trade. Some of these retail dealers have disposed of as many as a thousand pots of Easter Lilies, not to speak of a great variety of other plants in bloom. There are few changes in the list of flowers grown and sold for this festival. The larger and coarser *Lilium Harrisii* seems to have quite crowded the old Ascension Lily, and it undoubtedly will continue to hold its place as an early-flowering plant, although there is an increased demand reported for *Lilium longiflorum* in some places. In this city the only thing in the way of novelty among Easter plants observed was Garden Anemones. Large pots of these plants in bloom are very beautiful, and they are practically new to the flower-buying public here. In the decorations of churches and other large places it is gratifying to see *Acacia pubescens* used more largely, as its delicate inflorescence helps to relieve arrangements which otherwise would appear heavy. Few Palms, beside the ordinary trade varieties, were noticed in Easter decorations, but an increased use of Araucarias was very apparent.

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A Botanic Garden for New York.

THE educational equipment of a modern city of metropolitan pretensions, as has been pointed out more than once in these columns, cannot be considered complete without a public garden, administered by a man of science in a scientific spirit, as a station of scientific investigation and public instruction. These views have gained a foot-hold in the community, and there is, at this writing, every prospect that the bill "to provide for the establishment of a Botanic Garden, a Museum and Arboretum in Bronx Park" will be enacted by the present legislature, it having been passed successfully through all the preliminary steps. By this bill the park commissioners of the city of New York are directed to set aside 250 acres for a private association which asks to be incorporated to carry on the garden. The purpose of the association is to establish and maintain a Botanic Garden, Museum and Arboretum for the collection and cultivation of plants, flowers, shrubs and trees; for the advancement of botanical science and knowledge, the prosecution of original researches in botany and kindred subjects, for affording instruction in these subjects, and for the exhibition of ornamental and decorative horticulture and gardening; for the entertainment, recreation and instruction of the people. In the list of the incorporators appear the names of some of the most intelligent and public-spirited, and some of the wealthiest men in this city; and it is safe to say that, if they are thoroughly in earnest in their desire to bestow upon the city a great botanical establishment, and if they realize what such an establishment should be, there need be no serious anxiety for its future.

The site selected for the proposed garden is an excellent one; the territory it provides is ample, its surface is pleasantly varied, and its situation has the advantage of being near enough to the centre of population to be readily accessible, and, at the same time, sufficiently remote to be beyond the injurious influences of the vitiated atmosphere of the city. The corporation is to raise the sum of $250,000, with which to establish the garden, and when it has done this the park commissioners of the city are to expend a sum, upon which the income is $15,000, in preparing museums, herbarium buildings, lecture halls and structures for the cultivation of exotic plants, and to construct and maintain the drives through the garden and arboretum, and provide for their policing.

The sum which the city is asked to expend on buildings seems ample for many years at least, but if the general excellence of the plan is to be criticised at all it is in the meagre amount which the new corporation is expected to expend. The city is to build and maintain roads and to spend $400,000 or $500,000 in providing buildings, but when this is done the corporation will hardly be in a position, with an income of only $10,000, to carry on and gradually develop a great herbarium, library and museum, to plant an arboretum, to stock greenhouses with representatives of the tropical flora of the world, to establish gardens of hardy perennial and annual plants, to keep up rock-gardens and shrubberies, water-gardens and bog-gardens, and all the other departments of a modern botanical establishment.

A botanical garden is a museum, and, like all museums, its value depends on the capacity of the man who controls it; it is useful or inefficient in proportion as its head understands the true aim of a museum and has the patience and executive force to carry out his ideas. The man who is equipped to organize a garden in this city which is eventually to occupy an area of 250 acres, and is to place it in such a position among the scientific establishments of the world that its claims and importance will be recognized, is not easy to find; and he will be able to command a salary which will make a large hole in the income of the fund of $250,000. The gradual building up of a herbarium and library, the heart and brain of every scientific garden, and their administration will consume the rest, so that unless a much larger sum of money is provided than the promoters of this scheme now seem to have in mind, there is great danger that the garden will languish, and that those persons now most interested in it will become discouraged. We say this not to add in any way to their discouragement, but only to emphasize what we have said before—that the establishment of a great botanical garden is a serious and difficult undertaking. A garden of this sort is one of the most complicated things a man can be called on to manage; it costs a great deal of money, its growth must be slow, and those who plan such an establishment and labor for it in its inception cannot hope to gather the fruits of their labor. Art is long and the span of human life is short. But it is one of the most hopeful signs of our civilization that men occasionally appear who are really unselfish and are willing to work for the public good without hope of great reward and without expectation of seeing their labors bear fruit in immediate tangible results. The man who lays the foundation of the great garden which is now contemplated, and which we believe our children will live to see firmly established in the Bronx Park, will be a man of this character. It was such a man who came to Kew Gardens just fifty years ago; and since it is by Kew that the promoters of botanical establishments are accustomed to measure their ambition, it will be useful to explain in a few words what Kew is and why it has become what it is.

Fifty years ago the British Government, principally at the solicitation of the then Duke of Bedford, a man famous in his time for his enlightened enthusiasm in gardening which made Woburn Abbey one of the great gardens of England, determined to convert the old gardens and pleasure-grounds surrounding the royal palace at Kew into a public botanical establishment. Sir William Hooker was invited from Glasgow to manage it. He brought with him a European reputation as a botanist, unflagging zeal, industry and enthusiasm, a fund of sound Scotch common sense, the friendship and confidence of all naturalists, and the largest botanical library and herbarium which had at

that time been made. These last he presented to the nation; his reputation and the importance of his collections at once attracted botanists to Kew from all parts of the world. Their visits benefited the establishment, and plants, specimens and books poured into it from all sides. The scientific character of Kew was thus established, and it is this high character that has given it the lead it has long held among the gardens of the world. Sir William Hooker gave the remainder of his long life to Kew, and devoted all his energies and resources to its welfare. His son, a man more famous than the father, succeeded him, and under his administration Kew gained wonderfully in every direction, especially in popular favor. The second Hooker retired from Kew a few years ago full of honors, handing down the administration of the garden and all the family traditions to a connection by marriage, under whose wise and broad management it is growing now still more rapidly than ever before in usefulness and beauty. In no other spot in the world can so many different plants be seen growing; the museums of economic botany are unequaled, the herbarium is the most extensive that men have ever made, and the library is unsurpassed. This is the work of fifty years, carried on by men of extraordinary ability and world-wide reputation, working under the most exceptionally favorable circumstances and with the whole British nation behind them. Kew has received many gifts of great value, and is receiving such gifts every week. It costs, however, to carry on the establishment, which, by the way, does not cover much more than half the area to be occupied by the New York garden, $75,000 or $80,000 a year. The cost of all sorts of garden labor in England is not more than half what is paid for such labor in this country, and everything connected with a garden costs less there than it does here. If, then, Kew furnishes the ideal at which the promoters or the projectors of the new garden aim, they must realize that this can be reached only by the expenditure of a great deal of money, and that even with all money needed such results as the people of New York have the right to expect can only be brought about slowly and with the aid of unusually favorable conditions. Something can be accomplished with $250,000, but this amount is only a beginning, if New York expects to rival London, or St. Louis, or Boston in its Botanic Garden.

Pruning Shrubs.

OUR climate is so favorable to the growth of deciduous, flowering shrubs that they are steadily growing in use and favor in American gardens. The time will come when we shall learn to give them good deep soil, and allow them enough space to develop into their best form. The time will come, too, when they will suffer less serious mutilation at the hands of unskillful laborers who feel called upon to "trim them into shape" every spring. Directions for proper pruning have often been given in horticultural journals, and although the principles which underlie correct practice have been set forth so plainly that no one need err, the necessity of repeating these instructions again and again is apparent to all who take note of the cruel treatment to which many shrubs are subjected.

In the first place, it should never be forgotten that pruning is a weakening process. It takes away from the plant a portion of its vital machinery, and when the cutting is severe the loss of vigor is serious. As an example of this, florists are learning that the present demand for long-stemmed Roses is a tax upon the vitality of the plant, and they have found that they are selling not only flowers but the life of their plants, and after one crop has been taken the bush needs a long rest to recuperate its exhausted energies. Last summer the luxuriant foliage upon some White Maples in a city street was pointed to as a proof that pruning added vigor to the trees. During the previous winter it is true that the limbs had been sawed off nearly to the trunk; but the mass of leaves on the slim twigs which had put out in great numbers from every adventitious bud on the stumps of the amputated limbs was only a proof that nature was making this extra effort to supply the nutritive organs of which the tree had been robbed. This spasmodic output of leaves was not a sign of health, but a signal of distress. Of course, pruning is necessary for many purposes. The removal of dying limbs is remedial. It may be of more importance to increase the fruitfulness of a vine or tree than to promote its longevity, or it may be necessary to change the form of a shrub or tree in order to adapt it to its position and surroundings.

The usual reason offered for the severe pruning of shrubs is that it makes them more floriferous; but the work is often done at such a time and in such a way that it destroys all hope of flowers for the year. A little examination will teach a novice that the shrubs which are to bloom early this spring made all their preparations for it last year. The flower-buds were formed on the wood which ripened last summer, and they were nicely covered up to protect them during the winter. This can readily be proved by cutting off some twigs from a Peach-tree or Thunberg's Spiræa and placing them in water in a jar which is kept in the sunlight in any ordinary living-room. In a short time the buds will open and the flowers will appear, and the experiment could have been successfully made at any time during the winter. Now, when these limbs are cut back severely at this season of the year all the flower-buds are cut away, and we need expect no flowers this year. If we wait until after these early-flowering shrubs like the Forsythias are through blooming, and then cut back the wood which has borne the flowers, new branches will be thrown out to make up for the part which has been taken away. These branches will ripen up during the summer and form flower-buds for blooming next spring. Hence, the first rule to be observed in pruning early-blooming shrubs for the sake of their flowers is: Cut back the growth in late spring or early summer as soon as the flowers have fallen, and never do this pruning in autumn, winter or early spring.

On the other hand, there are shrubs like the Altheas and the Hydrangeas which bloom late in the season, and in these the flower-buds are formed on the wood which grows the same summer. It follows that if these were pruned in early summer the effect of destroying the flowers would be almost as bad as winter pruning would be in the case of the early-flowering shrubs. But if the last year's growth is now cut away before any of the new wood starts the plant will put forth more shoots which will bear flowers in autumn. In the case of such shrubs, therefore, the pruning should also be done after the flowering season—that is, in late autumn, or better in the early spring.

These rules are very general, and they do not cover all cases, as, for example, there are some early-flowering shrubs which do not make their flower-buds on the shoots which were made last year, but on short spurs from the older wood. It may be also said that pruning for flowers alone is not altogether judicious, for shrubs are in bloom but a few days or weeks at the most, and a good gardener will give heed to their general appearance throughout the year. For this reason it is good practice to encourage the shrubs to develop into their best natural form, and this is not done by cutting them back with the simple view to increase their flowers. The proper course is to thin out the feebler and overshadowed branches, so as to give the stronger ones a better chance to develop, and to cut back cautiously, so as not to interfere with their natural and most beautiful form. They will then give pleasure all the year through, not only when in flower and when in full foliage, but even in the leafless season; for shrubs have a distinct and peculiar beauty in the winter, not only from the graceful outline of their spray, but from the delicate color which comes from the mingling of the varied tints of the bark on the branches—a color which seems to rest upon and float about them like a nimbus or halo. All this beauty at every season can be marred by careless shearing, or, what is still worse, by a painstaking effort to cut the shrubs into formal shapes. There is never any justification for clipping them into geometrical forms, like cones or cylinders or spheres; nor for shaving off their tops at the same level as if they were parts of a hedge fence. This means the destruction not only of the beauty, but of the health of the plant.

The one pleasure which is common, constant and universal to all parks results from the feeling of relief, experienced by those who enter them, on escaping from the cramped, confined and controlling circumstances of the streets of a town; in other words, a sense of enlarged freedom is to all at all times the most certain and valuable gratification afforded by a park. The scenery which favors this gratification is therefore more desirable to be secured than any other, and the various topographical conditions of a site, thus, in reality, become important very much in the proportion by which they give the means of increasing the impression of undefined limit.—*Olmsted and Vaux, in Report of Brooklyn Park Department, 1866.*

The Colonnade in the Parc Monceau, Paris.

THE Parc Monceau has already been described in GARDEN AND FOREST,* so it is needless again to tell how it originated, or to note the general characteristics which, despite the introduction, in inappropriate situations, of an excessive multitude of bedding-plants, make it the prettiest of Parisian pleasure-grounds. We now desire simply to call attention to the picture on page 163, which shows a portion of a long, curving colonnade, shaded by trees and luxuriantly draped in Ivy, that stands on the edge of an oval basin of water. It is the most charming and individual feature of the park, and seems especially interesting when we find that it was not built in willful imitation of a ruin, but is a veritable relic of former days. It dates from the best period of the early Renaissance, though, singularly enough, its exact origin is not known. According to one tradition, it was brought from the destroyed Château de Raincy; according to another, which is more generally held, it was part of a great rotunda which Catherine de Medici commenced to build, north of the Church of St. Denis, to receive her own mausoleum and that of her husband, Henri II., and which was torn down in the beginning of the eighteenth century. In his book on "Paris in Old and Present Times," Mr. Philip Gilbert Hamerton writes: "Nothing can be more elegant than this colonnade. . . . In its present situation it seems like a remnant of antique architecture in some graceful picture by Claude, and one is grateful for the good sense that has saved it from destruction. Lalanne once made a very poetical charcoal drawing of it, which has been reproduced in the series of his charcoals. This is one example . . . of the happy combination of architecture with foliage and water. Set up in the British Museum these columns would signify comparatively little; but with graceful foliage and a mirror of water they are charming."

Some of the beautifully proportioned columns, with their delicate flutings and rich Corinthian capitals, can be more plainly seen than those which our picture presents; yet it would be hard to find more charming objects than these. No plant is more classic in its effect or in its historical associations than the Ivy, and it adapts itself as well to the stately simplicity of a piece of classic work like this as to the broad simple rugged masses of a Norman castle-wall or to the slender arches and elaborate carvings of a ruined Gothic abbey. It is a misfortune that, in the dry climate of our northern states, Ivy does not grow so well as it does even in the northern parts of Europe. But in sheltered situations, and especially in southern localities, it well repays the gardener's care. It is not so free and spreading in habit as the Virginia Creeper, yet it does not, like the so-called Japanese Ivy, cling so tightly to its supports that it becomes a close-fitting garment rather than a drapery; and over both of these it has the advantage of keeping its beautiful dark green foliage throughout the winter. Moreover, it grows as well when trailing on the ground as when climbing a wall or column, and this peculiarity is very useful when the gardener is trying, as so often is desirable, to connect an architectural feature integrally with its natural surroundings. Beautiful borders of Ivy are constant features in European pleasure-grounds, and our picture shows how such a border can serve the artistic purpose just referred to while forming a delightful object in itself. When trees instead of columns are draped with Ivy, and it is then allowed to run out over the grass, whether in a formal or a naturally luxuriant way, the effect is equally charming.

We would also call attention to the fine effect of the statue on the little island which occupies the centre of the basin. Had it been stood in a commonplace fashion in the middle of the island, it would have been much less impressive than it now is, reflected with its massive pedestal in the silent water, supported by the tree-trunks just beyond it, and backed by the low mass of shrubs. There is no one point where we have more to learn from the French than with regard to the placing of statues in the open air.

Winter Studies of the Pine Barren Flora of Lake Michigan.—I.

IT is the common practice of those who study plants in their native wilds to observe them mainly during their season of growth. A stroll in the woods in winter, or a botanical excursion when the ground is covered with snow, seems out of place and without adequate reward. But the trees and shrubs in winter, the mosses and lichens which cling to their trunks and limbs or grow beneath their shelter, and the humbler plants with evergreen or persistent leaves offer inviting subjects for study. Acquaintance with a plant is not complete till it is seen in all its phases. The evergreens may not exhibit any essential change of garb in summer and in winter, but they seem more isolated now and contrast more impressively with their deciduous-leaved neighbors. The leafless branches of the deciduous trees also show features of form and covering and teach lessons which are concealed when they are thickly clothed with foliage.

There is also a stillness in the woods in winter which is most impressive. This is due largely to the absence of animal life, and the feeling of loneliness is deepened by the plaintive murmur of the wind among the Pines. The cawing of the crow or the harsh cry of the blue-jay almost startles by its suddenness. But the sense of loneliness soon passes away, for though the currents of life in the forest-vegetation are in suspense the trees themselves are here, ready to furnish lessons and companionship.

One of the first plants to catch the eye in the Pine Barrens, where the soil has sufficient strength to bear it, is the Climbing Bitter-sweet (*Celastrus scandens*). It does well in the moist sands near the lake, holding to the small trees by its twining, rope-like stems. In the early winter its branches are spangled with fruit, the open valves of the orange-colored pod spreading out like a border and exposing the scarlet aril which covers the seeds. Few sights are gayer at this season than the bright fruit, set in a background of the sombre, leafless branches of the vine and its supporting tree. Near by is another climbing vine, the Greenbrier; its dark green, prickly stems clambering over the shrubs and contrasting with their duller hue like a line sharply drawn across them.

There are other shrubs with red or yellowish fruit often met with in the sands or beside the sloughs. Among them are four species of Rose, their stems usually red or reddish in the winter, with a hue more pronounced than in the summer. The hips of *Rosa blanda* and *R. humilis* are apt to be shriveled and dull, not so lasting as those of *R. Carolina*, which keep their form and colors, being plump and bright, and clinging profusely to the bushes in winter. In the wetter ground, where the latter grows, or along the lake-shore, clumps of *R. Engelmanni* are seen, with its oblong fruit still in good state of preservation and rivaling that of *R. Carolina* in abundance. The hips are not generally so ruddy, but have a yellowish tinge. Just before Christmas I looked for the scarlet fruit of the Winterberry (*Ilex verticellata*), but failed to find any, though it was plentiful on the bushes late in the fall. Probably the birds are responsible for their barren look, for they are fond of the berries. But it is not always thus, for the numerous clumps of Ilex by the borders of ponds will display their red berries in the winter, as the common name affirms.

Not so tempting nor so worthy of notice are the clusters of small, whitish berries of the Poison Ivy (*Rhus Toxicodendron*), a common plant in the sands, especially along the roads and cattle-paths. It is almost always the erect form of the plant, a foot or two high, which we see, or the one which runs along on the ground, sending up short branches. It retains its fruit all winter, for this may be found late in the spring, or well up to the time of flowering again. Doubtless it partakes of the poisonous properties of the plant, so that birds avoid it, for I have never seen it eaten by them. Its dun color does not make it prominent like the bright-colored fruits which allure birds, even if it is edible by them. The Stag-horn Sumach (*R. typhina*) is a more attractive shrub than its poisonous relative, and quite common by the borders of woods and in their open spaces, its crimson leaves making it one of the most brilliant features of autumn. The large thyrsoid clusters of fruit, clothed with crimson hairs, still cling to the ends of many of the stout, straggling branches, and serve to make it a conspicuous object in the winter also. The blunt, clumsy branches, dark with sooty bark and hairs, are in marked contrast with those of any neighboring shrub. In handling them one instinctively looks at his fingers to see if they have been blackened by the twigs. The buds are also curious, being deeply set in the midst of a large leaf-scar, and capped by a covering of light russet hairs, thus looking like a blunt cone surrounded by a broad, flat rim. The rudimentary leaves, buried under this copious coating of hairs, seem as if protected against arctic cold. The Fragrant Sumach (*R. canadensis*) is frequent on sandy banks and knolls. It usually occurs in patches of a limited area, but thickly covers the space it occupies. It is a dwarf shrub, but a foot or two high, and is a pretty object at any time of the year—in spring yellow with numerous flowers, in summer clothed with handsome, trifoliate leaves, interspersed with clusters of downy, red fruit; in autumn showy with richly colored foliage; grayish

* See Vol. II., December 11, 1889.

in winter and speckled with little spikes of flower-buds. These appear as the leaves fall off. They resemble small aments and will bear close inspection. They are formed of reddish brown rhomboidal buds, symmetrically arranged on the axis of the cluster. Each bud has a fringe of light-colored hairs, and a dark centre, sharply contrasting with this pale border, and looking as if set in a frame of hairs. The tiny spikes have a checkered appearance, and viewed in mass give to the plants a delicate charm.

The most common evergreen shrub is the Bearberry (*Artostaphylos Uva-ursi*), literally covering the surface of some of the sand-ridges near the lake, and abundant in places farther away. The globular berries, dark red or brown, still hang to the vines, but the varied colors of the leaves are their chief distinction. In sheltered localities some of the thick obovate or spatulate leaves remain of a shining green, but the greater part have assumed tints of brighter color. The typical colors, aside from green, are crimson, purple and vinous, and there are all gradations in the shades connecting these. The nearer leaves, near the ends of the stem and branches, are mostly of the brightest colors, especially the crimson shades. These colors often give to the ground a very gay appearance, as if covered by a carpet of variegated pattern, the splashes of color being extensively intermixed. When the stems rest upon a slope the effect is striking, or even brilliant. The stems are slender and whip-like, branching but little. They sometimes have a length of four or five feet, particularly on the slopes of ridges near the shore of the lake, where they run along the surface of the sands and attain their greatest vigor. Gathered at this season, or late in the fall, after the leaves have changed, they serve admirably for decoration. The leaves remain attached to the stems a long time in the dry heat of a house, and retain their colors well, so that they can be kept upon a wall from one season to another.

Englewood, Ill. *E. J. Hill.*

How We Renewed an Old Place.

II.—PLANTING WILLOWS AND PINES.

WHEN one has nearly half a mile of boundary to define around his four-acre lot, the question arises how it can be enclosed with the least expense and trouble, and in such a way as not to disfigure the grounds. With this problem we had now to deal.

The front upon the main street, thanks to the sociable fashion of our day, it would be quite proper to leave open, with only such screen of shrubs and trees as we should decide upon when the house was built, and the lawn properly graded. Part of it was already well hedged in with ancient bushes which straggled about, where the old house stood, in most admired disorder. But all along Winter Street, as the lane behind us is somewhat ambitiously designated, the fence was tumbling down, and the whole garden spot lay uncomfortably open to view, as well as to the cold east winds that blow across the meadow from the sea. We decided that here a row of Willows would come in admirably, as there would be plenty of rich moist soil for the young trees to root in, and with such a protection the wind-swept garden would in time be warm and secluded, while the silvery foliage would be a harmonious setting for the emerald meadow, and the sapphire stream.

This idea we carried out the week after we made our purchase. A friendly farmer neighbor, compassionating our folly in starting such an enterprise, but anxious to see what we would make out of the place, kindly offered to give us as many cuttings as we wanted, so one bright day in June he appeared upon the scene with a cart-load of Willows, a crowbar, and a hatchet, and, with a man or two to help him, before night he had cut and driven firmly into holes, easily punched by the crowbar in the soft soil, some five hundred bare stakes, every one of which in a few weeks put forth a crop of roots and leaves.

The stakes, sharpened at the end, were about three feet in length, one foot of which was driven into the ground, and firmly stamped into place. It was found better in driving them to have them set at an angle of about twenty degrees, with the tops pointing toward the south, so that the stems did not receive the full force of the midday and afternoon sun. We used the common White Willow (*Salix alba*), which abounds along swampy road-sides everywhere in New England.

These trees have all thriven well, though, owing to the marsh being salter in certain places than in others, some have grown less rapidly than their companions. The fear of the salt-water led us into the error of planting one row of trees at first inside the fence, and at some distance from it, where the presence of Clover and English Grass showed that the top soil was fresh. Subsequently, when they were well rooted, we removed them to the outside along the highway, where they now begin to make an agreeable shade, and an effective screen. The annual dumpings of sand made by the town along the edge of the road, to maintain its level which constantly tends to sink into the marsh across which it has been carefully built, seem to help the trees, which continue to send out surface-roots as the ground rises about them; and though some of them during their first seasons had a sorry time of it in dry, hot weather, they ultimately pulled through, and are no longer sources of anxiety.

The most exposed portion of the place being thus provided for, we turned our attention to the barren hill-side, which was a pretty hopeless-looking spot for trees of any kind. This elevation, some forty feet high and running back nearly 600 feet from the main street, seems to be the bank of some former water-way; at least I like to fancy that the odd terraces, which break its otherwise even slope, represent the gradual subsidence of some body of water which must once have filled the gorge, when the present meadow was an arm of the sea. Gravel and sand, mixed with moderate-sized cobble-stones, are its constituent parts, nothing like a boulder having come so far down. We have often regretted that some of the noble rocks which abound on the other side of the street, farther up the former stream, were not on our hill to form a feature in our landscape-gardening, marked as they are with the scratches which show the grinding of some primeval glacier.

Over the rough foundation of our hill a thin soil has formed itself; fairly deep on the level top where the plain begins, but constantly washed off down the sides into the swale below. It seems hardly possible that trees can ever have grown here, nor are there the smallest traces of any in or upon the soil; but here we resolved that trees should grow; and again the farmers mocked at such a wild idea, and looked forward with sombre satisfaction to our discomfiture.

But how to set about it?

To plow the surface, unless we could yoke a goat to the plow, seemed impossible, since we had just seen a man and a horse and a dump-cart roll together, in a confused but unharmed heap, from the top to the bottom, on account of an incautious step off of the level. Even if we could have plowed the ungrateful soil, of what use would it have been, since there was nothing to bring to the surface but stones? Cultivation being apparently out of the question, the trees would have to take their chance, and a wretched chance, too, for the south shore of Massachusetts Bay is subject to long and severe droughts and to several months of hot weather in the summer.

But here we were upheld by our authorities. An excellent book on forestry gave us some consoling statistics, and later, GARDEN AND FOREST was invaluable in its suggestions. We found that in reforesting hills in France and Switzerland that had been swept bare by avalanches, a north-east slope proved the most favorable exposure for the growth of young Pines, and, if we had nothing else, we had plenty of north and east, with the winds thrown in; so, if that was the sort of thing that they liked, why, bring on the Pines, and let them have all they want of it.

But by the time we got round to this job, as the farmers say, the season for spring-planting of Pines was over, and an exceptionally dry and burning summer was in full blast, and the very grass on the hill was crisped and dry. Our impatience, however, was too great to permit us to wait for another year to begin our experiment. We had read some accounts of August planting of Pines, and determined to have our little fling on the spot, and find out for ourselves whether it was a good time or not.

So we waited, as anxiously as the prophet Elijah, for the first sign of rain, and when at last the brassy heavens veiled themselves in cloud about the middle of August, we started off after trees—not the pampered darlings of a nursery, used to water and rich soil, but the hardy road-side denizens of dry pastures and sand-hills. We picked out the driest and sandiest spots to dig them in, so that if their roots discovered nothing to feed upon in their new locality, they would, from long habit, have got used to short commons, and could adapt themselves to the situation.

Before going out we had the men dig holes over the surface of the side hill with a grub-hoe, banking up the thin soil at the lower sides of the holes with sods, so as to make little dams to retain the water; in these holes we set the trees we selected, which were not over three feet high, but stocky and well rooted. When possible we took up the dirt with them, keeping their roots moist, and well shaded in the cart, and no more were brought at a time than could be set in two or three

hours. After they were all planted, with great labor and trouble, we gave our nursery a thorough watering, and then, except on two or three subsequent occasions, when things looked really desperate from drought, they were left to take their chance. Luckily that year the rains began to fall soon after they were set, and the autumn was a very wet one, so that a good many of the little trees were living in the spring; greater part are flourishing bravely, making a fine show in winter against the snow. In summer they shade so completely into the unkempt green background of the hill that, unless seen in profile, they are barely visible, even when five feet high, and very bushy. Still farther back we have tried setting out very small Pines, and have sown the ground in autumn with countless Pine-seeds, and nuts of all sorts, which come up

Fig. 29.—Phyllanthus pallidifolius.—See page 162.

but another batch, set in the latter part of May the following year, owing possibly to the very heavy rains of 1888 and 1889, did so much better, that we shall always be disposed to give the preference to spring planting in the future.

Of some 150 Pines set out upon this barren northerly hillside, under these cruel conditions, about eighty survive, a few of which are still leading a precarious existence, while the satisfactorily enough, and do bravely for a month or two, but suffer dreadfully in July and August. They are a fruitful source of anxiety and disappointment, because they cannot make up their minds whether to live or die. The young Oaks are especially trying in this respect, for when we have fairly given them up for lost, they thrust out a feeble little leaf and make a fresh effort at existence, but at this rate a millennium

will be too short for them to get their growth in. I have read somewhere that an Oak grew from an acorn in this commonwealth of Massachusetts, forty feet in fourteen years, but if these hill-side acorns achieve fourteen feet in forty years we shall feel we have not lived in vain.

"What do you do to make trees grow?" I asked an Englishman who was coaxing along a rebellious Butternut to some show of vigor.

"Oh!" said he, "I just talks to 'em, and tells 'em to grow, and they grow."

Mindful of this advice, I do not fail to exhort these recreant acorns, but no teacher of a primary school ever had a worse time in getting a shoot out of a young idea, than do I out of this infant class of refractory nuts and seeds.

Hingham, Mass. *Mary C. Robbins.*

New or Little Known Plants.

Phyllanthus pallidifolius.

THIS plant, which is a native of Java, is more often met with in gardens, under the name of *Reidia glaucescens*. It belongs to a vast genus of the Euphorbia family, with four or five hundred species scattered over the warmer parts of the world's surface. The name is formed from two Greek words, meaning leaf and flower, and was given to these plants because, in some of the species, the flowers are produced from the edges of what appears to be the midrib of a long compound leaf, but which is really a branch, the organs which look like leaflets being true leaves.

Phyllanthus pallidifolius will not, perhaps, interest people who find little to admire in plants which do not produce large and showy flowers. It is a small shrub of graceful habit, with bright fresh green foliage, pale and glaucous on the under surface, as beautiful as that of many Ferns. It is, for this reason, well worth cultivating in collections of stove-plants. The flowers, which are graceful and pretty, are produced during the summer and autumn in great profusion, and hang from the branches on long, slender, bright red pedicels, the males solitary or a few together from the axils of the lower leaves, the females solitary toward the ends of the branches. They have no petals, but the sepals are yellow, with fringed margins, and are marked with bright red at the base. This plant, like the others of the genus which are occasionally cultivated, flourishes in a compost of sandy loam, mixed with a little fibrous peat, and requires thorough and careful drainage. It may be easily increased by cuttings struck with bottom heat.

Our illustration on page 161 is from a photograph of a plant in the collection of Mr. J. L. Gardner, of Brookline, Massachusetts.

New Orchids.

Cochlioda Noezliana, Rolfe.—This is a charming novelty, of very graceful habit, bearing a branching panicle of medium-sized, orange-scarlet flowers with a yellow disc. It was introduced by Messrs. Linden, L'Horticulture Internationale, Parc Leopold, Brussels. A plant was exhibited at a meeting of the Royal Horticultural Society on November 11th last, when it was awarded a botanical certificate. It is dedicated to Monsieur John Noezli, its discoverer. According to an advertisement in the *Gardeners' Chronicle* for February 28th last (page 258), the species is a native of the Andes of Peru, growing at an elevation of 9,000 feet above sea-level. It belongs to a small genus closely allied to Odontoglossum, under which genus and Mesospinidium the species are generally known in gardens.—*Lindenia*, vol. vi., p. 55, t. 266. (English edition, vol. i., p. 9, t. 266.)

Peristeria aspersa, Rolfe.—An interesting species, allied to *P. Rossiana*, Rchb. f. It was discovered by Monsieur Bungeroth on the declivities of the Sierra de Marawaca, one of the most elevated mountains of the Parama chain, in Venezuela. This collector sent specimens to Messrs. Linden, L'Horticulture Internationale, Parc Leopold, Brussels, in whose collection it flowered last year. The flowers are borne in short racemes of about ten each, the color light brownish yellow, densely spotted or speckled with innumerable small spots of reddish brown, and the lip of a darker color, bordering on crimson.—*Lindenia*, vol. vi., p. 57, t. 267. (English edition, vol. i., p. 11, t. 267.)

Schomburgkia Sanderiana, Rolfe.—This is a very handsome Schomburgkia, introduced by Messrs. F. Sander & Co., of St. Albans, about three years ago, and now flowering for the first time. It is a plant of medium size with hollow pseudobulbs, very rigid leaves, and a lax, somewhat branched, panicle of rosy carmine flowers. It is allied to *S. Humboldtii*, Rchb. f., which, however, is easily distinguished by its much more elevated and acute keels, and other differences.—*Gardeners' Chronicle*, February 14th, p. 202.

Cypripedium × Creon, Veitch.—A new hybrid raised between *C.* × *Œnanthum superbum* and *C.* × *Harrisianum superbum*, the latter being the seed-bearer. It is about intermediate in character; the dorsal sepal is dark red-brown, with a white margin, and the petals and lip pale red-brown. It was awarded a first-class certificate by the Royal Horticultural Society on February 10th last. It is curious to note that both the parents are themselves hybrids.—*Gardeners' Chronicle*, February 14th, pp. 214, 215.

Bulbophyllum inflatum, Rolfe.—This is a very remarkable little Bulbophyllum, which was received from Sierra Leone in 1887, and flowered in the Kew collection in 1889, and again in the following year. It is closely allied to *B. comatum*, Lindl., a species from the same country, not known in cultivation, though quite distinct in its inflorescence. The racemes are like pendulous, egg-shaped masses of yellowish green, hairy flowers. This peculiarity is owing to the shape of the rhachis, which is swollen in a remarkable manner, forming a solid, fleshy, ellipsoidal body, an inch long by half as broad, on which the flowers are densely arranged. The hairs on the flowers are remarkable in their origin. Each sepal is strongly keeled, and it is these keels, particularly those of the lateral sepals, which break up into long hairs, while the margins of the sepals are almost or quite smooth. The name is given in allusion to the peculiar swollen rhachis. It is a very free-flowering little species.—*Gardeners' Chronicle*, February 21st, p. 234.

Kew. *R. A. Rolfe.*

Cultural Department.

Some American Oxalis.

I BEGAN many years ago to collect bulbous and tuberous plants, and the genus Oxalis has been a favorite of mine from the beginning, but so incorrect are the names that are supplied with the bulbs that the trouble of identifying the species has been almost equal to the pleasure of possession. It would seem that the names of South African kinds, and of Mexican kinds, however confused among themselves, might be kept distinct, but they are not, for the only firm (an Italian one) which now has the names *O. Jacquiniana* and *O. vespertilionis* on its lists, sends two Cape species to those who order those kinds, though both are Mexican.

About forty sorts are indigenous to Mexico and Central America, including *O. stricta*, which is found the world over, and of these not more than five or six are obtainable. One more of the group, *O. Drummondi*, I am glad to find offered this spring by Gillett and Horsford, from whom we always expect something interesting.

The bulbs of the American section are not hard and solid like those of the Cape, but of a much looser structure, and are soft enough to yield readily to the pressure of the finger and thumb. All the kinds are summer-blooming. *O. lasiandra* has been in cultivation in this country longer than any other Mexican sort, having been introduced many years ago by James Vick, who saw it used as an edging in European gardens. Its flower and leaf stalks reach a height of twelve or fourteen inches, and, as their growth is not so tufted as in the other kinds, they look somewhat weedy before the season is over, the tall stalks, with the remains of the early blossoms, lying out in all directions. Nevertheless the plant is well worth growing. Its leaves are composed of from five to nine long, narrow, dark-green leaflets, radiating like the leaves of *Cyperus alternifolius*, altogether unlike those of any other Oxalis I have ever seen. The flowers are bright rosy crimson, of medium size, and produced in clusters.

Oxalis Deppei is a very fine species. Its foliage is light green, of the familiar clover-leaf form, each leaflet being marked with a broad chocolate-colored mark like the letter V. The flowers are light crimson, and are produced all summer. The foliage of this and the following kinds is very dense and tufted, and, of itself, no slight ornament to a garden.

O. tetraphylla has four leaflets instead of three to each stalk; their color is much darker than in *O. Deppei*, and the blotch is deep brown. When the leaflets are unfolded the four combine in such a way as to make a nearly perfect square. The flowers are lilac, with a white centre, and, like those of the other species here described, are produced in abundance from June until frost appears.

O. latifolia has flowers much like those of *tetraphylla*, but the leaflets, which are arranged in threes, are very broad, and have a deep, wide notch in their outer sides.

O. lilacina is another species much resembling *tetraphylla*. Its flowers are a little smaller, and a little lighter in tint, and its rounded leaflets are in threes. No one who has one of these needs the other, unless he desires to grow as many species as possible.

I have two other species under the name of *O. elegans*. One is undoubtedly a variety, *O. hirta*, a South African species; the other, though evidently American, being much like the species already named, in time of blooming and general appearance, is very unlike the true *O. elegans*, which is a Peruvian species of great beauty, if we may trust the figure in the *Botanical Magazine*.

O. umbrosa is a very pretty species to plant in clumps or lines, as its foliage is very dense and very bright and fresh in color. It has no zone of brown as most of the other kinds have. Its flowers are white.

The Committee on Nomenclature of the Society of American Florists will do horticulture a service if they will stop the sale of this species under the name of *O. Deppei*, as is now done by many dealers.

All of the species described in this article are very susceptible to cold; the least frost kills the tops, and, of many hundred bulbs left out over winter, not one has lived until spring. In growing these sorts care must be taken not to plant *O. tetraphylla* and *O. latifolia* near any other sorts, as they send out subterranean runners to the distance of twelve or eighteen inches, each bearing a new bulb at the tip—a habit of growth which results in mixing the kinds if they are closely planted. The other kinds make their new bulbs in a cluster at the crown of the plant.

All of these kinds have a translucent root, shaped like a carrot. These are eaten in Mexico, but they have a disagreeable smoky flavor, very unacceptable to a civilized taste.

Canton, Mass. *W. E. Endicott.*

Fig. 30.—View in the Parc Monceau, Paris.—See page 159.

Odontoglossum nebulosum.

WHETHER it is that this large-flowering species is somewhat difficult to grow satisfactorily, or that it does not produce its handsome blooms in greater abundance, it does not seem to be so highly appreciated as some smaller kinds, and it is rarely that a good word is spoken in its favor in the horticultural press. The flowers, which are borne on strong erect scapes, are from two and a half to three inches across, having white sepals and petals, the lower half of which is decorated with chestnut-brown blotches of irregular shape, and somewhat paler on the sepals; the roundish, wavy-edged lip is also white, with some large chestnut blotches in front of the bright yellow, two-lobed crest, which has sometimes small red spots all over it. The pseudo-bulbs are of moderate size, ovoid and flattish, with two sharp edges, and bearing two deep green lanceolate leaves, each about six to nine inches long, on the summit.

Great variation exists among the flowers, the result no doubt of cultivation. In some forms the sepals and petals are large and well-arranged, the chestnut blotches standing out prominently on the white ground; in others the segments are small

and badly shaped and of a dirty greenish white color, which gets confused with the blotches. Three varieties are recorded. One of them, Candidulum, was introduced over thirty years ago, it is said, by Messrs. Low, of Clapton, a form with no blotches on the sepals and petals, and only one or two, or even none, on the lip. This seems to be the same as the plant sometimes called Candidissimum. The variety Pattisonianum is not well known. Reichenbach described it in 1868 as having large white flowers, and as being a native of Oaxaco, whence it was introduced by Baron Karwinski. The name commemorates Dr. Pattison, who was the first to flower this plant, and *Phalænopsis Luddenanniana*, in England.

About 1833 the typical *O. nebulosum* was found growing on the trunks of Oak-trees in Oaxaca, Mexico, by Baron Karwinski, but it was not until the severe winter of 1837–38 that it found its way into cultivation in England through the means of Mr. Bateman, and then the first consignment did not last long, as the plants were coddled in a too high temperature, in accordance with the inexperienced views of Orchid-growers of that time. Some years later two other well-known plant collectors—namely, Galleotti and Ghiesbreght—obtained plants of this species, and the latter sent a consignment to Monsieur Linden, in whose establishment at Ghent it flowered in 1856. Since this time it has often been imported, but not in great quantities.

A temperature varying from sixty to sixty-five degrees Fahrenheit in winter to seventy or seventy-five in the height of summer is suitable for *O. nebulosum*. In late spring-time growth begins, and constant attention to watering is requisite from this time and onward during the summer months. The plants should be shaded from the sun when it becomes very hot, and plenty of air ought to circulate through the house without causing one to feel a draught. The usual compost of rough fibrous peat, with a little fresh sphagnum moss and charcoal, in combination with first-class drainage, is required in order to grow strong, healthy plants, with a fair show of flower-spikes.

Isleworth, London, W. *John Weathers.*

Zonal Pelargoniums for Winter Blooming.

PERHAPS the so-called Geranium is more widely known and grown than any other garden plant, and its dazzling colors are seen everywhere in summer. But its true value is never known or thoroughly appreciated until it is used for decorating a conservatory or window-garden in winter. In the summer season a sudden storm will destroy its masses of flowers in an incredibly short time, and days must elapse before the plants regain their fair appearance; but this is not the case with specimens protected from the weather, which produce an uninterrupted and brilliant display through the dull winter months. Besides this, it is only with such treatment that the best color of each individual variety is secured, and the infinite variety of tints, from the deepest crimson to the purest white, is defined. It is true that there are certain varieties which are most useful when grown out-of-doors during the summer, while others are only valuable for conservatory decoration. It is therefore necessary to have a selection from both classes if we would have a continuous bloom.

Many people think that greenhouse space had better be reserved for something better than Zonal Pelargoniums, and, therefore, those plants which are used for bedding in the summer are simply kept alive during the winter in a starved, kept-over condition. But if the best winter-flowering varieties are selected, and have an opportunity given them to develop, they will prove worthy of the most careful attention.

For successful winter-flowering Geraniums must be grown especially for the purpose, just as roses are grown. Strong cuttings should be taken from April to June, according to the size of the plants desired, and their duration of flowering, and inserted singly in small pots of sandy loam. Cuttings may also be rooted in sand and afterward potted, if care is taken that they should neither be dried up nor drenched with water. As soon as they have made a new growth, and the small pots are filled with young and active roots, they should be re-potted into four and a half or five-inch pots, using this time, as a potting soil, two parts of fibrous loam to one of thoroughly rotted manure. An old spent hot-bed, where leaves have been liberally used in making it, is an excellent manure, and so is a spent mushroom-bed. Of course, if the loam is stiff it will be necessary to add some sand to keep the soil open, and the pot should be carefully crocked and drained, because these plants need frequent watering in hot weather. Over a layer or two of crocks in the pot a thin layer of cinders that have been sifted through a sieve with a half-inch mesh will serve to keep the soil out of the crock and, at the same time, keep earth-worms from the soil, as they do not like to travel through the sharp cinders. The plants should be placed in an ordinary frame, on a good cinder ash bottom, and protected from drenching rains and wind and scorching sun. When planted out they need all the sun they can possibly get, but, while in pots, they will dry out so much more quickly that it is preferable to shade them a little to prevent the roots from drying, for this would give them a serious check.

The plants should be pinched back to make them bushy, and all flower-stalks should be picked off as soon as they are large enough to handle, and early in August those which are meant for early flowering should have their last shift into nine or ten-inch pots, in which the soil may be rather coarser than that in which they have been growing. They should be kept out-of-doors, watered well and well guarded against the ravages of caterpillars, which are apt to eat the under side of the leaves, and disfigure them. They should be housed in September, although, if the weather is dry, they may remain out longer, but the plants will suffer if the weather is damp and cold. A warm, airy and light house is best for them, and the temperature should be kept at from fifty-five to sixty-five degrees. They will need a few stakes, which are slightly spread, and the shoots should be tied so as to keep the centre of the plant open. The pinching of the flower-buds should be discontinued, but any strong-growing roots should be pinched back. After the pots are filled with roots weak liquid manure should be given occasionally, and also a top-dressing of well-rotted manure and a little bone-flour. Good plants in six-inch pots may be had from cuttings struck in June.

The following is a good list of varieties suitable for the conservatory or window-garden:

Single-flowered Varieties.—White: Queen of the Whites, Improved, International, Lily, Mrs. Benedict. Pink: Lady F. Russell, Mrs. Joynson, Norah. Salmon: Countess of Derby, Mrs. D. Saunders. Purple and Magenta: Richard Dean, Dr. R. G. Tucker, Lord Churchill. Crimson and Scarlet: Mr. H. Cannell, Brilliant, H. Cannell, Jr., Hyacinth, Rev. H. Harries, Lynette, Judge Brown, Fiery Cross.

Double-flowered Varieties.—White: La Cygne. Salmon: Queen of the Fairies. Scarlet: Golden Dawn, M. Bruant. Pink: Mary Geering, Glorie de France. Deep Crimson: Black Knight.

Dongan Hills, Staten Island. *W. Tricker.*

The Best Chrysanthemums in England.—The yearly analysis of the leading Chrysanthemum-blooms shown at the numerous English exhibitions is always interesting to those who make a specialty of this flower everywhere. While American varieties are becoming very numerous and taking year by year a leading place in our exhibitions, no grower can afford to neglect the varieties among which our English friends find the prize-winners. Comparatively little interest seems to be taken here in the Chinese incurved section, no stand of these worthy of notice having ever been seen at any of our shows. As a matter of interest we note the leading twelve varieties of 1890 at English exhibitions in the order of their rank: Miss M. A. Haggas, Miss Violet Tomlin, Empress of India, Queen of England, Lord Alcester, Golden Empress of India, Jeanne d'Arc, Lord Wolseley, John Salter, Princess of Wales, Prince Alfred, Golden Queen of England. As compared with former audits, this shows a falling off of Empress of India, which variety has occupied the foremost place for a number of years. The leading Japanese varieties show the usual shifting of places. The first dozen were: Etoile de Lyon, Sunflower, Avalanche, Edwin Molyneux, Madame C. Andiguier, Mademoiselle Lacroix, Val d'Andorre, Maiden's Blush, Jeanne Delaux, Stanstead Surprise, Mr. Ralph Brocklebank, Stanstead White. Eight of these varieties are introductions of 1886 and later. Whether the new kinds are really so superior to the older varieties, or simply that their novelty causes them to be grown more largely, only future exhibitions will show. It is curious to observe the almost entire absence of American varieties from the list of sixty-three varieties, Volunteer (Henderson) being Number 45, and Florence Percy (Allen) Number 46. The latter variety, like Mr. Ralph Brocklebank, is not highly esteemed with us, as it always comes very thin.

Elizabeth, N. J. *J. N. G.*

Ipomœa pandurata.—This plant is going the rounds of the catalogues as the "Perennial Morning Glory," and it will probably be widely distributed this year. It is quite safe to say that all who buy the plant will also buy experience. It is also true that the plant is very beautiful, a perennial and quite

hardy, being a native plant, and, according to Gray, found from Connecticut to Illinois and southward.

I well remember finding it wild for the first time and bringing specimens to the late Dr. Thurber for name. His words I repeat as nearly as my memory will permit: "Don't plant it, or if you do, don't try to dig it up, for if you do you will have a task that will last for years." His advice sufficed for me, and it was left to ramble over its native hedgerow where it was very ornamental. The plant has a very thick root which penetrates deeply, and every particle of this root, when broken off, will grow, so the more one tries to dig it up the more persistently does it appear over a wider area. But if one plants it where it is to remain to be gazed at for a lifetime, it would probably not spread or cause trouble. But there comes a time, in the history of most plants, when it seems best to remove them, or replace them with something else, or to dispense with them altogether. When that time in this Ipomæa's history arrives, trouble is to be apprehended. The moral is to plant the vine on a back fence or hedgerow, and not in any dressy part of the garden.

S. Lancaster, Mass. *O. O.*

Tomatoes under Glass.—In providing for a second crop of these, a trial is now being made of some unusual methods. Instead of raising seedlings to take the place of the old plants from which a crop had been removed, a large portion of the earth was removed from the boxes in which they grew, and the plants were coiled around in the boxes and covered with fresh earth, the ends of the plants being left projecting above the surface. In another lot the old plants were cut down nearly to the surface of the ground, and a single shoot was allowed to grow up from the stem. In both cases the young shoots, having all the roots of the mature plant to support them, have grown with great vigor. Both of these methods, but especially the second, seem to indicate at present that a considerable reduction in the interval between successive crops may be made by their use, as the plants have far outstripped, in growth and flowering, the seedling plants of the usual size which were transplanted beside them at the same time.

Cornell University. *C. W. Mathews.*

The Forest.

Prairie Forestry and the Timber Culture Law.—I.

THE proposed repeal of the Timber Culture Law, with no provision suggested whereby Government will offer any encouragement for the planting of trees on the treeless prairies, has led me to look into the question of how far the law has been instrumental in promoting tree-planting on the wind-swept plains. I began the study of this question with the impression that I had only to consult the records of the Government Land Office to find incontestable proof of the wisdom and value of the law. Such incomplete data as I have been able to secure have not inclined me toward the enthusiastic support of the measure in its present form, but I do not believe the figures warrant the repeal of this important law unless Government is ready to adopt a comprehensive system for the conservation of forests on the public domain, and attempt the planting of timber of its vast treeless plains. Little has been accomplished in the way of successful tree-culture under this law, much less would have been done had Government offered no inducement to the settler to plant trees.

In the land offices at Huron, Watertown, Mitchell, Aberdeen and Yankton 53,499 entries have been made under the Timber Culture Law. Had every entry thus made represented a different piece of land this figure would indicate the presence of 534,990 acres of trees on 53,499 sections of land, for but one timber-claim can be located on a section. But the figure first given represents the total number of entries, and when a claim is relinquished the land is returned at once to the public domain and is again subject to entry. The statistics of the Land Office are very faulty in this, and no data are obtainable by which the exact number of different pieces of land entered as timber-claims could be known. The Mitchell office reports 15,231 entries, 4,000 relinquishments and 920 proofs. The 15,231 includes all entries that may have been once or twice relinquished, and hence does not give a correct idea of the acres held under the law; neither do the 920 proofs thus far made afford a basis for estimate, because probably the majority of tree-claims are not yet old enough to be proven up. The Aberdeen office reports 7,287 entries, and the Register estimates 5,319 cancellations.

The authorities of the General Land Office at Washington estimate that ninety per cent. of all the timber-culture entries in the country are either fraudulent or failures. The final proofs submitted at the offices named above number 2,890, making about five per cent. of the entries; this would seem to prove the estimate a good one. But, granting the very great number of failures, the Timber Culture Law has placed on the prairies of South Dakota 28,920 acres of timber, every acre of which contains at least 675 trees; 2,890 groves on lands that otherwise would probably have remained treeless for an indefinite period. It is true that many of the claims on which proof has been accepted are far from being ideal groves, either in the quantity or quality of the trees that compose them, but a single winter in this windy state will teach that every tree that grows is worthy of respect.

Nearly all the settlers of Dakota came from the regions far better adapted to tree-culture than their new home. Naturally, when they saw the luxuriant growth of grass that covered the prairies, they concluded that the Timber Culture Law offered the easiest and cheapest means of securing land. Government designed to cover the naked prairies with groves, the ameliorating influence of which should be apparent in increasing ratio as the trees grew older. From the standpoint of the law the settler's first duty was to cultivate his trees and make his plantation a success; but he saw in the trees only one element of value, a means of securing a quarter section of land for a very small amount of money and effort. He soon found that the ten acres of trees, which brought no money return, demanded care and time which could be made an element of profit if put on the remaining acres of his claim. Every part of his tree-claim was a source of income but the ten acres which gave him title to it, and these were a constant expense. A very great number of those who made entries regarded the ten acres of trees as the one incumbrance on the land thus secured, and all such people naturally gave what they considered the least possible care to the trees that would insure them a title to the land. Many people believed that very little cultivation was necessary for trees (indeed, there is still prevalent a popular belief that too much cultivation is ruinous), and when to the wrong ideas of the inexperienced new-comer is added a lack of interest in trees for their own sake, the chances for success would be greatly against him. At the time when the greater part of the timber-culture entries in South Dakota were made, from 1880 to 1885, it was honestly believed by many settlers that trees would grow with very little care. When the trees died, as the great majority of them did, the planter attributed the failure to an "off year," and did not learn that no part of his land demanded so much attention as the ten acres that he had especially promised to care for.

The two causes for the many failures in tree-culture in this state are the planter's ignorance and his failure to cultivate intelligently. From what I have seen of tree-claims during my residence in the state I can testify that wherever trees were well planted and intelligently cultivated success was attained. I know of successes in the most unfavorable parts of the state, and failures are common in those parts of the state having the most rain-fall.

The great number of relinquishments have been in the hands of men who have been badly disappointed. Instead of being the cheapest way of securing Government land, any one who has proved up a tree-claim is very apt to say it is the most expensive land he owns. Congress was honest in making the law, and settlers thought they had a rare bargain. But both were deceived.

Agricultural College, Brookings, S. D. *Charles A. Keffer.*

Correspondence.

Notes on Nomenclature.

To the Editor of Garden and Forest:

Sir,—Nearly all botanists are thoroughly in unison with the present vigorous movement to place botanical nomenclature on a firm footing, in so far as this can be effected by the identification and establishment on the principle of priority of the oldest names of groups and species. Much has already been accomplished in this direction in recently published catalogues, notes, special papers, and notably in Professor Sargent's "Silva of North America" as far as published.

It is true, however, that in two or three peculiar cases the principle of priority has not, as a matter of fact, been rigidly adhered to; although in the particular instances referred to the avoidance of extraordinary combinations was doubtless a reason for not carrying out the law.

Dr. Britton, in his "Catalogue of New Jersey Plants," in referring to the question of reinstating the oldest specific and

varietal names, distinctly states that the "names adopted are based strictly on the principle of priority of publication, the oldest specific or varietal name available being retained in whatever genus the plant is located, or whatever its rank as species or variety."

Professor Sargent, in discussing this point, assumes the same attitude, and states that he has "adopted the method which imposes upon a plant the oldest generic name applied to it by Linnæus in the first edition of the 'Genera Plantarum,' published in 1737, or by any subsequent author, and the oldest specific name used by Linnæus in the first edition of the 'Species Plantarum,' published in 1753, or by any subsequent author, without regard to the fact that such a specific name may have been associated at first with a generic name improperly employed."

In the range of the "New Jersey Catalogue," the author was called upon to consider the specific names of three species—Box-elder, Catalpa, and Sassafras—in the disposition of which we have illustrated the first exceptions in this work to the otherwise rigidly adopted law of priority. Other authors of subsequent publications, in disposing of these plants, have done no less than follow an accepted authority, and have maintained *Negundo aceroides*, Moench; *Catalpa bignonioides*, Walter, and *Sassafras officinale*, Nees. The new Silva, so far as now published, has not, of course, reached these questionable points; nor are we at liberty to anticipate what the author's decision is, or will be, when these cases are reached. We believe, however, that there can be but one decision, that of adopting the law without exception.

We do not wish to be understood as criticising Dr. Britton's position, for he has doubtless critically surveyed the ground upon which this question is raised, and for a good reason chosen to record an exception to the general law of priority already adhered to strictly by zoölogists, though, as it seems, not as closely by botanists. His reason, however, for not, in these instances, taking up the oldest specific name for the Box-elder and Sassafras, cannot, we believe, be for lack of evidence to identify with them Linnæus' earlier names—*Acer Negundo*, *Laurus Sassafras*, and *Bignonia Catalpa*.

But the time has arrived, it would seem, when what may by some be considered as valid objections, in fact positive reasons for calling a halt in the adoption of a certain type of specific name, must be waived, at least if we would appear consistent with the object—stability of nomenclature, toward which we are tending and for which so much hard work has been and is to be done.

The principal errors to be avoided in creating new and in reinstating old names need not be detailed here, but chief among them is that of employing a name which shall, if specific, be distinct from any other used in the same genus. Considering this, therefore, as the primary object in the application of a name, it practically matters but little what the combination finally becomes, by properly locating the plant, so long as it is distinct. It will not be any more easily remembered or better serve to avoid confusion with other names, whether we call it *Negundo aceroides*, or if we restore the oldest specific name, *Negundo Negundo* (Linn.) In other words, a name is a name, and although in the form just given not the most perfect, nevertheless quite as satisfactory as the many specific names in use which either have no meaning at all, or in their significance attribute to a plant a character positively not possessed.

But in urging the necessity of following strictly the law of priority in such cases as that of the Box-elder, we wish not to be understood as recommending the creation of new names in which the generic and specific members are exactly alike, but as referring in the opinion here expressed only to names already published, and therefore unalterable. Furthermore, the framers of the botanical code, in seeking to avoid the creation of such names as *Negundo Negundo*, adopted an article which prescribes that, "In constructing specific names, botanists will do well to give attention to the following recommendations"; and the one which covers this point is, "Avoid specific names having, etymologically, the same meaning as the generic name."

Doubtless this article, together with a natural repulsion felt for so redundant a combination as *Negundo Negundo*, has led botanists to stop short in the restoration of such specific names. But the principle urged in the code, and the spirit of those seeking to carry it out, is that each plant shall bear the "most ancient" designation, "provided it is consistent with the essential rules of nomenclature." And in examining the ground on which inconsistency may be charged in taking up, for example, *Negundo Negundo*, it is obvious that in such an attempt one would be perfectly in line with all of the "essential rules." For it is possible, if not quite fair to suppose from the language of the rule just quoted, that it had for its object only to prevent the original construction of a specific name like its genus; presenting, therefore, an entirely different case from the present difficulty, which is not "constructing" a specific name, but forming a combination in which the "most ancient" name published is applied to the species; so that whether foreseen or not this peculiar difficulty was clearly overlooked, and not provided for in the code.

Aside from the point here raised for settlement, many other troublesome questions have arisen in the attempt to re-establish obsolete names, and, so far as the botanical code furnishes sufficient authority for such difficulties, there is perhaps no reason for departing from accepted decisions. But it seems there are cases which have required further authority, for which botanists have had recourse to laws adopted by zoölogists, particularly ornithologists. In other cases, even a perhaps sufficient law in the botanical code has been discarded for one of the zoölogists' covering the same ground, but with different limitations. An example of this is the somewhat general adoption by botanists of the zoölogists' method of citing the original author of a specific term (when taken from its original genus) in a parenthesis, with the author of the combination outside; whereas, the botanical code requires only the latter name.

It seems, therefore, inasmuch as authority for minor cases has already been derived from the zoölogists, that we can do no better than follow their advice in the present difficulty and adhere without exception to the law of priority, a decision, too, which must tend to still more harmonize the usages of botanists and zoölogists.

If, then, we are to be guided by the zoölogists in the question of taking up for the Box-elder, Sassafras and Catalpa the oldest specific names, which would give for *Negundo aceroides*, Moench (1771), *N. Negundo* (L.) (= *Acer Negundo*, L., 1753); for *Catalpa bignonioides*, Walter (1788), *C. Catalpa* (L.) (= *Bignonia Catalpa*, L., 1753); for *Sassafras officinale*, Nees (1821), *S. Sassafras* (L.) (= *Laurus Sassafras*, L., 1753), to which may also be added the European Larch, *Larix Larix* (L.) (= *Pinus Larix*, L., 1753. *L. Europæa*, DC., 1805), it may be of interest, if not some comfort, to know how many names of this peculiar type are already in use among the ornithologists, mammalogists and ichthyologists.

The following examples among the birds are taken from a revised edition (1889) of the "Check-list of North American Birds," published by the American Ornithologists' Union; those of the mammals and fishes are taken from Jordan's "Manual of Vertebrates" (1888).

Birds: *Soula Soula* (Linn.), *Ajaja Ajaja* (Linn.), *Nycticorax Nycticorax Nævius* (Bodd.), *Porzana Porzana* (Linn.), *Crex Crex* (Linn.), *Gallinago Gallinago* (Linn.), *Vanellus Vanellus* (Linn.), *Lagopus Lagopus* (Linn.), *Zenaida Zenaida* (Bonap.), *Buteo Buteo* (Linn.), *Nyctea Nyctea* (Linn.), *Pica Pica Hudsonica* (Sab.), *Cyanocephalus Cyanocephalus* (Wied.), *Xanthocephalus Xanthocephalus* (Bonap.), *Icterus Icterus* (Linn.), *Carduelis Carduelis* (Linn.)

Mammals: *Vulpes vulpes* (L.), *Gulo gulo* (L.), *Bison bison* (L.), *Phocaena phocaena* (L.); less similar are: *Alce alces* (L.), *Delphinus delphis* L., *Mephitis mephitica* (Shaw), *Mus musculus* L.

Fishes: *Mola mola* (L.), *Hippoglossus hippoglossus* (L.), *Lota lota* (L.), *Sarda sarda* (Bloch.), *Anguilla anguilla* (L.)

Forestry Division, *George B. Sudworth.*
United States Department of Agriculture.

The Western Arbor-vitæ.

To the Editor of Garden and Forest:

Sir,—In your article on this tree, published in Garden and Forest of March 11th, you say, "*Thuya gigantea*, unfortunately, is not hardy in the eastern states, and, like many of the trees of the Pacific forests, it cannot be used to beautify and enrich our plantations." Now, in British Columbia the western Arbor-vitæ grows not only along the coast, but at different places as far eastward as the western base of the Rocky Mountains proper, several hundred miles inland and northward in the region of the Interior Plateau, certainly to beyond the fifty-third and probably to beyond the fifty-fourth parallel of latitude. (See Report of Progress Geol. Surv. Can., 1879–80, p. 171 B.) In these inland stations it flourishes often at a height of several thousand feet above the sea, and is subjected, though for comparatively brief periods, to winter temperatures as low as those of any of the inhabited parts of the Province of Quebec. Arguing from these facts, and from the experience gained with

other trees tending to show that there is a wide margin of variation in hardiness within the limits of a single species, I am inclined to believe that young trees obtained from these inland localities might be successfully grown in the east. The circumstances appear to indicate that the western Arbor-vitæ is not bounded inland by low winter temperatures so much as by aridity of climate. Where the interior climate is dry, the tree is found only in deep humid valleys or ravines. It would thus appear to me to be more than probable that young trees brought, say, from the Selkirk or Gold Ranges of British Columbia, might be successfully established in most sheltered localities even in the eastern states and eastern provinces of Canada. Possibly this experiment has already been unsuccessfully tried, but, if not, it would seem to be worth trying, as the western Thuya when well grown is certainly one of the most beautiful trees on the continent.

Geological Survey of Canada, Ottawa. *George M. Dawson.*

[An attempt was made several years ago to establish the western Arbor-vitæ in the Arnold Arboretum with seedlings raised from seed collected in northern Idaho, where the climate is very severe. The plants, although carefully protected, were not able, however, to survive the Massachusetts winters. Another attempt to find a form of this tree which will prove perfectly hardy in the east should be made with seeds brought from the Selkirk Mountains and from other regions of British Columbia with extreme climates. Perhaps Professor Dawson can aid us in this matter.—Ed.]

Exhibitions.

The Boston Spring Flower Show.

THE spring exhibition of the Massachusetts Horticultural Society, which was held in Boston last week, delighted many visitors, who seemed to find their chief interest in two small natural rock-gardens which had been arranged on the floor of the lower of the two halls of the Society, and filled with forced hardy shrubs, forced bulbs and other perennial plants. The larger of these two collections was set up by Mr. C. J. Dawson, a young gardener in the employ of the horticultural department of the Bussey Institution, and did much credit to his taste and skill in selecting and arranging his material; the other, in which a smaller variety of plants appeared, was the work of the Botanic Garden at Cambridge, which institution exhibited various hardy shrubs in flower. It is always a question whether the surprises and pleasures of spring and the outdoor garden are not dulled somewhat by advancing the season by bringing into winter the plants whose flowers give to spring its peculiar charm, and whether if one sees Narcissi and Tulips, and the flowers of forced shrubs, Lilacs, Japan Apples and Spiræas all winter long, the keen delight which is felt at the north at the sudden change when winter melts into summer, and myriads of flowers open, must lose something of its delightful freshness. There is, however, one decided advantage in an exhibition of this character. It enables people who wish to make a selection of hardy plants to see them in flower just at the planting-time and to see what the best plants are for their special purposes.

It is now very much the fashion to force hardy plants to bloom out of season, and a great show can be made in this way with small outlay of money and without the skill and patience required to bring to perfection winter-blooming tropical plants which are now too much neglected, although they really belong to the winter season, and should then furnish the principal decoration of the greenhouse and conservatory.

Roses and Carnations were shown in large numbers, and, as is the case almost always in Boston, they were of excellent quality. Tea Roses were more abundant than Hybrid Perpetuals, and this, as indicating the return to popular favor of the Tea Rose for winter, is a matter of congratulation. The Tea Rose is the Rose to raise under glass, and no other Rose can equal it in delicate beauty and graceful refinement.

As examples of good cultivation, no plants in the exhibition equaled the group of Cyclamens and Cinerarias shown by Mr. Kenneth Finlayson, gardener to Dr. C. G. Weld, of Brookline. The Cinerarias were selected from a large collection of these plants which have been the horticultural sensation in the neighborhood of Boston during the past month, and which have attracted many visitors. It is not probable that a collection of better-grown or better-flowered Cinerarias has ever been seen, although, unfortunately, the plants in the exhibition were a little past their best. The collection, as seen three weeks ago in Dr. Weld's garden, was a marvel of horticultural excellence. The plants were of a remarkably good strain, bearing a large variety of enormous bright-colored flowers. It may be of interest to note that the seed from which Mr. Finlayson raised these plants was selected by himself from a strain of his own.

Indian Azaleas were shown in a number of specimens in considerable variety; they lacked, however, substance and finish, and showed the effect of having been brought forward in too much heat. Orchids were not up to the standard set in previous Boston exhibitions. Of hardy plants, the most interesting for their novelty was a small group of the beautiful Japanese *Primula Sieboldii* exhibited by Rea Brothers.

Recent Publications.

A Move for Better Roads. Essays on Road Making and Maintenance and Road Laws. Henry Carey Baird & Co., Philadelphia.

This book is one of the fruits of the wide-spread agitation for an improvement in our public highways. These essays are not solely arguments to show how great are the advantages of good roads to both town and country, but they enter into details and go carefully into the principles of road-construction as well as maintenance, and treat of the legislation which is needed to insure the best and cheapest wheelway the year through. The history of the work is this: In November, 1889, Mr. Wm. M. Rhawn offered to contribute, through the University of Pennsylvania, a prize for the best paper on the "Construction and Maintenance of Common Roads." The project received so much encouragement from the Provost of the University and Professor Haupt, the head of the Engineering Department, that the plan was enlarged through the organization of a committee and the opening of a subscription fund, until at last prizes of $400, $200 and $100 were offered by the committee, and the competition was thrown open to all. The first prize was awarded by the very competent Board of Adjudicators to Henry Irwin, Assistant Engineer of the Canadian Pacific Railway; the second prize to David H. Bergey, North Wales, Pennsylvania, and the third prize to James Bradford Olcott, of South Manchester, Connecticut. These essays are collected in this volume, together with five others which received honorable mention in the competition. To them is added a digest of the contents of the remaining essays offered in competition for the road prizes besides some contributions from other correspondents and some notes by Mr. Rhawn, making altogether a volume of more than 300 pages. The work has a good index and a still better table of contents, and, although little that is new can now be said on the subject, the book certainly presents in accessible form such general rules of road construction as non-professional readers ought to be interested in studying. The essays are prefaced by a series of resolutions by the committee to the effect: (1) That in the improvements of roads the Macadam system, consisting of small angular fragments of stone in sizes not exceeding from two to two and a half inches in the longest dimension, according to quality, should be used wherever a stone surface is practicable and justifiable. (2) That the minimum width of the metaled surface for a single track should be a demi-rod, eight and a quarter feet, and of such depth as the amount of traffic and character of the subsoil may require. (3) That the bed to receive the stone must be so prepared that it cannot be saturated with water, and, therefore, great attention should be given to the character and drainage of the subsoil. (4) That the width of the tires of wheels should be regulated by law, and that the minimum width of all heavy draught vehicles should be four inches, to be increased when the capacity of the vehicle exceeds half a ton per wheel at the rate of one inch for each 400 pounds in excess.

Stone of the proper quality for making a good road-surface is abundant in most parts of the country, and where it cannot be cheaply procured some fair substitute can be found, so that there is no reason why a few sample miles of the best possible road cannot be constructed in every township of the country which is sufficiently populous to justify this expense. This is the first step needed in road-reform. The chief reason why the people of the country do not insist upon better highways is, that they have never seen a mile of good road. When once they learn by experience what advantages are secured to them by the best roads, they will not rest until the common roads receive the same attention that is given to railroads. It is to be hoped that this book will have a wide circulation, for it will disseminate just such information as will prove of practical value in hastening forward the construction of these model bits of highway which must prove beneficial as object-lessons.

Notes.

In a portion of our edition last week the article entitled "Points in Chrysanthemum Culture" was not credited to Mr. John Thorpe, as it should have been.

In a paper on "Ferns," read before the Massachusetts Horticultural Society last week, Mr. George E. Davenport said that a single frond of *Aspidium Filix-mas* is capable of producing 18,000,000 plants, and one entire plant 1,000,000,000 seedlings.

During the census year 267,271 tons of grapes were sold for table use in the United States, and 304,868 were sold to wineries. More than 24,000,000 gallons of wine were made. Besides this 1,372,195 boxes of raisins were produced, each box holding twenty pounds.

A correspondent of the *American Florist* suggests the use of red flowering Cannas to supply the lack of scarlet flowers at Easter. Some pots of the bright blooming kinds, with good foliage, would be an admirable addition to the Palms and Lilies so generally used.

One of the largest wine casks in the world, according to the last census report, is in the Ohio vine region on the shores or islands of Lake Erie, although its exact location is not given. The cask is made of Ohio Oak, is of the finest cooperage, and contains 36,000 gallons.

The Bride continues to be the leading Tea Rose in the New York flower market. Niphetos, on account of its weak and drooping stems, does not suit the present fashion for Roses which stand up well. The Bride also has the slight pink tinge which relieves it from a dead-white and makes it much more generally serviceable.

The fourth of the "Farmers' Bulletins," so called, issued by the Department of Agriculture, relates to fungus diseases of the grape and their treatment, and has been prepared by Professor B. T. Galloway. We have in former issues given most of the information which is contained in this valuable bulletin, in which will be found the facts that have been brought out by the most recent experiments in the Department. Every grape-grower should be familiar with the new methods of treating the four diseases of the grape which are now the most destructive, namely, the downy mildew, the powdery mildew, the black rot and anthracnose. Copies of the bulletin will be sent to any one who applies to the Secretary of Agriculture at Washington.

The Verbena Mildew, so much dreaded by florists (*Oidium erysiphioides*, probably), has been very successfully combated at the Cornell Experiment Station this winter with a solution in water of potassium sulphide, at the rate of a quarter of an ounce to the gallon. A stock of plants was received in the early winter which was badly infested with the fungus. A part of the plants were occasionally sprayed with the fungicide, and, while traces of the disease still appear at times, it is rendered practically harmless. Another portion of the same lot of plants, growing under similar conditions, but without the application of this simple remedy, was soon entirely destroyed by the disease. This preparation has also been applied to Cucumbers infested with the same, or a similar fungus, with very satisfactory results.

In a census bulletin of viticultural statistics, just issued, it is stated that a grower of grapes in what is now known as the Lake Keuka district, in New York state, shipped his first crop, amounting to fifty pounds, to the New York market in 1845, by canal. The commission merchant who handled these wrote encouragingly to the shipper and advised him to send more grapes. The next year the grower was able to ship him between 200 and 300 pounds, but he overdid the matter, and the New York market for grapes broke under this tremendous pressure. Last year, from this same district, there were carried away to different cities 40,000,000 pounds of grapes, while those raised in the Hudson River district of the same state, and the Chautauqua district, where the industry has only been established for ten years, swelled the grand total to 98,000,000 pounds from New York state alone, and this does not include the grapes sold for wine, which probably amounted to 25,000,000.

A recent article in *The Grocer* says: Vanillin is the odoriferous principle of Vanilla, which, from a previous paper, our readers know to be the fruit of a plant called *Vanilla aromatica*. Vanillin exists in the Vanilla-pod to the extent of about two per cent. These pods used to be very expensive, but new sources of vanillin are being discovered, and it seems likely that the vanilla industry will soon be extinct. Vanillin, which is the only substance for which the Vanilla-pod is valuable, has been found in asparagus, raw beet-sugar, and assafœtida; it likewise results from the oxidation of Olive-wood. On a large scale it is prepared from coniferin, a compound which occurs in the sap of the cambium of Pine-trees. The latest source of vanillin has been discovered by Herr Schneegans in the seeds of *Rosa canina*. These are extracted with ether; part of the ether is separated by distillation, and the residue is agitated with sodium bisulphite solution, saturated with sulphurous anhydride. Dilute sulphuric acid is then added, and finally, after much washing and drying, a brown oil is obtained, which, in a few days, becomes a mass of crystals. Possibly the vanilla pod will find a new commercial rival in these *Rosa canina* seeds.

Although the last Congress failed to pass the law extending the boundaries of Yellowstone Park, it did enact a measure which repealed the Timber Culture Act, and in this repeal was a provision authorizing the President at discretion to withdraw from entry any public timber-lands. In the exercise of his authority, the President has made a proclamation to reserve a belt on the eastern and southern sides of the park, which practically increases its area by one-half. Of course this action is not sufficient to annex to the park permanently all this region so reserved from settlement, but it relieves it from immediate danger from lumbermen, and leaves it under Government control, so that the same provisions for protecting it from fire and other depredations can be made as those which now exist over Yellowstone Park. This new region includes the head-waters of the Madison, Snake and Yellowstone Rivers, and will thus protect the water-supply of the park, and it will also include the breeding region of the elk and other great game. It is not apparent that the railway company which has defeated the bill for eight successive years have gained any important advantage, because the President's proclamation does not give them the right of way which they have been demanding.

As it is probable that a larger and larger portion of the world's supply of sugar will come from the Beet, instead of the tropical Cane, it is not surprising that our experiment stations are beginning to investigate the possibility of making beet-sugar in this country. A bulletin from the Michigan Station, prepared by Professor Kedzie, gives two charts, one of temperature, and the other of rain-fall. In the first chart the curve for temperature at Halle, Germany, and at Cambrai, France, shows that the range of the thermometer at these places, which are great centres of beet-sugar industry in Europe, does not differ materially from that of Michigan. A similar chart shows that the rain-fall in Michigan compares favorably with that of the best sugar-beet districts of Europe. Altogether, the climatic conditions in the greater part of the lower peninsula of Michigan are very favorable for the production of good Sugar Beets. That is, there is a moist and growing spring-time, a summer filled with sunshine, and not so wet as to produce a sappy growth, and autumnal weather that will ripen up and round out the growth, which are ideal conditions for raising these Beets. Wherever, in addition to these climatic conditions, there is a sandy loam, with an open, porous subsoil, good crops of Beets can reasonably be hoped for. Many attempts have been made to manufacture sugar from Beets in this country, but most of them have been failures. The Michigan Experiment Station proposes to make a fair trial of the industry in that State, and it is desired to secure the services of fifty or sixty farmers to help them. It is suggested that the agricultural societies in various counties or townships will select two or three persons, and to such persons the seed necessary for the experiment will be sent free of expense.

Catalogues Received.

P. M. Augur & Sons, Middlefield, Conn.; Small Fruits, Fruit-trees, Shade trees, Vines and Vegetable Plants.—A. Blanc & Co., Philadelphia, Pa.; Hints on Cacti.—A. M. C. Jongkindt Coninck, Dedemsvaart, near Zwolle, Netherlands; Wholesale Trade-list of Coniferæ, Fruit-trees, Hardy Perennials and other Hardy Plants.—Gillett & Horsford, Southwick, Mass.; Wild Flowers and Hardy Ornamentals, Evergreen Ferns, Shrubs and Novelties.—Richard Nott, Burlington, Vermont; Choice Vegetable and Flower-seeds.—Rigby & Burleigh, Houlton, Maine; The Rigby Patent Potato Digger.—J. Sallier Fils, 9 Rue Delaizement, Neuilly-sur-Seine, France; New and Rare Plants.—Mrs. Theodosia B. Shepherd, Ventura, California; Plants, Shrubs, Flower-seeds and Bulbs.—Vilmorin-Andrieux & Cie., 4 Quai de la Mégisserie, Paris, France; Seeds of Shrubs, Trees and Vines for Out-door and Greenhouse Planting.

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A Flower-Garden for New York.

THE city of New York was startled a few weeks ago by the announcement that a bill had been passed through one House of the Legislature which authorized the covering over of the old reservoir on Fifth Avenue and the creation of a so-called air garden on the spacious floor thus provided. Fortunately this scheme was thwarted by the indignant protest of the people, but it calls attention to the question, What shall be done with this reservoir when the new system of water-supply shall render it no longer needful? In one sense this is a purely local question, but it has aspects which are of interest to all who care for the proper adornment of public grounds in cities. No single style of planning and planting is adapted to areas of all sizes and surroundings, and this space seems to offer an admirable opportunity for a special type of garden design.

Every New Yorker, and every one who has visited the city, is familiar with the appearance of the reservoir, a substantial stone structure 500 feet square. It has no remarkable features as a work of architecture, and yet there is no excuse for tearing it down for the mere purpose of getting rid it, for it is on the whole a pleasing and rather effective structure in appearance, and it gains interest and value because it is unlike everything in its neighborhood. Its simplicity in line and mass contrasts refreshingly with the elaborateness of the adjacent buildings, and its low sky-line agreeably breaks the long high perspective of the avenue and admits an unwonted amount of light and sunshine. And then, too, it is bordered by a strip of grass with well-disposed shrubbery and vines, so that it is in summer a truly welcome sight. It is better, therefore, that the reservoir should remain as it is, even if it were entirely useless, than that it should be replaced by another building of any kind.

Standing as it does between the small area known as Bryant Park and Fifth Avenue, there has been a considerable desire expressed to have it demolished for the purpose of extending this park. Of course an increase in the number and size of our urban pleasure-grounds is always worth considering, but, after all, the increase in the area of Bryant Park may be too dearly purchased. A mere extension of this park in its present character is hardly desirable. It is not as though this were in a crowded quarter of the city and far removed from Central Park. In such a case the sweeping away of any building for the creation of a park of any kind to enable the thronging population to find a green spot would be desirable. But this park is but a short distance from Central Park, and it is never crowded with the class of persons who throng Tompkins Square and the Battery Park. The only justification for the expense of removing one of the few structures of an earlier time that are worth preserving would be the assurance that the space it fills could be converted into a garden of genuine beauty that would be an appropriate ornament to our finest thoroughfare.

A mere duplication of Bryant Park would not accomplish this end. No park could be more deficient in design, dignity and charm. It is a commonplace assemblage of asphalt walks, badly shaped grass-plots and a monotonous planting of Silver Maples. It is not a formal park nor yet a bit of landscape, like Mount Morris Park in Harlem, and it is valuable only as an open and shady place and not as a delight to the eye of the passer. But if the reservoir should be removed there would be no need that its area should be treated in the same way as Bryant Park. What we should like to see here would be a great flower-garden, similar to those which ornament many foreign towns. The fact that it is slightly above the level of the street and of Bryant Park would give a better chance for good results in this direction. The space could be laid out with broad, straight main walks, and minor ones, either straight or harmoniously curved, to form grass-plots of graceful outline. Then the main walks might be planted with avenues of small trees of a single kind, and symmetrical groups of shrubs could be formed on the borders which would have a succession of flowers throughout the season. The lawns could be edged with long narrow beds of hardy flowers, which we have often described under the name of French Parterres, and in appropriate situations, such as at the intersections of the paths, could be placed pattern beds of the most brilliant hues. This would make a pleasure-ground unique in this city and admirably adapted as an ornament to the avenue and a delight to the eyes of the public. It is constantly insisted by those who wish some excuse for the intrusion of formal flower-beds into pastoral landscapes that the public like nothing so well as flowers. In one sense this is true, and such a space as this would furnish an excellent opportunity to offer flowers in profusion, and also in a most beautiful and appropriate way. Of course, other things would be needed besides the planting of flowers to make the most of this opportunity. The cheap railing on its boundary should be replaced by a handsome stone balustrade, over which the interesting panorama of the avenue could be watched from appropriate seats, and beyond the main central entrance a sculptured fountain could lift its constant streams of water, while minor fountains or beautiful statues could be placed here and there.

There is no good reason why a garden of this sort could not be made one of the most attractive and artistic spots in the city. Indeed, some surroundings of the character found here are essential to decorative gardening of the best type. The canons of good taste would exclude such rigid and geometrical planting from landscapes like those in Central Park, because it would be impossible to reconcile such an artificial work with the free and natural design of the park. The two motives would inevitably conflict with and contradict each other. A flower-garden in a stretch of greensward would interrupt its unity and rob it of the breadth and repose, which are its highest charm. And, on the other hand, an expanse of turf with an irregular border of shrubs or trees would make a peculiarly inappropriate setting for a formal flower-garden, and neutralize to a great

extent its beauty of form and color. But a geometrical design is not injured, but improved, by confinement within the straight lines of streets and blocks of buildings, and areas with such sharply defined, rectilinear boundaries furnish unequaled opportunity for the display of decorative garden art. The floral flags and banners and pictures, with which too many of our public parks have been adorned, are simply abominations. But if some artist with genuine creative faculty and a refined sense of color could be found to make a design for strictly ornamental planting, as distinguished from natural planting, adapted to the area where the reservoir now stands, he would confer a boon upon New York, and offer an object-lesson well worth study and imitation by other cities.

The Sugar Maple.

WE have already published an illustration of a New England Sugar Maple, but good tree-portraits are not so abundant that an apology is needed for offering the one which appears on page 175. This Maple, too, is a universal favorite among our native trees, and one which planters never tire of using and no one ever tires of seeing in northern fields and waysides where it is at home. When it is young the Sugar Maple, although it is always a clean and thrifty-looking tree, lacks something of dignity and individuality. It is the general habit of this tree, instead of forking into large limbs, to throw out from a central stem many comparatively slender branches, the lower tiers of which rise at a slight angle above the horizontal, while those of successive years become more and more upright. As these branches grow out to about the same length with abundant foliage at their extremities, they form a tree of perfectly symmetrical contour, usually egg-shaped, and although the foliage is bright and cheerful its smooth and regular surface presents too little variation of light and shadow. These long and slim branches are easily moved, however, so that the tree has a sprightly and almost sparkling appearance in the sunshine when its leaves are stirred by the gentlest breeze. As it grows on to greater size, and the extremities of these numerous branches are farther apart, breaks begin to appear in the masses of foliage, and here and there some one of these lateral branches will assert itself and outgrow its neighbors until the entire outline of the tree is changed. The top often becomes broad and nearly flat, the sameness of the contour vanishes, and deep shadows give it a dignity of expression which it altogether lacks when young.

In the illustration the tree on the right has passed its prime, as can be seen by its comparatively scant foliage, which opens so as to show its main stem. Dead limbs also appear at the summit and on some of the longer side branches. Trees which are standing alone in pastures often die before their time, because cattle resort so much to their shade, and trample the ground beneath their branches. Very often, too, they are struck by lightning. Sometimes a shock of this kind is apparently slight, and the stricken tree seems at first to suffer no harm, but generally, after lingering a year or two, it dies outright.

The more distant tree on the left of the picture, and apparently a larger one, is still in full vigor, and represents an admirable specimen of its kind. It is growing on lower land, and, probably, has been better supplied with moisture than the one on the little hillock.

The Sugar Maple is a beautiful tree at all seasons. In early spring, when the greenish yellow flowers suddenly burst forth with the first leaves, the tree has an appearance altogether distinct from that presented by any other. Standing in the sunshine, a tree in full flower seems enveloped with a luminous mist, and is an object of striking beauty. Later in the season, its light green and very abundant foliage give it what has been aptly termed a peculiarly sunny expression, and it stands for the very type of cheerfulness among trees. In the autumn none of our trees blaze with brighter or more varied colors, and in the winter its light, ash-colored bark is a pleasant relief from the more sombre hue of other native trees.

We have nothing to add here to what we have often said about the value of this tree for timber and for fuel, and for its sugar product, but merely wish to say, that it was a sagacious popular instinct which selected this as one of our best trees for ornamental planting, and that few trees can excel it in situations where it will thrive. In some of the old places on the Hudson River long avenues were planted with it, three-quarters of a century ago, and some of them are now worth a long journey to see.

How We Renewed an Old Place.

III.—A BABY FOREST.

WE know that mothers love best those children who give them the most trouble, and it must be on some such principle that this barren hill-side of ours wins our best affections; for, as we cultivate its seemingly thankless surface, while it disappoints and resists our loving efforts, all the more there grows in us a tender comprehension of its hidden beauty, a wider sense of its possibilities, and a greater patience with the slow processes by which it is to be restored to vigor and productiveness.

We sympathize with its struggle for self-adornment, poor, barren, ugly thing. The cold, northern slope comes slowly to life, turned away as it lies from the fostering sunlight. When the plain and swale are bright with the hues of spring, the uncut grass upon its side is still brown and withered; it seems to dread awakening from its winter sleep, but at last it begins to star itself over with blossoms of white Saxifrage, and anon it grows purple with Bird's-foot Violets, sending out in the sunshine that soft, fleeting perfume which is a hint of the riper fragrance of their English cousins.

At this season, too, the exquisite wild Columbine decks it with earrings of coral and gold, which the country children call meeting-houses from their steeple-shaped horns, and over it the all-pervading Daisy waves its white and yellow blossoms sturdily in the wind, while the wild Briers put forth their roses, and the Dog's-bane its fragrant cymes, till the Golden-rods and Asters come at last to hide its barrenness with their royal splendor. And all the while there are short, thin grasses, of tender greens and browns, clothing it humbly, while spots of vivid emerald moss indicate the presence of hidden rivulets that feed a living spring that lies at its foot.

In this spring is the possibility of a water garden, of which there is already a beginning. All summer long you can see shining there the blue eyes of great Forget-me-nots, the seeds of whose forebears were brought, long ago, from stately Fontainebleau by a gentle artist, who planted them by his own brook-side, whence they have overrun and made famous the Hingham Meadows, their bright blossoms, like scattered fragments of the sky, gleaming among the rushes, and affording a valuable industry to the small boys who sell them at the railway station as you pass. In addition to these continuously blooming flowers, there are Pussy Willows and white Violets in the spring, and in the late summer the Arrowhead lifts its sculpturesque blossom and fine outlined leaf from the water, and the Cardinal-flower uprears its scarlet spikes amid the blossoms of stately grasses. Some day we hope to see a Pond Lily asleep upon its surface, and if the Lotus-flower would but brook our rigorous winters, we should add one to the collection.

At the foot of the hill, at each end, is a clump of White Birches, ladies of the woods that have strayed from their home, and lost themselves on this waste, and rustle their thin leaves timorously, bending their slender white stems as the sea-blasts strike them. Now that we have stopped mowing and pasturing, we find clumps of Bayberry and Choke-cherry bushes coming up under the tumble-down old rail-fences between us and our neighbors, so that these last are already high enough to shade the boys when, tired and hot with play, they throw themselves upon the ground under their grateful protection. For on the summit of the hill there is level space enough, inside our line, for a tennis-court, from which you can look for a mile across the meadow to the tree-clad hills beyond, and the clustered houses and masts of the harbor, half-buried in trees, and seek for the blue line upon the high horizon that indicates the sea.

Straggling paths, worn by careless feet, lead up the hill-side in those pleasant, meandering ways that indicate the foot of man, and, in imagination, we see them shaded by the Birches

and Pines that we have hopefully planted along the borders; for, in moving our trees with the surrounding sod, we usually brought along these close companions—the Pines and Birches being so married, in most instances, that it seemed a cruelty to separate them.

Hope and faith are qualities that find splendid exercise in tree-planting, and no pursuit can be more unselfish; for, as we watch the tardy growth of our plantations, it is with the stern conviction that other eyes than ours will see the waving of tree-tops above them, and far younger feet that will tread the fragrant woodland-ways when they are at last carpeted with Pine-needles. It is by this spirit that we become one with Nature, sharing humbly in her patience, in her vast unending plans, in her bountiful provision for the future. What better boon to the race can a man leave than a wood that he has planted, in which a future generation may walk and bless his name? Or, if the name be forgotten, there shall abide the forest-blessing, ever beneficent, the mother of springs that fertilize the plain, a shelter to the weary, a delight of the eye, a source alike of profit and pleasure while it endures.

We have friends who scoff when we take them to walk in our forest, and beg them not to step on the Oaks; but, to us, these tiny seedlings, so feeble and unimportant, are personalities that we have cherished through successive seasons, feeding them when hungry, giving drink when dry, grieving when their tender leaves, scorched by too fierce a sun, withered and fell, and rejoicing when, under the cool rains of September, their little bare stems put forth fresh crowns of leaf-buds. Much comfort can be taken in the fact that an Oak once rooted will not wholly perish, but some day conquer even the most obdurate of soils. Like good seed sown in the heart of a child, the storms and sunshine of the world may seem for a time to wither the plant to the ground, but in the end the beauty and power of deep-rooted character will prevail and bear fruit.

We have in our experiments endeavored to make use of such materials as lay at hand, though well aware that nurseries and gardens could have helped us on our way more rapidly. But dealers in trees are expensive luxuries, and our object has been partly to see what can be done without much money, and with only a moderate amount of labor. Our experience has shown us, what the books on forestry told us in the beginning, that sowing seeds and nuts is far less satisfactory than transplanting small trees; but we have had the entertainment of proving their statements for ourselves, and find our compensation in such trifling results as we have achieved. The Pine-seeds, which we shook from the cones in the autumn, and planted before they had time to dry, came up profusely enough in little clusters, but so tiny and weak, that it is wonderful that they are ever discovered even in the thin grass of the hill-side, which we leave near them to afford shade. They make, under these conditions, a sturdy little growth so long as the weather is cool and moist, but are apt to disappear altogether in the month of July. Any small tree, that one can pull up by a wayside, will make better returns for a little attention than these slow-growing mites from seeds.

Such White Birch-seed as we have sown, either because we did not know when to gather it, or whether it came from the wrong tree, has failed to come up at all; but in the sandiest and most uncomfortable part of the hill we find little seedlings that have come up of themselves from the trees at the foot, so that we are fain to confess that Nature understands her business better than we do.

The very small Pines, a few inches high, of which we have set a large number on the rear of the hill, do not grow as well as the larger ones, and are more apt to die. So far our experience leads us to prefer good-sized trees of all kinds for transplanting, rather than small ones, the larger tree seeming to have more vitality to come and go upon until new roots are formed, and it has become adapted to its new conditions.

We have planted various kinds of acorns in great profusion, but the Mossy-cup and the Chestnut Oak seem to thrive best in this waterless soil. The White and Red Oaks seem to require enriching to hold their own at all, and Maple seedlings, which come up promptly, yield to the first drought, though very small transplanted trees live on. Hickory-nuts, though slow in growth, are not vanquished by the conditions, and little yearling Chestnuts, transplanted and dug about, flourish bravely.

From a friend in town whose English Walnut-tree has borne profusely after the recent warm winters, we have obtained fresh nuts, which, promptly set, have germinated and given us fine little shoots in one season. This tree is a more rapid grower than any of our native nut-trees, and so far has stood the winters, but we have had no weather below zero here since 1887, and cannot answer for the effect of an old-fashioned winter. The field mice have a great predilection for them, and gnawed our largest one down to the root a year ago, but it came up again in the spring with redoubled vigor, and made up for lost time.

Small Beeches, dug up by the road-side, and put into holes prepared for them in the side of the hill, have thriven without much attention, and make a favorable growth; but some Ailanthus-trees from a nursery, in spite of Horace Greeley, have refused to do anything at all. In the swale at the foot of the hill, where the soil is deep and moist, all trees flourish. English Oaks grow rapidly from acorns, and we have a fine group of Chestnuts, transplanted when fifteen feet high, that grow superbly after being cut back sternly when set. Though much beset by insects, they are now firmly established, having been planted in the autumn of 1888. In this same moist, rich soil we have also had very good success with that difficult tree to move, the Hemlock; and the Tulip-tree and the Mulberry also flourish, though the tender young branches of the latter suffered after the last two warm winters, dying back badly. How they will have borne this moderately cold one remains to be proved.

Hingham, Mass. *M. C. Robbins.*

The Sap and Sugar of the Maple-tree.—I.

IN October, 1890, and January, 1891, *The American Anthropologist* published two interesting papers—one on "The Indian Origin of Maple-sugar," by H. W. Henshaw, and the other on "The Maple amongst the Algonquins," by A. F. Chamberlain.

These accomplished investigators have thus opened up a new subject of Forestry which may interest some readers of Garden and Forest. They recognize the really sedentary condition of the various Indian tribes, and the fact that, while their supplies of animal food were derived from fishing and hunting for animals and men, they really depended for their daily bread more upon the fruits of agriculture carried on by the Indian squaws than on any other single source. So skilled were they in cultivating the staple grain of America, the priceless maize, that the early colonists were their willing pupils in learning the art; and to these Indian savages, in many times of famine and distress, the colonists on all the Atlantic coast were obliged to appeal for supplies of corn from stores garnered up in sacks, or baskets and boxes made from the bark or wood of forest-trees, or in holes in the ground.

However little practical interest the result of this inquiry may have, it has been thought of some importance to the student of history to know what point upward the Indian race had attained in the arts of common life and in the chemistry of nature as related to their food-supply.

From the great knowledge of the Indian as to all edible products of America, as he had often to draw a part of his subsistence from the bark and wood of trees, the *a priori* presumption of the discovery of the properties of Maple-sap by him is, as stated in these papers, entirely in his favor; yet the question of fact is to be finally decided by appeal to two classes of evidence, the historical and the linguistic, and the two corresponding lines of argument. The rarity of specific reference in the early annals of discovery to the making of sugar by the Indian is accounted for by several causes, among which is the fact that the earliest navigators and explorers were seldom chroniclers. Coming to new shores peopled by savages, they rarely went far into the interior. They generally lived on their ships, or, if on shore, drew from the ships their supplies; while the great staples of such trade as they sought and could carry on with the natives were almost wholly furs of various kinds, and fish.

The shores of the sea and the tidal streams were not the common home of the Sugar Maple. And so far as the forests were concerned, the aspirations of these bold navigators were more than satisfied by the majestic Pines for masts and spars, the other splendid timber-trees for building ships, and the rich sources of turpentine and tar which everywhere met their eyes. Besides this, their passion for conquest often led to fierce contests with one another for territorial aggrandizement, so that little heed was given to questions of plants or food-products on shores where at almost every step they were liable to meet a savage barbarian, or a but little less ferocious wild beast.

On the other hand, the missionaries, to whose habit of writing we are indebted for many of the early notices of trees and fruits, were in no respect naturalists, and their descriptions of natural products are extremely incomplete, as well as few and far between. The very early records are indeed few, but careful research has been rewarded by the statements of Lescarbot,

Le Clercq, Denys and Boucher, which are earlier than any noticed in the *Anthropologist*, with the exception of Sagard's. Yet, that readers of Garden and Forest may know the character of the evidence which exists, a résumé of the statements of the principal authorities adduced is given, mainly in chronological order, the quotations having been verified by reference to original works.

The earliest record the writer has yet found is that of Lescarbot (1606–7), a lawyer of Paris, who from love of adventure came to New France as a friend of Poutrincourt in 1606. He gives some description of the New World and its Indians, tells of their great endurance, and explains the resource they found in the sap of trees for refreshment and strength in their hunts and long journeys through the forests. He says:

"Ils aussi . . . entreprendont d'aller vingt, trente et quarante lieues par le bois sans rencontre ni sentier, ni hotellerie & sans porter aucuns vivres. S'ils sont pressez de soif ils ont l'industrie de succer les arbres, d'ou distille une douce et forte agréable liqueur, comme je l'ai experimenté quelque fois."*

That Lescarbot refers here to the sap of the Maple-tree there seems no reason to question, as in the summer of 1606 he met with Erables (*Acer rubrum*) and Sycamores (*A. barbatum*) in the forests around Port Royal.†

The declarations of Père Sagard (1623–29), when with the Hurons, as to the use of the sap of trees, are to the same effect. He says:

"Au temps que les bois estoient en sêve nous faisions parfois une fente dans l'escorce de quelques gros fouteau, et tenans au dessous une escuelle, nous recevions le jus et la liqueur qui en distillait, laquelle nous servoit pour nous fortifier le cœur lorsque nous nous en sentions incommodez."‡

Sagard also expressly confirms the statements of Lescarbot as to the use by the Indians of the sap of trees to restore their strength and relieve their thirst when on expeditions through the forests, and affirms the adoption of this custom by the French themselves when the trees were in sap.§

Monsieur Nicolas Denys, Gouverneur, Lieutenant-Général pour le Roi (1634–1671), thus writes of the Maple:

"L'Erable est encore un bon bois: . . . cet arbre-la a la sève differente de tous les autres; ou en fait un boisson tres-agreable à boire, de la couleur de vin d'Espagne, mais non si bonne; elle a une douceur qui la rend d'un fort bon goust, elle n'incommode point l'estomac, elle passe aussi promptement que les eaux de Pougues; je crois qu'elle serait bonne pour ceux qui ont la pierre. Pour en avoir au Printemps et l'Automne que l'Arbre est en sève, l'on fait une entaille profonde d'environ un demy pied, un peu enfoncée au milieu pour recevoir l'eau, cette entaille a de hauteur environ un pied, et à peu prés la mesme largeur; au dessons de l'entaille à cinq ou six doigts on fait un trou avec un vrille-brequin qui va répondre au milieu de l'entaille où tombe l'eau: on met un tuyau de plume ou deux bout à bout si un n'est assez long, dont le bout d'en bas répond en quelque vaisseau pour recevoir l'eau; en deux ou trois heures il rendra trois à quatre pots de liqueurs. C'est la boisson des sauvages et mesme des François qui en sont friands."‖

Pierre Boucher (1663), Gouverneur des "Trois-Rivieres," who dedicated his work to Monseigneur Colbert, Intendant des Finances, says, in writing of the trees which grow in New France: "Il y a une autre espèce d'arbre, qu'on appelle Herable, qui vient fort gros et haut. . . . Quand on entaille ces Herables au Printemps il en degoutte quantité d'eau, qui est plus douce que de l'eau détrempée dans du sucre; du moins plus agreeable à boire."¶

After Boucher, Père Christien Le Clercq, a Recollect Missionary (1675–91), relates the experience of the missionaries in the use of Maple-sap. He says: "Nos viandes ordinaires estoient de même que celles de nos sauvages, c'est-à-dire de la Sagamité fait à l'eau avec de la farine de bled d'Inde; des citrônilles et des pois, ou nous mellions pour y donner quelque goût, de la marjolaine, du pourpier, et d'une certaine espece de baume, avec des petits oignons sauvages que nous trouvions dans les bois, et dans la campagne. Notre boisson était l'eau de ruisseau, qui coulait au pied de nôtre maison, et si dans le temps que les arbres étoient en sève quelqu'un de nous se trouvait indiposé, ou ressentoit quelque debilité de cœur nous faisons une fente dans l'écorce d'un erable qui distilloit une eau sucrée qu'on amassoit avec un plat d'écorce, et qu'on beuvait comme un remede souverain; quoi qù á la verité, les effets n'en fussêt bien considerable."*

Père Le Clercq in another work is more explicit, and says: "Quant à l'eau d'erable qui est la sève de l'arbre même, elle est egalement délicieuse pour les Français et les Sauvages qui s'en donnent au Printemps à cœur joie. Il est vrai aussi q'elle est fort agréable et abondante dans la Gaspasie, car par une ouverture assez petite, qu'on fait avec la hache dans un érable, on en fait distiller des dix ou douze pots. Ce qui m'a paru assez remarquable dans l'eau d'érable, c'est que si à force de la faire bouillir on la reduit au tiers, elle devient un veritable syrop, qui se durcit à peu prés comme le sucre, et prend une couleur rougeâtre. On en forme des petits pains† q'on envoie en France par vareté, et qui dans l'usage sert bien souvent au defaut du sucre Français. J'en ai plusieurs fois melangé avec de l'eau de vie, des clous de girofle et de canelle; ce qui faisoit une espece de rossoli fort agreable."‡

Providence, R. I. *William D. Ely.*

* Lescarbot, Lib. vi., Cap. xvi., p. 865. Paris, 1618.
† Lescarbot, Lib. iii., Chap. xxiv., p. 852. Paris, 1609.
‡ Sagard, "Le Grande Voyage du Pays des Hurons," pp. 102–3 Paris, 1632.
§ Sagard, idem., p. 126.
‖ Histoire Naturelle des Peuples, des Animaux, des Arbres et Plantes de l'Amerique Septentrionale, Vol. ii., Chap. xx., pp. 316-7-8. Paris, 1672.
¶ Histoire veritable et naturelle de la Nouvelle France, 44-5. A Paris, 1664.

New or Little Known Plants.

Lælia anceps, var. holochila.

AMONG the multitude of varieties of *Lælia anceps* which have at different times appeared I have never before met with one having a perfectly entire lip, as has the present one. Indeed, the aspect of the flower is so different that, apart from the plant, it is doubtful if it would be recognized by many people as belonging to *Lælia anceps* at all. Early in the present year a single flower was sent to me by the conductor of Garden and Forest, from the collection of Mr. F. L. Ames, of North Easton, Massachusetts, with the information that the plant was purchased in June, 1888, from the Liverpool Horticultural Company, with a batch of other plants, as *Lælia anceps morada*, and that, with this single exception, the lot proved true to name. It flowered for the first time in December, 1889, carrying two spikes, and again the following year with five spikes. The plant has thirty bulbs and six leads. My first knowledge of this variety dates from December 7th, 1889. On that morning two flowers arrived from two different sources. One was from the Liverpool Horticultural Company, with a note from Mr. John Cowan, the manager, that it was a very distinct variety, at first sight looking like a deformed flower, but that there were two plants with flowers exactly alike. The other flower came through Messrs. Hugh Low & Co., of Clapton Nursery, who had received it from Mr. W. Sherwin, The Gardens, Asmaston Manor, Ashbourne.

Mr. Sherwin remarks that when the first flower opened he thought it some accidental freak, but a second plant on flowering proved exactly the same. A little later a pseudobulb and leaf were sent, also a peduncle, all of which were quite normal in character. The peculiarity of this variety is almost confined to the lip, which is elliptical-lanceolate in shape, over two inches long by three-quarters of an inch wide, and more like a petal than a lip. It is, however, different from the petals, both in shape and color, being light purple, with a nearly white disc, and some yellow at the base, while the petals are almost identical with the sepals in shape, and all pale lilac in color. The column is nearly, but not quite, normal. I believe this variety represents a peloriate condition of the plant, which has become fixed or permanent, and thus bears the same relation to *Lælia anceps* that *Uropedium Lindenii* does to *Selenipedium caudatum*. That the peculiarity has become fixed seems pretty evident, but whether it could be reproduced from seed is rather doubtful. I do not know the origin of Mr. Sherwin's plants, but should not be surprised to find that the whole of the plants under mention are subdivisions of one original clump, and from the same importation. If, however, we must consider it a monster, it is only such in a botanical sense, for it is a decidedly handsome garden-

* Etablissement de La Foy. Par le Père Christien Le Clercq, Vol. i., 252-3. A Paris, 1691.
† It is brought into Quebec to-day in "petits pains" and little cornucopias of birch-bark.
‡ Nouvelle relation de la Gaspesie, Chap. vi., 124-5. A Paris, 1691.

plant, and the most distinct, if not the rarest, variety of *Lælia anceps* in existence, and a marked contrast with the ordinary form.

Kew. *R. A. Rolfe.*

Foreign Correspondence.

London Letter.

Snowdrops.—At a late meeting of the Royal Horticultural Society these plants were the subject of three papers, prepared by Mr. F. W. Burbidge, Mr. Allen and Mr. Melville respectively. Mr. Burbidge's paper was historical and botanical, the other two dealing chiefly with the horticultural aspects of the genus. Of course, the accepted botany of the Snowdrop, as indeed of all Amaryllidaceous genera, is that of Mr. Baker, of Kew, who describes six species of Galanthus in his book, viz.: *G. nivalis*, *G. Græcus*, *G. Elwesii*, *G. latifolius*, *G. Olgæ* and *G. plicatus*. To those must be added the newly described *G. Fosteri* and *G. Alleni*. The commonest, and, taken altogether, the best of all these, is *G. nivalis*, which is wild in the meadows and copses of England, and may be established almost anywhere. It varies somewhat in the size, form and marking of its flowers, a considerable number of varieties having distinctive names, such as reflexus, lutescens, poculiformis, octobrensis, Imperati, Redouté, etc. I confess to being somewhat blind to the distinctive characters of many of these varieties. Plant them all side by side, and they present no difference to the ordinary eye.

Fig. 31.—Lælia anceps, var. holochila, Rolfe.—See page 172.

Mr. Allen, who is the first authority on garden Snowdrops, considers *G. plicatus maximus* the best of all. The type is a native of the Crimea, whence it was introduced into England at the time of the Crimean war. The variety originated, I believe, in Mr. Allen's garden. It flowers later than the common Snowdrop, and has larger flowers. Of *G. Elwesii*, Mr. Allen has not so good an opinion as other growers have. It certainly is a bad species to cultivate, dying out if planted in ordinary beds, or deteriorating so much as to be inferior in size to the common kind. At its best it is a handsome Snowdrop, the flowers being large, globose, and of the purest white. *G. latifolius* has larger leaves and smaller flowers than *G. nivalis*. The new *G. Fosteri* has disappointed many who had been led to believe that it was larger in flower, more elegant in form, and in other respects superior to all other Snowdrops. At Kew it has not even equaled some of the forms of *G. nivalis*. Its fragrance was scarcely perceptible. Possibly it may improve after it has become established, though, as a rule, Snowdrops are better the first year after importation than afterward. *G. Fosteri* is named in compliment to the eminent English physiologist, Dr. Michael Foster, who introduced this species from central Asia Minor. *G. Alleni* has been described as "the finest of all Snowdrops." Mr. Allen says it is "nearer to *G. latifolius* than to *G. Caucasicus*, but the foliage is different in color, and the whole plant is much larger. It grows very robustly and flowers very freely. It is one of the most distinct Snowdrops I have, and my friends to whom I have sent roots speak very highly of it." Mr. Allen interests himself in the crossing of the different species of Galanthus with each other, and although, as I have already said, we have nothing better than the true "Flower of our Lady," the common *G. nivalis*, better may yet be obtained. It is stated that Herr Max Leichtlin knows of a pink Snowdrop in Armenia which he will no doubt obtain, if any one can. Let us hope that it is a better pink color than the so-called yellow Snowdrop is a yellow. Rumor has it that in a certain cottage garden in England there is "a colony of Snowdrops with bright yellow flowers!" Possibly these wonders belong to the same category as the Blue Chrysanthemum and Crimson Daffodil.

Mr. Melville's paper was full of practical hints, and the photograph exhibited by him of a wood carpeted with Snowdrops at Dunrobin Castle showed how effective these plants are when planted in grass under trees. It is not every garden that suits Snowdrops, but where the soil proves suitable they ought to be planted under trees on lawns, and in all such places as would be beautiful if studded with the pretty flowers of the first herald of spring. By the way, I may note that, instead of February, March has been the Snowdrop's month in England this year.

Max Leichtlin on Hardy Plants.—The renowned horticulturist of Baden-Baden does not often express himself at any length on the cultivation of plants. The announcement of a paper by him, to be read at the last meeting of the Royal Horticultural Society, was therefore sufficient to attract many of those who take a special interest in that class of plants with which Herr Max Leichtlin has always been prominently identified, namely, hardy herbaceous and alpine plants. The paper consisted of concise practical observations on the behavior and peculiar requirements under cultivation of hardy bulbs, plants, primulas, and the choicer alpines. The writer recorded his own experiences and views derived from them. Of course he would admit that many cultivators of hardy plants meet with success by following other methods, often very different methods too, from those which prove suitable at Baden-Baden. There are fifty roads to town, and often as many to success in the cultivation of any given plant. Any one who reads the cultural directions of trustworthy practitioners will have noted this fact.

Max Leichtlin begins by stating that to imitate the natural conditions in the growth of hardy plants is the first step to success. To this the obvious reply is, that it all depends on what the natural conditions are, and the cultivator's resources. He does not believe in the possibility of acclimatization for plants, although many people still have faith in it. That many plants prove hardier when under cultivation than they appear to be in a state of nature only proves their elasticity. An example of how easily one may be deceived by the behavior of plants was seen here lately, in the effects of frost on some seedlings of *Clematis Stanleyi*. The seeds had all been obtained from south Africa. About fifty of the seedlings were planted, last summer, on a south border at Kew, where they grew well and flowered, nothwithstanding the unfavorable weather here last summer. The first severe frost killed the leaves of all the plants except three, which remained uninjured; nor were these three hurt by the cold which killed

all the others down to the ground. It is easy to see how the behavior of the three hardier seedlings might have been misinterpreted under treatment of a different kind from that which they received.

Max Leichtlin mentioned *Calandrina umbellata*, a native of Chili, which never experiences frost in nature but bears at least seven degrees at Baden-Baden. *Zephyranthes candida* is still more remarkable, for, while it is found wild only in the low, moist plains of the La Plata, the other species of Zephyranthes being always on the hills, under cultivation in England it is as hardy as a Snowdrop, and is the only one that can be grown out-of-doors.

On the question of seed-sowing, Max Leichtlin made the following suggestions: The seeds of all hardy plants germinate more quickly and give better results if sown as soon as they are ripe. It is, of course, often convenient, and even necessary, to keep many seeds until the spring before sowing. Hard-shelled seeds, he said, must be sown at once. I confess I do not see the necessity for this. As a rule, seeds with a hard shell are easily kept; they lose nothing by being kept, and they germinate freely if soaked in hot water before being sown. Seeds with oily albumen are, of course, an exception to this rule. Immediate sowing is also recommended for seeds of all bulbous plants as soon as ripe. Delay in the case of seeds of Lilies, Fritillarias, Tulips and others means the loss of about eighty per cent. of the seeds. The same rule holds good in the case of Campanulas, or the seeds will lie dormant a whole year. All bulb seeds, except those of Gladioli, should be buried an inch deep, says Herr Leichtlin.

The seeds of Himalayan Primulas take three weeks to germinate unless exposed to a shower of rain after they have been sown a few days, when they will germinate in twenty-four hours. Others entirely lose the power to germinate if allowed to get dry. I have found tropical treatment, such as one gives to the seeds of Gloxinias, expedite the germination of such seeds as *Primula imperialis*, *P. Poissoni*, *P. prolifera*, *Ranunculus Lyallii* and other sluggish hardy alpines.

It is surprising how soon a high temperature with moisture induces germination in such seeds. *Victoria regia*, which, sown in a temperature of eighty-five degrees, takes a month to push through the hard shell, may be made to germinate in about three days if sown in water at a temperature of 160 degrees Fahrenheit. The seeds must be removed to a lower temperature as soon as the plumule appears.

Max Leichtlin believes much in the influence of frost on the vegetation of seeds. Even those of such plants as Kniphofia and Tecophylœa germinate more freely by exposure to frost for a time after sowing. Soft, pulpy seeds, unless quite hardy, should not be treated in this way. All bulbous seedlings should be left in the seed-pan at least a year.

Turning to the plants, he said all those with hairy or spiny leaves require a dry sunny position. Nearly all Primulas are happiest when planted in cool, shady spots. Hellebores thrive best if exposed to full sun in winter, full shade in summer. Manure was spoken of as the curse of the alpine-garden. According to Max Leichtlin, no rock-plant should have manure, which may be true at Baden-Baden, but the reverse at Kew, as well as in many other gardens. Nor do we find that most bulbs grow equally well in light or heavy soils. Of course the terms light and heavy are vague, but there are very many hardy bulbous plants as well as tender the behavior of which in light sandy loam is much less satisfactory here than in rich buttery loam. Max Leichtlin advises that no manure should be given to newly imported bulbs. I presume he meant only those bulbs which have suffered much through exposure and drought, as this cannot apply for Lilies, Tulips, Hippeastrums, Narcissi and many other bulbs which are largely imported annually. Most of his herbaceous borders, he stated, have had no manure for ten years. This says much for the excellent quality of the soil in his borders. All sick bulbs are recommended to be lifted, washed and thoroughly cleaned, and replanted in virgin soil. *Lilium candidum* is invariably ruined if dosed with manure. Fritillarias are naturally lime-loving plants, but at Baden-Baden they thrive in a soil quite free from lime. The American and Himalayan species like a somewhat shaded position.

The plants which received special notice at the meeting were the following: *Saxifraga Boydii*, a hybrid between *S. aretioides* and *S. Burseriana*, raised by Boyd, of Kelso. The latter parent is one of the most beautiful of all cultivated Saxifragas, both as a pot plant and on the rockery. *S. Boydii* is exactly like it, except in the color of its flowers, which are soft primrose-yellow.

Chionodoxa grandiflora.—This is merely a variety of *C. Luciliæ* with fewer flowered racemes, and flowers a little larger than in the ordinary forms of the type. It was previously called *C. gigantea*. There is a tendency among dealers to overname these little hardy plants, Chionodoxas having suffered a good deal from too much attention of this kind.

Azalea mollis, vars. *Mecene* and *Norma*.—These are semi-double varieties, good in habit, free-flowering, and the flowers decidedly pretty. Mecene promises to be a really useful plant for early forcing, as the flowers are white, with the faintest tinge of yellow on the outer segments, and they would meet with favor on account of their elegance and substance. Norma is of similar character, but the flowers are orange-red.

Other exhibits which received awards were Camellia Beauty of Waltham, a perfect double flower with blush-white petals; *Arum Palestinum*, an old garden plant which is hardy in some parts of England. It has a large black purple spathe and spadix, and grows to about eighteen inches in height. This plant is frequently sent to Kew by tourists in the Holy Land, who imagine that they have discovered something new. It was offered a year or two ago under the alluring name of *A. sanctum*.

London. *W. Watson.*

Cultural Department.

Calatheas.

UNDER this head are included some of the best foliage plants for warm-house culture, as well as some that will succeed in moderate temperature. They are a moisture-loving group, and are doubtless found in the condition of undergrowth in tropical forests, the majority being natives of either Central or South America.

The few species referred to here are all well worth cultivation in the most select collection, and possibly may be more readily recognized by some readers as Marantas, since most of them were originally sent out under that name. Many of the Calatheas, or Marantas, prefer warm treatment, in order to develop their beautifully marked leaves to perfection, and during the summer they also require shading, as the foliage of most of them is quite tender. In the matter of soil, a rough open mixture is preferable, and in potting it is best not to press it down too firmly, else the roots do not easily penetrate it. The drainage of the pots should also be looked after with care.

By the term "warm treatment" is meant a temperature of sixty-five to seventy degrees at night, with plenty of moisture both in the atmosphere and at the roots of the plants, and while such treatment will be congenial to many of the Calatheas, yet there are some that can be successfully grown under very different conditions. The propagation of these plants is effected by division, and about this season of the year is a good time for this operation, though it may be performed at almost any season, if done with care. Spring or early summer is also the most satisfactory time for repotting the plants, even though the increase of stock is not desired.

C. Veitchii, a plant of strong growth and very beautiful foliage, is one of the best of the genus. It attains a height of three feet or more, the leaves being ovate in form and standing almost upright, while in color they are dark, glossy green, with several crescent-shaped blotches of yellow on each side of the midrib, which are toned down by various shades of green and white. The under side of the leaf is light purple, and this adds to the rich effect of the whole.

Another charming species is *C. Makoyana*, which is also beautifully marked, though quite dwarf in habit. The leaves of this plant are thrown up on slender foot-stalks to a height of about one foot, and are oblong, with somewhat unequal sides. The outer margin of the leaf is dark green, and the centre semi-transparent and marked with yellowish white, in which the veins show quite prominently. When well grown this is a remarkably pretty plant, and is well suited for collections where space is an object.

C. fasciata is also a good species, and of free growth. It produces broadly ovate leaves nearly one foot in length and about eight inches wide. They are bright green, with broad bands of white reaching from midrib to margin, and the under side is pale green, flushed with purple.

C. illustris, another distinct species, has ovate leaves of bright green color, marked with bands of deeper green, and also with two irregular bands of white, running from the base to near the apex. The foliage of this species is also quite large, and it is of free growth in a warm house.

C. roseo-picta is one of the most attractive small-growing kinds, with glossy dark green leaves that are nearly round. The midrib is rose color, and two bands of the same color traverse the leaves almost from end to end.

Fig. 32.—Sugar Maples in New Hampshire.—See page 170.

C. tubispatha is more rarely seen. Its leaves are of medium size, pale green, and ornamented with a row of chocolate brown blotches on each side of the midrib. This species is nearly or quite deciduous, but should be taken care of during the winter, in order to keep the tubers in good condition.

One of the best known of this genus is *C. zebrina*, and a very useful one it is too, for it will bear more hardship than any other member of the family—not only making a satisfactory house-plant, but also being useful for out-door work in summer.

C. Vanden Heckei is another easy one to manage, and has erect leaves of dark green, shaded with lighter color, the midrib being margined with white, and two bands of the same are found between the midrib and margin.

Holmesburg, Pa. *W. H. Taplin.*

The Wild Garden.

I HAVE in mind a piece of ground about three feet square which contains fourteen varieties of transplanted wild flowers. They are interesting to watch from the uncurling of the first Fern-frond in April till the Arum drops its scarlet berries in October. In most yards there is a shady corner in which wild plants might be set. The soil need not be stirred, or enriched or changed for leaf-mold. If once or twice in the summer the grass-roots are pulled out it is about all the attention required. Wild flowers are used to "short commons" and to exerting themselves to hold their own. Nature does not see fit to pet or coax them, as so many other plants are always pushing and crowding for a foot-hold. So these wildings get a certain hardy, wiry toughness, though it seems as if the winds must be somewhat tempered to the delicate Spring Beauty. This has a small tuber buried as deep as the height of its stem above ground. It is frail, but bears careful transplanting. The Hepatica or Liverwort, which has hardy leaves, may be found and moved at any time when the ground is not frozen. As early as January the mass of gray downy buds at its heart may be seen. The blossoms have quite a range of color, something unusual in a wild flower. The bright blue is perhaps prettiest, especially when wide open, in the sun, but the pink and lilac ones are of so pure and fresh a tint as never to seem faded. The Bloodroot grows best in rich garden-soil, its leaves and blossoms becoming large and showy. In lifting the plant it should be remembered that its root-stock is at right angles to the leaf-stem. It blooms before the leaves are fully developed. The seeds, of pin-head size, are abundant, and it would be an interesting experiment to plant them.

Of the twenty-two varieties of native Violets only two have been tested in the garden. The Arrow-leaved, found by a dry, hilly roadside, lived only through the summer. The Bird's-foot Violet grows in a fringy clump, as the dark leaves are finely divided even to the stem. The blossoms, in cultivation often over twenty in number, are light blue, shaded to white at the centre, and it is altogether a superior plant. My first sight of it was in a Pine-woods, which it seemed to light up as a line of poetry might a chapter of prose. I have seen it once since growing on a rocky hill-top, from which I dug it and carried it wrapped in wet Oak-leaves a number of miles to my garden, where I introduced it to the Maiden-hair Fern and other select society.

Arisæma triphyllum, or "Jack-in-the-Pulpit," grows amazingly in rich soil, but is really prettier when small. It has a corm or solid bulb, with an extremely acrid taste, and said to be poisonous. This Jack has his time of peering solemnly from under his leafy sounding-board, and then, his message delivered, there goes on all summer a transformation by which he becomes a bunch of shining, scarlet berries. The small, imperfect ones, which ripen in the woods, give no hint of the beauty of a fully developed specimen. One which grew in the garden last year ripened in September, and lasted for a month. It was fourteen inches high, and had sixty berries, each of which contained from one to five large, white seeds, and a few drops of orange-colored juice. The dull crimson receptacle, seen by removing the berries, was covered with depressed scars where the berries joined. Its interior, like the stem, was filled with white, webby pith.

I shall never forget coming upon a great circle of cardinal flowers in full bloom in a moist sunny glade. I gathered a handful, and, showing them to the one on whose farm they grew, I for the first time heard them called "Nosebleed," a name more true than beautiful, and was told of their use in dyeing. By setting a vase of them in a plate of water one may notice particles falling and dissolving a brilliant coloring matter.

Several roots from a river-bank were set in rich garden-soil, which was prepared by wetting, for a foot or more in depth, to the consistency of thick mud. Planted in August, they were well established before winter, and the next year grew on through six rainless weeks with no watering at all. By August the tall blossom-stem showed the brightest color in all the garden. Its top nodded, but it need not have been so modest. But some rushes, accidentally taken up with it, did look out of place standing stiffly by a graceful Columbine. The purplish blossoms of the Wild Bean, *Phaseolus perennis*, are due in August, as are the wild Crimson Pinks. All these, with a Cranberry-vine and varieties of ferns, complete the company of fourteen which live in one little wild garden.

Hartford, Conn. *Amy Wightman.*

The Spring Garden.

SHARP frosts still continue every night to bind the surface of the garden, and, despite the daily advancing sun, there is still much chilliness in the air. Under these conditions the spring garden makes very slow advances. However, one can note, from day to day, continued progress among the hardy plants, and bulbous ones especially are the least influenced by adverse conditions of temperature.

Iris reticulata major—blooming in March—is a noticeable addition to the early-flowering bulbous varieties, and perfectly hardy. The flowers are larger than those of the type, and of a rich deep royal purple, with a spot of yellow on the falls. The falls do not droop as much as the typical *I. reticulata*, thus increasing its apparent size. The flowers of these dwarf Irises are quite persistent, this variety lasting in good form for ten days. *Iris Bakeriana* blooms were in good condition eight days when they disappeared under the snow. In the mean time they had passed through a night when the temperature had dropped to zero without apparent harm. Aside from the beauty of the early spring flowers, there is an unfailing interest in watching, year by year, their development under the various adverse conditions, and one acquires a friendship for them which is stronger and more personal than the regard for those of other seasons. Of quite a different form of beauty is *Iris Persica*, the first flowers of which are just expanded. This is an old variety, not grown as generally as it should be. It is a bulbous variety, placed in the Juno section, and the flowers, white, with purple and yellow markings, appear before the leaves, and are apparently stemless. It seems to be hardy in not too wet locations, and, like most hardy bulbous plants, should be planted early, so as to form roots before winter. Of course the flower-buds are formed in bulbs before they go to rest, and even late-planted bulbs will flower well, but precautions should be used in planting out, and especial care will be necessary if they are grown in pots in a cold frame from which frost is not entirely excluded.

Some of my surprises last winter were losses of *Iris juncea* and *Homeria collina* in pots, while plants of the same are alive in the open. *Ornithogalum Arabicum* potted up was destroyed, while those planted out under the same sash are alive and vigorous. It would seem that in pots, with their rigid sides, frost, for some reason, takes a stronger hold, and is apt to disintegrate bulbs, which, in freer soil, would escape ruin. This fact is probably familiar to professionals, though I have never happened to see it in print, which leads me to say that these small points which every one is supposed to know are exactly the things which interest the amateur gardener and save him from losses and disappointment. Our professional friends, who are kind enough to impart to us a great deal of instruction in their catalogues and the horticultural press, do not seem to realize how little we amateurs know about cultural matters, and how helpful it is to have the simplest hints. But to return to the garden. *Anemone blanda alba*, from Herr Leichtlin, seems a different form of flower from those of the type from Asia Minor, the petals being fewer and blunter. The white is of a more creamy tint than in white forms of the latter variety. One cannot have too much of either, as a bed of these on a sunny day in February and March produces an effect which cannot be secured from any other flowers at that season.

Chionodoxa gigantea or *grandiflorum*, as it is now named, retains its character as a distinct variety. Established plants throw flowers larger than *C. Luciliæ*, and of a more slaty blue, and without the distinct white eye of that variety. A crop of Chrysanthemums were grown over my bed of small bulbs last season, and the condition of the Chionodoxes this spring is a practical example of the folly of expecting to double-crop such a bed without injury to the bulbs.

One always welcomes the Narcissi as the first of the really conspicuous spring flowers, and the first satisfactory for cutting. Trumpet Major is open on the border, and a collection in a warm corner is in all conditions from bloom to apparent dormancy, thus promising a long season. So far the flowers

have appeared in the following order: Scoticus, Henry Irving, Countess of Annesley, Ard Righ, Trumpet Minor, Obvallaris (Tenby).

My collection of Narcissi is so small that I cannot consider myself anything of a specialist in these flowers, in these days of collections with varieties numbered among the hundreds, but I may be allowed to remark that, for ordinary garden purposes, one could select a dozen varieties of Daffodils which would satisfy the wants of the average cultivator, and the cheapest are by no means the poorest. Fortunately, the rage for these bulbs has brought them largely into cultivation, and it is rapidly becoming possible to secure choice varieties at prices within reach of every one. With Daffodils about as cheap as Onions, there does not seem much excuse for not planting them in every spare corner.

Elizabeth, N. J. *J. N. Gerard.*

Lælia anceps Sanderiana.—Of the numerous white varieties of *Lælia anceps* which bloom during December and January, perhaps none is so popular as this. It has only been in cultivation about six years, and, although it comes near the beautiful variety Dawsoni, still it has the advantage over this in being much more common. The flowers are very large, and seem to improve, in size, substance and covering every year, with good cultivation. The sepals and petals are pure white, the latter being very broad in comparison, while the lip has a large white front-lobe, with a deep crimson-purple blotch on it in front of the yellow, ridge-like callus which runs from the base, and on each side of which are radiating, broken lines and spots of rich purple, which give the flower a most charming appearance. It is not uncommon to see from five to seven flowers on one spike, and when several spikes are borne on good plants, one may expect to have a display of beauty for several weeks. After the flowers are cut they will remain almost perfect for about a fortnight.

London. *J. Weathers.*

The Hydrangea Blight.—For about a year and a half the cultivated Hydrangeas, and particularly those growing under glass in the winter, have been troubled with large, rusty-brown blotches upon the leaves. So serious is this blight in some greenhouses that the tops of the plants have been entirely cut away, but even this heroic treatment failed, for the vigorous young growth afterward became as badly blighted as before. In many cases the disease has caused serious losses to those who have been growing Hydrangeas for Easter decoration. This blight is due to Fungus only recently described, and it is known as *Phyllosticta Hydrangeæ*, E. & E. The pest is spread by means of innumerable spores, which are borne in minute pimples that beset the brown areas of the leaf. As it is closely related to the black-rot of the grape, it may perhaps be controlled by the standard fungicide now used on diseased Vines, namely: carbonate of copper dissolved in ammonia water. This note is to suggest a trial of this remedy by those whose Hydrangeas are affected.

Rutgers College. *Byron D. Halsted.*

The Forest.

Prairie Forestry and the Timber Culture Law.—II.

THE requisites of successful tree Culture on the Dakota prairies are: 1, deep-plowed land, thoroughly fined before planting is begun; 2, the use of trees or seeds that are in good condition when planted, and that are set firm, with the roots in moist earth; 3, thorough culture, so that at least until midsummer a crust is not permitted to form on the surface of the soil; 4, perfect maturing of the wood, secured by cessation of culture at midsummer; 5, freedom from grass and perennial weeds. To meet the requisites prompt and careful attention is demanded at a time when the active work of the farm is most pressing. When it is remembered that most of the settlers in our state were poor, and depended on their crops for a living, it will not be wondered at that the one crop which brought no money return, the trees, was most apt to be neglected. When we recall the exacting demands of successful tree-growth, the wonder is not that so many failed, but that any succeeded.

It is not strange that ten years ago, when South Dakota began to secure its great influx of settlers, the people failed to comprehend at once the new climate. They planted as they had done in their former homes. That greater culture was necessary, in order to supplement a decreased rain-fall, was only learned at the expense of many failures, not of trees only, but of all other crops as well. It is unjust to say that the failure of artificial groves in this state was due to universal fraud; it was the result in great measure of honest ignorance. In justice to thousands of worthy citizens, who in the early days of their Dakota residence failed to understand the new conditions by which they were surrounded, the present Timber Culture Act should not be repealed, but should be amended so as to enable them, profiting by the knowledge which nothing but experience could give, to fill out their plantations and by better culture insure the growth of the requisite number of trees per acre.

Additional time will enable thousands of holders of timber claims to satisfy both the spirit and the letter of the law, who without it must relinquish their holdings, and thus lose whatever improvements they have made on the land.

The law itself contains a great element of weakness. Instead of compelling the entryman to begin planting two years after his entry is made, at least twice that time, with the methods of cultivation in vogue in this country, is necessary to properly prepare the soil for trees. By our common practice two years is not sufficient to kill the native vegetation of the western prairies. Extraordinary culture must be given if the planter would have his land ready to receive trees within the time required by law. If trees are planted in land filled with the roots and underground stems of strong prairie grasses no amount of after-culture will enable the planter to secure the growth that moderate cultivation would have insured had the soil been properly prepared before the trees were set. Thousands of tree plantations that will never enable their owners to secure a patent on their land are evidences of honest, though not the most intelligent, effort; and it is right that Government should favor such planters, and enable them to secure titles to their land in some such way as the Dunnell Bill provides, if the present law must be repealed. Every grove in South Dakota, western Iowa, Nebraska and Kansas is the outcome of the one effort of Government to encourage tree-culture. If the law has failed to meet the expectations of its promoters, it has filled for thinking men a higher purpose—it has shown that Government action can aid in checking winds from drying out the plains if it will but use its abundant means and power.

Every year vast sums are appropriated by Congress for the improvement of streams; public money is spent for the improvement of water-powers for manufacturing towns; for erecting magnificent public buildings; for sending Congressional committees to the uttermost parts of the land; and why should not the parched prairies receive a part of this vast largess?

Our representatives in Congress continue to permit, through lack of simple legislation, the wholesale spoliation of the forests of the country. The head-waters of our great rivers are rapidly being robbed of the shade that sustains them. If Congress spends money on our water-ways, why not begin at the fountain-head and reclothe the bare mountain-sides with forests?

Every year adds to the apparent necessity for overcoming the aridity of the western plains. Congress, by its appointment of committees of inquiry and investigation, is beginning to recognize the importance of the subject. Irrigation will do much toward supplying the needed moisture, but the more carefully one studies the conditions the more convincing becomes the belief that not until an adequate forest-growth is maintained on the mountain-sides and where it is possible on the level stretches between them and the great rivers, will this growing problem be satisfactorily solved.

Agricultural College, Brookings, S. D. *Charles A. Keffer.*

[Since the above was written the Timber Culture Act has been repealed, but the argument of Professor Keffer is worth preserving as it stands.—Ed.]

Correspondence.

Sap-sucking Woodpeckers and Forest-trees.

To the Editor of Garden and Forest:

Sir,—In answer to your request, I am happy to state briefly the results of certain investigations made by me into the effects upon forest-trees of the attacks of Sap-sucking Woodpeckers (*Sphyropicus varius*). In an extended article which is to appear in the next number of the *Auk* I describe, from the ornithologist's standpoint, the birds' method of attack and the way in which they use the sap which they drain from various forest-trees. My observations were made near Mount Chocorua, New Hampshire, partly in July and August, 1890, and partly in the two preceding years. The region is covered mainly by conifers, Poplars, Maples, Birches, Oaks and White Ash.

The trees selected by the birds which I watched were Red Maples, Canoe Birches and Red Oaks. In other localities they attack the Mountain Ash, the Black Alder and some other trees and shrubs. The trees chosen are comparatively young, strong, and well exposed to the sun. Beginning about twenty feet from the ground, on a tree of twice that height, the birds drill a ring of small angular holes in the bark to, and, probably in the majority of instances, through the cambium layer. The holes are so cut as to catch and hold small quantities of the descending elaborated sap. In order to maintain a steady flow of sap the birds drill several new holes each day. They also widen such of the old holes as continue moist, sometimes merging two or more holes into one. New holes, after the tree has once been encircled, are always placed above old ones. It seemed to me that some of the holes yielded much more sap than others, and that the birds observed this and placed the next new holes immediately above these prolific ones. The old holes become dry in time, and the bark cracks near them, thus making the girdling of the tree complete. This is especially true of the Canoe Birch.

A Red Maple, which I watched for many days, contained over 800 punctures. In August last it was yielding sap so freely that a steady current streamed down the trunk to the ground, while from the best holes bubbles were blown by the sap as it flowed from the bark. This tree was evidently dying. Some of its limbs were dead. Its foliage was scanty, and the leaves drooped in the sunlight. Its sap in July was as sweet as well-sugared water.

In a hundred acres of woodland which I searched with care for the traces of this bird's operations, I found four families at work in as many separate spots. They were working all day and for weeks in succession. The trees which bore their marks were newly drilled, dying, dead or long dead, and decaying. In ten years these four families had killed eighty trees —perhaps more, probably fewer. Lightning and snow combined do far more damage than these birds. As a timber-owner, I should not think of shooting these birds for any injury done by them to my forest-trees. With fruit-trees in my neighborhood they meddle little, but it is perhaps because the orchards are old and unattractive.

Summary.—The Yellow-bellied or Sap-sucking Woodpecker is the most numerous of the *Picidæ* in the White Mountain region. It attacks chiefly the Canoe Birch and Red Maple, and during a considerable part of the summer works throughout every day, draining them of sap. The birds work in family groups and use only three or four trees at a time. They return to these from year to year until the trees die, when others near by are attacked in turn. The amount of damage done by the birds is insufficient to justify killing them, at least so long as their numbers remain no greater than at present.

Cambridge, Mass. *Frank Bolles.*

Recent Publications.

Third Biennial Report of the California State Board of Forestry, for the years 1889-90. Sacramento, 1890.

An account of the true Pines of California appeared in the Second Report of the Board of Forestry of that state from the pen of the botanist of the board, Mr. J. G. Lemmon, who now supplements this with a paper on the other coniferous trees of the Pacific forest, which occupies the larger part of this third report, and which is enriched with many admirable illustrations made from photographs of trees, forest-scenes, and fruiting branches of many of the species. In this paper, after some remarks upon conifers in general, their history and distribution, Mr. Lemmon describes their classification, and then proceeds to give an account of the different species (exclusive of the Pines) found in California, and in the regions of which California must be considered, from the botanical point of view, an integral part, that is, all the great territory of western America which extends north and west of the state. An account of the different species is preceded by notes on the genera to which they belong, and to this is added some information relating to species which occur entirely beyond the region. In the case of the Hemlock, for example, there is a short account of our eastern species, and of the Asiatic species of this genus; and under the Spruces, not only are the Pacific coast species described, but the White and Black Spruces of the east as well, the European Spruce, and some of the Japanese species. Changes in the generic and specific rank of a few trees are proposed. The Alpine Hemlock is here removed from Tsuga and made to compose the genus Hesperopeuce (Engelmann's sectional name), a genus characterized by Mr. Lemmon by its alpine habitat, its cones, which are longer than those of any Hemlock Spruce, oblong-cylindrical, and two to three inches long, with numerous scales, nearly all of the same size, and reflexed at maturity, broader than long, four to eight lines wide, and striate with a thin, wavy, rounded border; by the small, spathulate bracts three to four lines long, by the angular seeds with resin vescicles, and elliptical wings, three to six lines long, and linear scattered quadrangular leaves keeled above and below with a solitary and large resin duct. "The propriety," he says, in speaking of this tree, "if not the scientific necessity, of separating it from Tsuga may be justified upon the ground that the conifer family is so large, and the necessity for dividing it into groups for convenience of comparison is so apparent, that comparatively slight differences—so they are fundamental—must be taken for generic distinctions"—a view of genera, in which, we fancy, all students of conifers will hardly concur.

The large-cone Douglas Fir of the mountains of southern California, which Engelmann considered a variety of the widely distributed *Pseudotsuga taxifolia* is now restored to specific rank under the name of *Pseudotsuga macrocarpa*, because the author recognizes "in it elements that certainly point to such separation. It must be borne in mind," he remarks, "that the evidence of distinctness does not depend so much upon the number of characters as upon their permanence. Now the characters of this Spruce are always uniform—no transition trees connect it to the other species. Again, the other species is both north and south of it, particularly north. If this big-cone development is a recent variation, what has produced it? If a southern climate, why are not the Arizona and Mexican trees still larger coned? If a dwarf variety, why so prolific in fruit?" Mr. Lemmon, in a note, calls attention to the fact that when he visited the headquarters of this tree, in the San Bernardino Mountains, in 1876, "the cones of the preceding year's crop lay on the ground so abundantly that they were two or three feet deep under the trees—a degree of fecundity never observed in the Taxifolia species."

The Red Fir of the Sierras, *Abies magnifica*, is well described, and the variety of northern California, which so long puzzled botanists by its long, exserted cone-bracts, resembling those of *Abies nobilis* of Oregon, is described as the variety *Shastensis*. "The peculiarity of this variety of Fir, aside from its locality, is connected entirely with the fact of its cone-bracts becoming long and protruded, a half to a full inch between the scales, rendering the large purple cones, thus decked out with tasseled fringes, a most beautiful object." The trees of this variety, Mr. Lemmon tells us, are "very large and lofty, though not so immense and high-headed as in the typical southern form, but they become, on the southern slopes of Shasta, a dark, gloomy assemblage of massive black trunks, colored, on the north side, from base to the limbs, with bright yellow lichens or tree-moss, the lower limbs draped, here and there, with long sweeping festoons of black filmy lichen, giving a funereal aspect to the whole scene, scarce relieved by the twitter of a red squirrel, the long wailing note of a woodpecker, or the occasional cry of a bald eagle." A second variety of this species is distinguished as variety *xanthocarpa*, "a smaller, less symmetrical tree than the typical, with smaller cones averaging four to five inches long, half as thick near the base, tapering slightly to the apex, and of a yellowish color." It is found in the high Sierras around Meadow Lake, Sierra County, where, Mr. Lemmon tells us, it forms the greater part of the noble forest of that region.

Mr. Lemmon considers the White Fir of the Sierras and of the mountains of southern Oregon simply a somewhat modified form of *Abies grandis* of the north-west coast, "distinguished by having a rather rigid habit, the branches relatively shorter and stouter than those of *Abies grandis*. The young shoots are olive-green, the buds ovoid, the leaves dark green above, whitened with stomata below (also with a few rows above), the leaves relatively very long—one and a half to two inches—nearly all of the same length, obtuse at the apex, not usually two-ranked except on lower branches, yet all are twisted half around at the base, which allows the light to reach through to the branchlets past the distorted leaves. It is, in fact, midway both in locality and in characters between the green-leaved and green cylindrical-coned *grandis* of the moist northern forests and the white-leaved and light green elliptical-coned *concolor* of the southern arid interior regions." It is this tree which is called *Abies Lowiana* in English plantations, and which, from a horticultural point of view, is very distinct from the species of the north-west coast, although hardly distinguishable from the long-leaved form of the Rocky Mountains.

It is not quite clear whether our author intends to consider the California Sierra tree one variety and the Colorado tree a

second variety or not. He adopts for the California tree the name of *Abies grandis*, var. *Lowiana*. If he considers it distinct from the *Abies concolor* of Colorado, his seems to be the correct name, but if he holds that there is really but one mountain form of *A. grandis* worthy of a distinct name, then this should be known as variety *concolor*, it having been named *Abies concolor* before the name of *Abies Lowiana* was bestowed upon it.

Mr. Lemmon, in his very full and interesting description of the Big Trees, raises an interesting point as to the origin of the name Sequoia. The name was made by the Austrian botanist, Endlicher, who published the genus in 1847, but, unfortunately, did not give the etymology of his name. It has been generally supposed that it was formed from the name of the half-breed Cherokee Indian, Sequoyah, a man distinguished in having invented a syllabic alphabet for his tribe. Gordon, however, in the second edition of his "Pinetum," published in 1875, states that the name was probably formed from "sequence, separated or following in order of succession after Taxodium from which Professor Endlicher separated it." Mr. Lemmon now says that Professor Gray, at the time of his visit to the Pacific coast in 1877, informed him that "the report of its being derived from Sequoyah, the Cherokee, was doubtless an afterthought; that undoubtedly Endlicher derived his name from sequi or sequor, alluding to the well-known fact that our Redwoods are the followers or remnants of several colossal extinct species."

Further investigations do not throw much additional light on this subject, and the answers sent in reply to Mr. Lemmon's inquiries by a number of distinguished men are not very satisfactory in their conclusions. The venerable De Candolle writes: "The supposed origin of Sequoia from Sequoyah or Sequamal is entirely fanciful. By the appearance of the name it is probable that it originated from or was taken up from some native word and written more or less correctly. Historically, it is a matter of regret, of course, that any doubt rests upon the origin of the name of the two trees which surpass all others in size and in the interest attached to the history of the genus to which they belong. But, after all, as De Candolle writes, "it matters little, a name is a name, the essential things are, first, that it be the expression of a natural genus; second, that it has not been employed before; and third, that the genus has not previously received another name."

Mr. Lemmon's paper contains, in convenient and acceptable form, a great amount of useful and interesting information, botanical, historical and economic, relating to the trees which compose the larger part of the Pacific-coast forests, and which make these forests the most wonderful and important forests of conifers known to man. It will be welcomed by all serious students of American trees, and will take its place in the permanent literature of the subject.

Exhibitions.

The New York Spring Flower Show.

THE first exhibition of the New York Florists' Club, held in the Lenox Lyceum last week, was one of the most attractive displays ever seen in this city, not only because it contained so many good things, but because so few indifferent plants and flowers were admitted to fill up vacant spaces and degrade the general average of excellence. The first object presented to the eye of the visitor on entering the hall was a mass of Cytisus some twelve feet high and nearly as wide at the base. The plants at the summit and sides were of *Cytisus Canariensis*, with long, arching and pendulous branches, while the plants at the base were specimens of *C. racemosa*, of bushy and upright habit, and they gave to the whole the needed suggestion of stability. The plants were all remarkably well-flowered and the foliage was of the cleanest and freshest. Some of the plants of the type of *C. racemosa* were seedlings, and the color of the racemes of their flowers varied from nearly white to deepest yellow, and the foliage of some of them was a pleasing glaucous green. Mr. James Dean, of Bay Ridge, New York, who exhibited these plants, is said to have some seedlings of very distinct habit, which are well worth propagating as garden varieties. Mr. Dean's collection of Azaleas, too, was a noteworthy one, and he took prizes for Rhododendrons (specimens of Prince Camille de Rohan being exceptionally good) and for a remarkable group of Hydrangeas.

The centre of the hall was occupied by the prize group of Palms and decorative plants, arranged for effect, with a superb specimen of *Acanthophœnix crinita* at the summit. The mass was about fifteen feet high, and its general shape was conical. It was composed throughout of good material, and some of the plants, as, for instance, a *Dieffenbachia imperialis*, were exceptionally fine. This group was arranged with excellent taste by Mr. A. W. Bennet, gardener to William Brown, Esq., of Flatbush, Long Island. Of the three other groups which competed for this prize, that of Mr. Richard Brett, gardener to J. B. Colgate, Esq., of Yonkers, secured second prize. Besides these two prize-groups the collections of Mr. Brown and Mr. Colgate furnished many other attractive features of the exhibition. No better Calceolarias were ever seen in this city than those sent from the former, while the Palm which attracted most attention was an immense Livistona from the same place. From Mr. Colgate's collection came the first prize Cycas, the best group of Ferns, and some fine Azaleas naturally grown.

In the rear of the stage fine specimens of Areca and Pritchardia showed in pleasant relief against the light-colored paper, but this background did not help the Orchids from the same collection—that of Messrs. Pitcher & Manda, of the United States Nurseries. These Orchids were very numerous, among them being 300 Cypripediums, including many choice hybrids. The White *Lycaste Skinneri*, *Cœlogyne cristata alba*, some distinct forms of *Cattleya Trianæ*, *Odontoglossum Rookerianum* and a large specimen of *Oncidium ampliatum* were among the best. Besides the Orchids, Messrs. Pitcher & Manda's display included a tank of aquatics, some new Anthuriums, and a large general collection of greenhouse plants, and the best Tree Fern in the exhibition.

It should be added that the arrangement of the plants in the main hall was admirable throughout. Each group had abundant room, so that its best possible effect was secured, and the plants as a rule were distributed with a view to the general appearance of the exhibit, so that the collection, as a whole, looked remarkably well from the galleries and the boxes. The disposition of the plants on the floor was a great improvement on the usual plan of placing them on high stages.

In the lower room of the Lyceum there was a great display of Roses of all kinds, both in cut flowers and in pots. Taken as a whole, they were the best ever seen in New York. The wonder among them all was a group of cut flowers sent by Mr. H. Dale, of Brampton, Ontario, including Niphetos, Sunset, Bride and Catherine Mermet. They were of perfect form and good substance, while in size they were almost monstrous, being nearly as large as Pæonies. Among the potted Roses the most interesting was a large group of Baroness Rothschild and Magna Charta, shown by John Henderson & Co. The principal prizes in the Roses were taken by John N. May, F. R. Pierson, Julius Roehrs, Rudolph Asmus, Ernst Asmus and John H. Taylor. Besides the usual commercial Dutch bulbs, hardy flowers were not shown in great profusion. Some hardy shrubs forced into bloom, including Lilacs, Deutzias, Spiræas, etc., were there, but, although many of them were well flowered, it is very evident that some plants, like *Spiræa Thunbergii* and *S. prunifolia*, were never intended to be crowded out of their season. Among these shrubs were some choice hardy plants from the collection of Messrs. Pitcher & Manda, which were well flowered without overmuch forcing. Among the best of these were Tree Pæonies and Yellow Day Lilies. Hiding under the larger plants were some pots of choice Alpines, which were a very pleasant surprise to those who found them. Among them were well-flowered plants of *Frittilaria Armenna*, *Primula denticulata*, *Myosotis elegantissima*, *Aubrietia Græca* and *Arabis alpina*.

The Carnations gave renewed proof of the improvement which is steadily going on in the size and quality of these beautiful flowers. The new variety, Sea-gull, exhibited by E. G. Hill & Co., of Indianapolis, secured the silver cup offered for competition in this class. Grace Darling, another new variety, deserves special mention as an advance in good qualities over the favorite Grace Wilder. The new flower is a trifle larger, a deeper pink, and it is unusually fragrant. Flowers of the variety Mrs. Fisher, shown by Lombard, and general collections by such well-known growers as H. E. Chitty and Rudolph Asmus, were all worthy of special mention.

Notes.

More than five thousand dollars have been subscribed toward the monument to Audubon, the naturalist, which it is proposed to erect in this city.

It is said that the finest sherry wines yet produced in this country have been made in Arizona, and that this territory

promises to be to the United States what Spain is to Europe in the production of wines of this quality.

In a bulletin from the Iowa Experiment Station it is stated that since there is a concentration of albuminoids near the eyes of ripe potatoes, and since albuminoids are much more nutritious than starch, therefore potatoes should always be cooked with their skins on.

Spiræa confusa is a pretty pot-shrub which should prove of good service as a source of flowers for Easter. Messrs. Veitch exhibited a group of it in flower at a late exhibition of the Royal Horticultural Society; the plants were about two feet high, compact, yet elegant, and thickly clothed with hawthorn-like bunches of white flowers.

California truck-farmers and grape-growers are complaining about the census bulletins. They declare that a single county alone has more acres in Asparagus than is credited to the whole state, while Egg Plant, which goes eastward by the car-load, and other vegetables extensively grown, have no mention whatever. In the viticultural bulletin Californians assert that figures which were used several years ago are reproduced; that in Fresno County, for example, which is credited with less than 20,000 acres in vines, there are really more than 50,000 acres in wine and raisin grapes.

Professor Hilgard states in a late bulletin that there is little doubt that, in the valleys of the southern parts of California, Ramie can be grown, with success and with profit, as soon as satisfactory methods of marketing are devised. He reminds planters, however, that a crop that will produce, in one season, ten tons of dry stalks to the acre must be exhausting, and that the fibre sold represents a larger proportion of the plant-food in the soil than does the fibre of the Cotton-plant. This means that proper care must be taken to return the refuse of the plant to the soil, or that fertilizers must be purchased.

Mr. T. S. Gold, writing in the *American Garden*, under the heading, "Apple Orchards of My Youth," says that the first commercial orchard he ever saw "was in Dutchess County, New York, planted about 1830 by a Mr. Constock. There were some twenty or thirty acres all of one variety, the English or Poughkeepsie Russet, for the New York market." Before the year 1835, he adds, "I had never heard of an apple failure. Then there came a succession of cold springs, blasting the blossoms, and ice-storms breaking the trees, so that with the incoming of the temperance reformation, doing away with cider, many orchards were cut down and few new ones planted for twenty years."

Chrysanthemums in April are curiosities, and a few plants in flower, shown by Pitcher & Manda at the exhibition in this city last week, attracted some attention. One of them with flowers in the shape of a bird's nest, and named Ulysses, was a novelty. Mr. Manda says that these plants have had no different care from the others in their large collection, but they seem to have the peculiarity of coming into bloom soon after they are struck, without regard to the season. Suckers from the plants on exhibition, only four or five inches high, showed flower-buds at their extremities, and perhaps these plants are the forerunners of a class which will give flowers all the year round.

A very useful little book is "The Reader's Guide in Economic, Social and Political Science," edited by R. R. Bowker and George Iles. Mr. Iles, however, is credited with the great bulk of the editorial work, and, as might be expected, the work is done exceptionally well. The book is a classified bibliography with descriptive notes, which will enable any one to find out, by the help of its very complete index, where the best reading can be had on any of the subjects within its range. Readers of Garden and Forest will be particularly interested in knowing that forestry is taking its place among the subjects of economic interest, and that, in addition to a good list of writings on the subject, which cover two pages, there are allusions to the subject scattered through the "Reader's Guide" in many other places, as, for example, in the brief summary of Mr. H. C. Adams' essay on Public Debts, it is noticed that reasons are there given why state governments should take in hand the care of their forests.

We have received the first part of the *Flora Franciscana*, "an attempt to classify and describe the vascular plants of middle California," from the author, Edward L. Greene, Assistant Professor of Botany in the University of California, who has had unexcelled opportunities for studying the flora of California. The arrangement of the families, the work beginning with the *Leguminosæ*, differs essentially from that adopted by most botanists, from the majority of whom Professor Greene differs also in his limitations of some genera, like Prunus and Pyrus, the former being redivided into Amygdalus (of Theophrastus), Prunus and Cerasus, and the latter, so far as California is concerned, into Sorbus (of Theophrastus) and Malus. Several new species are proposed. While botanists may disagree with Professor Greene's views upon classification, they will find in this new book of his proof of his great industry, and much valuable information about the plants described of a character which can be acquired only by long familiarity with them in a living state, and therefore of great value and importance.

The *Kew Bulletin* for March contains a valuable list of the Orchids which flowered at Kew in 1890. It enumerates 766 species and varieties, and is published to afford data as to the time and duration of the flowering period of Orchids cultivated in England. In the Kew collection no attempt is made, by the cultivation of a large number of examples, to give prominence to the most showy-flowered. On the other hand, as the *Bulletin* explains, every effort is made to obtain and cultivate even small and unattractive kinds of scientific interest, such as the ordinary collector would consider beneath his notice. In the limited space available for Orchids as comprehensive a collection of species as possible is aimed at. Consequently, while there is never a great display of Orchid-flowers at Kew, at no time of the year is the collection wanting in flower interest. Thus, while the highest number of species flowered in any one month was 125 in May, the lowest was eighty-five in January. The average for each month was a fraction over 100. In 1811 the number of species in cultivation at Kew was only thirty-seven. There are now 1,342 species, comprised in 158 genera. These figures do not include 174 varieties, and over 100 undetermined plants. The collection is kept up by means of exchange, and a small outlay, about £20 annually, for plants which can be obtained only by purchase.

In his famous "History of Plymouth Plantation" Governor Bradford tells how the Pilgrims first made acquaintance with Indian Corn, and with the beans still so generally associated with it in New England kitchens. The discovery was made while they were searching for "a place of habitation" on Cape Cod, before the final settlement at Plymouth. On the 15th of November, 1620, an exploring party landed at a spot supposed to have been within a furlong of the end of Long Point, and the following day, after a trying experience amid "schuch thickets as were ready to tear their cloaths & armore in peeces . . . at length they found water & refreshed themselves, being ye first New-England water they drunke of, and was now, in thir great thirste, as pleasante unto them as wine or bear had been in for-times." Soon after they came upon a place where the Indians had formerly planted Corn, and upon some of their graves. "And proceeding furder they saw new-stuble wher corne had been set ye same year," and in deserted huts, among other things, found "faire Indean baskets filled with corne, and some in eares, faire and good, of diverce colours, which seemed to them a very goodly sight, (haveing never seen any schuch before)." Returning to the ship, they "tooke with them parte of ye corne, and buried up ye rest, and so, like ye men from Escholl, carried with them of ye fruits of ye land & showed their breethren; of which & their returne, they were marvelusly glad, and their harts incouraged." Going once more to the same spot they found two deserted Indian houses, and "also ther was found more of their corne, & of their beans of various collours. The corne & beans they brought away," intending to pay the Indians for them when "they should meete with any of them," as happened about six months later "to their good contente. And here is to be noted a spetiall providence of God, & a great mercie to this poore people, that hear they gott seed to plant them corne ye next year, or els they might have starved, for they had none, nor any liklyhood to get any till ye season had beene past (as ye sequell did manyfest)." In the month of April, 1621, a friendly Indian, named Squanto, helped them to plant their corn, "showing them both ye manner how to set it, and after how to dress & tend it. Also he tould them excepte they gott fish and set with it (in these old grounds) it would come to nothing, and he showed them yt in ye middle of Aprill they should have store enough come up ye brooke"; and all these things they found true "by triall & experience." Then Bradford adds, with the quaintest carefulness not to commit himself upon a doubtful point, "Some English seed they sew, as wheat and pease, but it came not to good, eather by ye badnes of ye seed, or latenes of ye season, or both, or some other defecte."

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Recent Forest-legislation.

JUST as the last session of Congress closed, an act "to repeal the timber-culture laws and for other purposes" was passed. Hereafter, then, no settler on public lands will be able to obtain a homestead by the planting of trees, although any person who has already made entry on public lands under the timber-culture laws, and who has in good faith complied with their provisions, is entitled to make his final proof and acquire his title. There is no doubt that under this timber-culture act there was much fraud, and there was a melancholy waste of labor and energy owing to the ignorance of planters, and even when a settler did secure land by an honest effort to comply with the law it proved a most expensive way of obtaining a homestead. The repeal of this law was, no doubt, proper, although it may be questioned whether the Government should not have offered to settlers some other stimulus to plant groves and forests. Very few forests have been started on a hopeful life under this act, but every tree-covered acre on those wind-swept plains has great value in itself as an example to others.

This bill contains a great many provisions entirely distinct from the timber-culture repeal, to only one of which we can here invite attention, and of this we have before spoken. Section 24 authorizes the President of the United States from time to time to set apart and reserve any part of the public lands, wholly or in part covered with timber or undergrowth, as public reservations, and the President may by proclamation declare the establishment of such reservation and the limits thereof. The language of this act seems to imply that this proclamation of the President's means more than a mere temporary withholding of the land from entry; that it establishes such forest as a public reservation forever. The President has already under this law accomplished by proclamation the extension of the Yellowstone Park, which the friends of that reservation have been vainly attempting to gain by specific enactment during eight successive sessions of Congress. This proclamation extends the area of the park eight and a half miles to the southward, and on the east adds a strip of country between twenty-four and twenty-five miles wide and fifty miles in length. This last region includes for the most part the Absaroka range, a rough, unsurveyed and little-known country, rarely crossed except by a few hunters. Within this territory peaks rise from 10,000 to 11,000 feet above the sea-level, and its average elevation is over 8,000 feet. In these mountains many of the streams which run into the Yellowstone Lake take their rise. The country to the south is very beautiful, rough, abounding in water, full of game, the favorite breeding-place of the elk; in it is the source of the Snake River. The Secretary of the Interior will place this reservation under the jurisdiction of the superintendent of the park, so that the law and its first-fruits are a matter of universal congratulation.

As there is no restriction to the President's exercise of power in this matter, it is to be hoped that many more considerable forest-areas can now be placed in permanent forest. One place worthy of immediate consideration is the region north of Flathead Lake, within the limits which were laid down in a bill introduced some years ago by Senator Edmunds. This territory, including the crest of the Continental Divide and the wild mountain-ranges to the west of it, is altogether too rugged for prosperous agriculture, and its forests are of incalculable value at the sources of some branches of the Missouri and one fork of the Columbia River. Snow-clad peaks, scores of cascades plunging from lofty cliffs, forests which seem of limitless extent, unite to give unparalleled grandeur to the scenery. If the President of the United States could be induced to set apart this and other regions which could easily be named, and could place them under the charge of the army of the United States, a long step forward in the solution of the forest-problem on the national domain would be taken.

On the same day when this act was passed an amendment to it was made which permits timber to be cut and removed from the forest-lands of the public domain for mining, manufacturing or domestic purposes under regulations prescribed by the Secretary of the Interior. This, so far as we can see, practically opens the whole timber domain of the country to the axes of trespassers, with no restraint beyond what the Secretary of the Interior may choose to exercise. If the Secretary does this in an indirect way, as has formerly been the case, the restraint is likely to be slight. It is imperative that the Secretary should issue some strict regulations in this regard, for without energetic action on his part there will be a general devastation of the public lands. These laws have hitherto been interpreted so liberally, and the frontiersman has become so accustomed to preying upon timber of the Government as if it was his own, that any check upon this unrestricted privilege is looked upon as an infringement of his personal rights.

Class Vines and Class Trees.

IT is the custom in some of our country high-schools for the graduating class to plant a tree in the neighborhood of the school-house, and for a long period it has been the time-honored custom of universities to set out a vine in commencement week, to commemorate the class that is about to leave college.

During a visit last summer to an eastern college our attention was called to the Ampelopsis, each one labeled with the date of the class cut in one of the stones of the foundation of the chapel, by which the plants were set, and it was melancholy to see how forlorn and small many of them were, and how others had died completely for lack of attention. The same may be said of numbers of the pitiful little Maples and Elms that huddle around the unpicturesque and bare high-school buildings in some

parts of New England, which really should by this time be amply shaded, if a proper attention had been paid to the young trees when set out.

A radical change should be made in the time of planting these commemorative trees and vines. Instead of setting them out at the close of its career every class should, on entering the school or university, erect its growing monument and devote its best energies during the four years of school or college life to having its vine or its tree beat the record in growth and vigor. In this way, if one specimen died another could be planted, that the class might be sure of a memorial, while yearly a committee should be appointed to attend to the plant and a small subscription be levied on each member of the class for proper fertilizers and cultivation.

If the personal attention of the boys could be given to the subject, if they would themselves dig about and enrich and prune what they had planted and would take pride in it, the effect would be good in awakening in their minds an interest in the growth of plants and trees; and some slight knowledge might be acquired of climatic and soil conditions and a hint might be given to them of one of the best and purest pleasures which is within the grasp of man.

In this way could be instilled into the rising generation an interest in forestry that might in time bear fruit in greater care for this property of the nation. Among the books of reference in schools some should be supplied which treat of the proper management of growing things, so that the youths and maidens could study the subject for themselves. If, at the end of each year or four years, some slight reward, such as a simple medal or even an honorable mention, could be awarded to that plant or tree which had made any surprising growth, it might still further stimulate an interest among the young people in this most beautiful and useful work. Masters of schools and professors of colleges should use their influence to bring about this change as speedily as possible, for it could not fail to do good to the youths themselves, and would replace, with vigorous trees and vines, the usually melancholy specimens which many classes now leave behind them as their monument.

Notes on the Distribution of Some Kansas Trees.—II. The Cottonwood (Populus monilifera).

THE Cottonwood is rivaled only by the Elm in the extent of its distribution in the state. While most abundant on the low ground bordering the main streams, where giant trees overhang the water mile after mile, it is also found scattered along most of the smaller tributaries, but always where its roots can reach permanent moisture. Westward it extends as far as trees of any description are found, which is to the west line of the state in several valleys, scattering groves or single trees only occurring in the western tier of counties, and these on the immediate banks of the water-courses. Surprisingly large trees have grown, though now cut down, at points west of what many suppose to be the timber limit of the state. On Walnut Creek, a large tributary of the Arkansas, was the old military post of Fort Zarah, in the western part of Rush County, about two hundred and seventy miles from the eastern line of the state. The post was constructed of heavy Cottonwood logs, many of which were in good preservation ten years ago. This points to a considerable growth of the original timber along this stream, and scattering groves of fair-sized trees may be found to-day through the next county, and single trees to the head of the stream. A huge tree was cut near the Saline River, in Ellis County, a few years ago, which furnished ninety-six loads of wood; the stump measured eight feet across.

The Cottonwood is justly entitled to rank as the historical tree of Kansas. It entered largely into the construction of most of the early buildings, from the frontier stockade, which protected its group of earth-roofed log-cabins, to the wind-swept shanty of the prairie homesteader and the pretentious storehouse and hotel of the growing young town. Men who have helped to make history, both in state and national affairs, will tell of the hardships and adventures of a new country when the cottonwood shanty was the home, office and business block in one.

Park-like groves of these tall trees were abundant along the larger streams, where the first settlements were established, and their shapely trunks afforded the most available supply of logs for the saw-mills which followed the advance-guard of settlement. With Pine lumber only to be had by hauling from points on the Missouri River, we can readily see why the Cottonwood played so important a part in the development of the country.

After the building of the Union Pacific Railroad, which brought Pine lumber within much easier reach of the settlers of the Kansas valley, the greater cheapness of the native lumber caused it to be used largely for the frames of buildings, while Pine was used for covering and finish. This lumber varied greatly in quality, much of it being of a loose, spongy character, warping and twisting into the most fantastic shapes when exposed to the sun and wind. A house built entirely of it, after a few months, afforded but scanty protection against the winter winds. Certain trees furnished lumber of a firm, straight grain which made excellent frames, and even very acceptable floors and inside finish. When once firmly nailed to its place, if clapboarded and shingled with Pine lumber to exclude the weather, Cottonwood made a strong and durable building. I have examined houses that have stood for thirty years where the Cottonwood joists and sheathing boards were as straight and sound as when placed in position.

One of the institutions of the new country, which has disappeared with the steam saw-mill, was the shingle-mill, where the shingles, instead of being sawed or rived, were cut. The shingle blocks, after having soaked in a tank of hot water, were placed upon the machine at a suitable angle, when the descent of a broad, thin knife, operated by horse power, pared off the shingle much as the thin stuff for fruit packages is now cut. These shingles were of poor quality, and needed frequent renewal. A much better article was secured by the primitive process of riving and shaving them on the "horse," so common on the New England farm. These I have seen which had lasted for twenty years in fairly good condition.

A variety known as the Yellow Cottonwood was recognized by choppers and mill-men, and much prized for the superior quality of its lumber, which was unusually firm and heavy, straight-grained and of a peculiar color recognizable when the tree was cut. As seen standing, the tree was supposed to have a straighter trunk and deeper-furrowed, darker bark than the common form. Whether any well-marked, constant type can be made out is questionable, though the extra quality of lumber from certain trees cannot be doubted. Whether these characteristics can be transmitted by propagating from such specimens by cuttings is a question only to be settled by experiment.

In searching for the finest specimens of Cottonwood in this part of the state, one is constantly reminded that the trees with the finest trunks have been cut and sawed years ago. A tree upon the north bank of the Kansas (see page 187), a short distance below Manhattan, measures twenty-four feet in girth at two feet above the ground, and forks into three branches at ten feet. The spread of its top is over eighty feet. This is the type of a large number of trees which line the banks of our Kansas rivers. Their immense spreading tops have a grandeur not equaled by any other tree in the state. On the Blue River three trees, only a short distance apart, were measured which were twenty feet in circumference, with trunks of from twelve to thirty feet to the first limb. One of these has a top of 104 feet spread, and it is as many feet high. Several others of from sixteen to twenty feet in circumference were measured in the same locality.

The Cottonwood has been more extensively planted on timber claims and for shelter-belts than any other tree. This is due in part to its rapid growth while young, and quite as much to the ease with which a large proportion of trees can be procured from cuttings. That a large number of these have failed is not a matter of surprise, when we remember the moisture-loving nature of the tree. After a few years of rapid growth, trees on the upland begin to fail, and a dry season thins out a large portion of them. Where a plantation includes a little draw which obtains additional moisture the greater size and vigor of the trees are very noticeable. On bottom-lands the growth obtained from a plantation of Cottonwoods in twenty years is astonishing. There are, along many streams, acres of low, sandy land, where farm crops cannot be profitably grown, but which will develop the Cottonwood to perfection. Plantations in such places would yield in fuel enough to pay for all outlay, and the growth of body-timber in twenty or thirty years would be of great value for the many purposes to which cheap lumber is applied, such as crates, baskets and all

kinds of temporary packages, as well as the rougher lumber for buildings.

If plantations could be successfully started of the so-called yellow variety by the use of cuttings the value of the lumber would be greatly increased.

As an ornamental tree the Cottonwood is not well adapted to the fifty-foot village lot, where it is so often planted, only to be cut back into an unsightly pollard when the owner begins to need the space for his house. As an avenue tree for low lands, and where it can be offered plenty of room, no tree in the west is its equal. It is a tree planned on a large scale, and should be grown where the general landscape-effect is large and broad. The nuisance of the flying cotton at seeding time can easily be avoided by propagating only from cuttings of staminate trees, which are readily distinguished by their large red flower-buds in the spring before the leaves open.

Kansas Agricultural College. *S. C. Mason.*

The Sap and Sugar of the Maple-tree.—II.

NEXT comes the positive evidence of Joutel (1684–88), the companion of La Salle till his death, and the only one of his followers (as Charlevoix says) on whom La Salle could depend. He gives clearly both time and place and narrates what he found when laid up by stress of weather and lameness at Chicagou. He says:

"Nous arrivames à Chicagou le 29 du dit [Mars, 1688]. 'Le temps, qui se tint rude nous obligea à rester en ce lieu jusqu au 8 Avril, . . . nous n'avions pas beaucoup de viande mais la Providence nous fournissoit une espèce de manne pour adjouster a notre bled d'Inde, la quelle manne estoit d'un suc que les arbres jettent dans cette saison, et notamment les Érables, dont il y en a quantité dans ce canton, et qui sent fort gros. A cet effet nous faisions de grandes entailles à chaque arbre, auquel nous mettions un vaisseau et un couteau au bas de l'entaille pour conduire la liqueur qui proprement est la séve de l'arbre, laquelle etant bouillie, a force de diminuer devient du sucre.' Nous nous servions de cette eau pour fair bouillir notre bled d'Inde ou sagimité, ce qui lui donnait un assez bon goust c'est à dire un peu sucré. Il semble que la Providence fournit à tout cas comme il n'y a point de cannes à sucre dans ces cantons les arbres en fourmissent; du moins j'en ai veu qui estoient excellent; il estoit excellent; il estoit plus rouge que le notre, c'est à dire celui dont en se sert en France, mais presque aussi bon."*

Père Sebastien Rasles, of the Society of Jesus (1689–1724), says: "Ma nourriture n'est que de blé de Turquie qu'on pile, et dont je me fais chaque jour une espéce de bouillie que je cuis dans de l'eau. Le seul adoucissement que j'y apporte, c'est d'y mêler un peu de *sucre* pour en corriger la fadeur. On n'en manque point dans ces forêts."

"Au printemps, les erables renferment une liqueur assez semblable à celle que contiennent les cannes des îles. Les femmes s'occupent à la recevoir dans des vases d'écorce, lorsque ces arbres la distillent; elles la font bouillir, et elles tirent un assez bon sucre. Le premier qui se tire est toujours le plus beau."†

La Hontan (1684–92) says: "Les herables . . . n'ont aucun rapport à ceux d'Europe. Ceux dont je parle, ont une sêve admirable et telle qu'il n'y a point de limonade, ni d'eau de cerise qui ait si bouquet, ni de breuvage au monde qui soit plus salutaire."

"Pour en tirer cette liqueur on taille l'arbre deux pouces en avant dans le bois, et cette taille qui a dix ou douze pouces de longeur est faite de biais; au bas de cette coupe on enchasse un coûteau dans l'arbre aussi de biais, tellement que l'eau coulant le long de cette taille comme dans une gouttière, et rencontrant le couteau qui la traverse, elle coule le long de ce couteau sous lequel on a le soin de mettre des vases pour la contenir."

"Tel arbre en peut rendre cinq ou six boutéilles par jour, et tel habitant en Canada en pourrait ramasser vingt barriques du matin au soir, s'il voulait entailler tous les Erables de son habitation. Cette coupe ne porte aucun dommage à l'arbre. On fait de cette sêve du Sucre et du Sirop si precieux qu'on n'a jamais trouvé de reméde plus propre à fortifier la poitrine."

"Peu de gens ont la patience d'en faire, car comme on n'estime jamais les choses communes et ordinaire, il n'y a gueres que les enfans qui se donnent la peine d'entailler ces arbres."

"Au reste, les *Erables* des pais Septentrionaux ont plus de séve que ceux des parties meridiónales, mais cette séve n'a pas tant de douceur."*

Père Lafitau, of the Society of Jesus (1700–05), says: "Nos sauvagesses font le sucre, quelle expriment du suc des arbres, et en particulier des Erables."

"Au mois de Mars, lorsque le soleil a pris un peu de force, et que les arbres commencent à entrer en séve, elles font des incisions transversales avec la hache sur le tronc de ces arbres d'où il coule en abondance une eau qu'elles recoivent dans des grands vaisseaux d'écorce; elles font ensuite bouillir cette eau sur le feu, qui en consume tout le phlegme, et qui epaissit le reste en consistence de syrop, ou même de pain de sucre, selon le degré et la quantité de châleur qu'ils veulent lui donner. Il n'y a point à cela d'autre mystère."†

The "burnt taste" which he describes would naturally result from the primitive Indian method of evaporating the sap by red-hot stones in vessels of bark or wood.

James Smith (1755–60), an English youth, was taken captive by Indians in 1755 at the age of eighteen years, and carried to Fort Duquesne just before Braddock's defeat. He was adopted by the tribe, made an Indian, and kept as such with them for five years. He says:

"Some time in February (1756) we began to make sugar. As some of the Elm-bark will strip at this season, the squaws . . . took the bark off the tree, and of this bark made vessels in a curious manner that would hold about two gallons each; they made above one hundred of that kind of vessels. In the Sugar-tree they cut a notch sloping down, and at the end of the notch stuck in a tomahawk; in the place where they stuck the tomahawk they drove a long chip in order to carry the water out from the tree, and under this they set their vessels to receive it. As Sugar-trees were plenty and large here they seldom or never notched a tree that was not two or three feet over. They also made bark vessels for carrying the water that would hold about four gallons each. They had two brass kettles that held about fifteen gallons each for retaining the water; and though the Sugar-trees did not run every day, they had always a sufficient quantity of water to keep them boiling during the whole sugar season.

"The way that we commonly used our sugar while encamped was by putting it in bears' fat until the fat was almost as sweet as the sugar itself, and in this we dipped our roasted venison."‡

Again, he says: "Shortly after we came to this place—head-waters of Big Beaver Creek—in February (1757) the squaws began to make sugar. We had no large kettles with us this year, and they made the frost, in some measure, supply the place of fire in making sugar. Their large bark vessels, for holding the stock water, they made broad and shallow, and, as the weather is very cold here, it frequently freezes at night in sugar time, and the ice they break and cast out of the vessels. I asked them if they were not throwing away the sugar? They said no, it was water they were casting away, sugar did not freeze, and there was scarcely any in that ice. . . . After several times freezing, the water that remained in the vessel changed its color, and became brown and very sweet."§

Monsieur Bossu, Chevalier de l'Ordre Royal et Militaire de Saint Louis, and a captain in the French navy (1756-71), writing "aux Illinois, Nov., 1756," says: "Apres les premières civilités, [au Village des Péorias] on m'apporta une calabasse pleine du suc végétal d'un arbre qu'on appelle *érable*. Les sauvages le tirent au mois de Janvier, en'y faisant un trou au pied avec une vrille à laquelle ils adaptent une canule. Il en découle au premier dégel environ une barrique d'eau, ou de jus, qu'ils font bouillir jusqu'à ce qu'il soit réduit en sirop lequel étant rebouilli, se convertit en sucre un peu roux, et semblable à la manne de Calabre, les apoticaires le préferent justement au sucre de cannes. Lez François, établis aux Illinoiz, *ont appris des sauvages* la façon d'en faire."

"A l'entremet, on m'apporta plein une gamelle de bouillie de sagamité assaisonnée avec du sirop *d'erable*, ragout sauvage, assez bon and tres rafraîchéssant."‖

Bossu also says, writing, "Au pays des Akansas": "Ils me donnerent pour boisson une liqueur que ces sauvages nomment *Iachita*. Elle ressemble à du lait d'amande pour la blancheur; mais elle est beaucoup plus épaisse—on la fait avec du maïs. Ils le cueillent lorsqu'il est tendre, and après en avoir exprimé le suc, on y met du *sucre* de canne ou *d'erable*."

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* "Voyage depuis les Illinois jusque a Missilimakinak." Margry, iii., pp. 509-10. Paris, 1879.

† Rasles, to his nephew, 15th October, 1722. Narratsouk. Lettres Edifiantes. Vol. iv., p. 83. A. Lyon, 1819.

* La Hontan, vol. ii., pp. 61—2. A la Haye, 1706.

† Lafitau, Moeurs des Sauvages Ameriquains, vol. ii., pp. 153—5. Paris, 1724.

‡ Captivity of James Smith. Cincinnati, 1870, pp. 36-37.

§ Idem, pp. 68-9.

‖ Nouveaux Voyages aux Indes Occidentales. Part I., Lettre ix., p. 164. Amsterdam, 1769.

"Cette boisson est non-seulment fort nourissante mais fortifie l'estomac. . . . La plupart des femmes blanches qui veulent entretenir la fraicheur de leur teint en prennent en decoction, et s'en lave la peau du visage."*

Besides the interest of a new cosmetic, this passage indicates, at this date, a supply of maple sugar corresponding to that of the cane.

Though this record of evidence is limited, it seems clearly to show that the Indians understood and made use of the sap of the different Maples, and perhaps of the Beech, before the advent of the European; and that, before the discovery of the Mississippi, the making of maple sugar must have been an established industry among their tribes. The narrative of James Smith indicates that the making of sugar was not known by the Pennsylvanians as late as 1656.

Providence, R. I. *William D. Ely.*

Two Studies for House Plantings.

MOST American suburban houses stand naked in naked enclosures. The ugly fact has been pointed out, and the obvious remedy has been suggested in previous numbers of this paper. (See papers on "How to Mask the Foundations of a Country-house," vol. ii., pp. 350, 362, 386 and 409.) It has been shown that even in the smallest house-yards one helpful thing can be easily accomplished—the building may be connected with the ground and the appearance of nakedness removed by massing shrubs along the bases of the walls or piazzas. In almost every situation, be it among sea-side ledges or amid fertile lawns, some planting of this sort is required, the arrangement of the plants and the selection of sorts being carefully adapted to the character of the site and the style of the building.

In the suburbs of northern cities a square, stiff, high-studded and somewhat pretentious house is very common. Such houses are often surrounded by piazzas or verandas. In summer beds of gaudy Geraniums or foliage-plants border the piazzas or flaunt in scattered circles or half-moons. In winter the windows look upon bare beds of loam. This is a style of planting which costs much trouble, but its results are never permanent, and seldom tasteful. It works with herbaceous plants, and these chiefly of tender sorts.

The style of planting which uses permanently effective shrubs and hardy perennial herbs is illustrated by the diagrams and lists on page 185. Two houses of the stiff suburban type of twenty years ago are distinguished in the drawing by being numbered 1 and 2. Both houses are half-surrounded by roofed piazzas, the floors of which are several feet from the level surrounding ground. House Number 1 is inhabited the year round. Number 2 is not occupied in winter. Each house is shown twice in our drawing, for the purpose of presenting alternative planting schemes, prepared by two professional designers of plantations, one of whom submits the diagrams lettered A, and the other sends the schemes marked B.

In very briefly comparing these two schemes it must first be noted that both designers have planned continuous masses of plants, broken only at the piazza-steps. Undoubtedly the level character of the two sites and the formality of the buildings combined to compel them to this essentially stiff arrangement. Irregular buildings on broken ground would be planted in a very different manner. Here, in the schemes marked B, the formality is a little less pronounced than it is in the others, for the outline of the planted space, which is the edge of the grass, is a gently flowing line, whereas in the schemes marked A it is a line drawn strictly parallel to the edge of the surrounding drives and walks, leaving a grass strip two feet wide throughout.

As respects the massing of plants within the spaces thus outlined, the A schemes are again a little more formal than the Bs. The masses of each kind are here arranged so as in a measure to correspond to the openings between the roof-posts of the piazza, while in the B schemes this symmetry seems rather to be shunned. The writer must record his feeling that the designer of the A schemes might well have gone a step further in his chosen direction and have secured a more symmetrical balancing of masses at the sides of the several flights of entrance steps. In cases like these, where formality is almost a necessity, pronounced symmetry is generally more effective than any half-way measures.

As respects the choice of plants with which to make the masses determined upon, there is little to choose between the two schemes. This, which is commonly considered the chief problem in planting, is really subordinate to the more fundamental questions of outline, form and ultimate altitude. Plants must not be chosen simply for their prettiness; they should be selected for their fitness to produce the desired outlines and masses. Both designers have evidently been guided by this principle. Thus, in diagram 1 A, the author has set a dwarf Magnolia opposite a certain corner of the piazza, not so much because he adores Magnolias as because he wants, at that point, something distinct and forcible. Similarly, in diagram 1 B, the creeping Cranberry is freely used in the front edges, not because it is fashionable or gorgeous, for it is neither, but because it will perform a service of importance, namely, the covering of the ground in the edges near the grass.

Further comment could only emphasize the lesson that even house planting should be regarded studiously. Its problems, like those of larger planting, are real problems in design. It must be so regarded if our house-grounds are to cease to exhibit the monstrous forms of decoration which are now so common.

Boston. *Charles Eliot.*

*Noveaux Voyages dans l'Amerique Septentrionale, pp. 237-8. Amsterdam, 1777.

Notes on Some Insects and Insect Remedies.

IN the second volume of Garden and Forest, p. 461, there was given a notice and figure of a troublesome Elm pest (*Gossyparia ulmi*), an insect related to, and having many of the habits of, the scale insects. During the last two years the pest appears to have spread over a much wider territory, and to have attracted attention in various places besides the localities where it was first noted. In the Report of the Vermont State Agricultural Experiment Station for 1889 it is reported as quite common on Elms, and doing much damage to them at Burlington, where it is said to have existed for several years. While the injuries caused by this insect are slow and not immediately disastrous, the effects of large numbers on the trees prove very disagreeable and detrimental to the beauty of their appearance, and the vital sap taken from the tree eventually results in loss of vigor.

Some natural aids may ultimately be of assistance in keeping the pest in check, and meanwhile we have to depend on artificial remedies to clean the trees.

Where they are large it will be almost impossible to clear the Elms of these insects, but the nuisance may be mitigated by one or two sprayings of kerosene emulsion. Young trees recently planted out show more quickly the injurious effects caused by the insects sucking their juices. It is possible to destroy all of these pests on such small trees by giving every limb a thorough wash of whale-oil soap dissolved in the proportion of one pound of soap to a gallon and a half to two gallons of water, and applied in early spring just before the buds open.

When the insects are in an active state the spraying by kerosene emulsion may be most effectually applied against them. In this vicinity the chief active periods occur in the latter part of April and early in May, in the last of June and early July and again in August. As some inquiries have been made regarding the emulsion, the following is given as a good standard. It is the formula recommended as the best by Professor Riley.

Dissolve half a pound of common or whale-oil soap in one gallon of boiling water. While still hot add this solution to the kerosene and vigorously churn the mixture. This may be done in five minutes by means of a force-pump and spray-nozzle. The emulsion, if perfect, forms a cream which thickens on cooling, and should adhere without oiliness to the surface of glass. Before using, dilute, in the proportion of one part of the emulsion to nine parts of water, the three gallons of emulsion, thus making thirty gallons when diluted. It is best applied by means of a force-pump and fine spraying nozzle, of which there are numerous styles in the market. The Riley or Cyclone nozzle is considered one of the best, and it is not patented.

The emulsion, much less diluted, may be used as a wash, instead of whale-oil soap, on the stems and branches before the leaves expand.

Professor Fernow's notice regarding "Insect Lime for the Gypsy Moth," in Garden and Forest for March 25th, offers some valuable suggestions, and places before our notice a remedy or preventive which may prove very useful against certain destructive insects. If better, it promises to take the place of printers' ink or the expensive oil-troughs as a band around trees to keep the female Canker-worm moths from ascending to deposit their eggs in autumn and spring.

The merits of its recommended use against the Bag-worm, Fall-web worm, Tussock Moth and Gypsy Moth do not appear to be so generally understood. The female Bag-worm moth, like that of the Canker-worm, is wingless, but it undergoes all

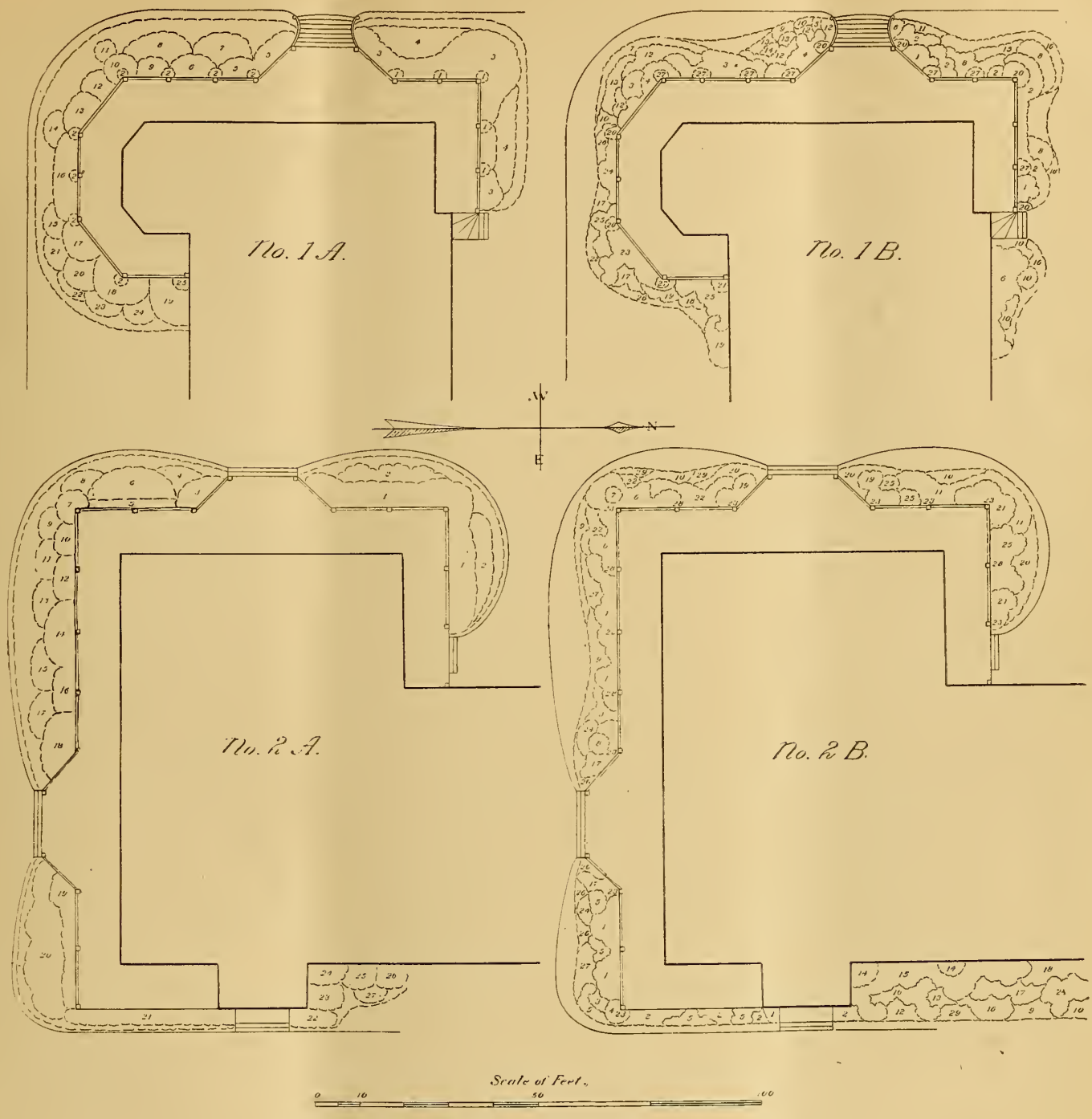

Fig. 33.—Plans for Planting about Piazzas.—See page 184.

No. 1 A.

1, Akebia quinata; 2, Lonicera Chinensis; 3, Rhododendrons; 4, Kalmia latifolia; 5, Rosa rugosa; 6, Rosa rugosa alba; 7, Rosa nitida; 8, Rosa lucida; 9, Rosa multiflora; 10, Forsythia Fortunei; 11, Magnolia stellata; 12, Exochorda grandiflora; 13, Viburnum plicatum; 14, Spiræa callosa; 15, Berberis Thunbergii; 16, Viburnum cassinoides; 17, Viburnum Opulus; 18, Thuya occidentalis; 19, Thuya occidentalis (pyramidal); 20, Cornus alba Sibirica; 21, Juniperus communis; 22, Juniperus communis aurea; 23, Pinus strobus nanus; 24, Thuya occidentalis compacta; 25, Wisteria Sinensis.

Perennials.—Among 3 and 4: Lilium superbum, Lilium Canadense. In front of 3 and 4: Crocus, yellow and purple; Daffodils, single and double. In front of 7 and 8: Daphne Cneorum, Viola, Hepatica, Myosotis. Around 11: Anemone Japonica. In front of 12 and 13: Pæony, Foxglove, Canterbury Bell. In front of 14, 15 and 16: Papaver orientale, Hibiscus Moscheutos, Hemerocallis flava.

No. 2 A.

1, Rhododendron; 2, Kalmia; 3, Spiræa van Houttei; 4, Genista tinctoria; 5, Hollyhocks; 6, Pæonies, Foxgloves, Canterbury Bells; 7, Rosa multiflora; 8, Iris Kæmpferi; 9, Anemone Japonica (white); 10, Exochorda grandiflora; 11, Hypericum aureum; 12, Hibiscus Moscheutos; 13, Delphinium perenne; 14, Viburnum cassinoides; 15, Papaver orientale vars.; 16, Viburnum plicatum; 17, Rosa rugosa alba; 18, Rosa rugosa; 19, Ligustrum Ibota; 20, Azalea in variety; 21, Spiræa Thunbergii; 22, Berberis Thunbergii; 23, Deutzia Sieboldii; 24, Rhus glabra; 25, Philadelphus grandiflorus; 26, Chionanthus Virginica; 27, Hydrangea paniculata grandiflora.

Perennials.—Among 1 and 2: Lilium superbum, L. Canadense and L. speciosum. In front of 1 and 2: Crocus, yellow and purple; Daffodils, single and double. In front of 3 to 18: Astilbe Japonica, Viola pedata, Papaver nudicaule, Lilium candidum, Hardy Pinks, Iris Germanica and aristata, Campanula Carpatica, Doronicum Caucasicum. In front of 20 and 21: Daphne Cneorum. Akebia and Lonicera as in No. 1.

No. 1 B.

1, Rhododendron album elegans; 2, Rhododendron Chas. Dickens; 3, Rhododendron Everestianum; 4, Rhododendron maximum; 5, Kalmia glauca; 6, Kalmia latifolia; 7, Vaccinium macrocarpon; 8, Berberis aquifolia; 9, Daphne Cneorum; 10, Evonymus radicans; 11, Iberis sempervirens; 12, Leucothoe Catesbæi; 13, Andromeda polifolia; 14, Andromeda speciosa; 15, Andromeda Japonica; 16, Vinca minor; 17, Rosa lucida; 18, Desmodium; 19, Clethra alnifolia; 20, Actinidia volubilis; 21, Chionanthus Virginica; 22, Xanthorrhiza apiifolia; 23, Viburnum plicatum; 24, Stuartia pentagyna; 25, Rhodotypos kerrioides; 26, Symphoricarpus vulgaris; 27, Lonicera brachypoda.

Perennials.—Gypsophila repens, Phlox subulata and amœna. Saxifraga crassifolia, Veronica rupestris, Epimedium macranthum, Epimedium alpinum, Galax aphylla, Lilium and Crocus in variety, Chionodoxa Luciliæ, Fritillaria Meleagris, Narcissus in variety, Scilla Sibirica, Galanthus nivalis.

No. 2 B.

1, Rosa rugosa; 2, Rosa lucida; 3, Rosa multiflora; 4, Pyrus Japonica; 5, Pyrus Maulei; 6, Magnolia stellata; 7, Magnolia Soulangeana; 8, Magnolia conspicua; 9, Spiræa Bumalda; 10, Spiræa Japonica alba; 11, Spiræa Van Houttei; 12, Spiræa Cantonensis; 13, Spiræa Japonica Fortunei; 14, Chionanthus Virginica; 15, Calycanthus floridus; 16, Clethra alnifolia; 17, Viburnum cassinoides; 18, Viburnum dentatum; 19, Viburnum plicatum; 20, Symphoricarpus vulgaris; 21, Forsythia suspensa; 22, Forsythia Fortunei; 23, Actinidia volubilis; 24, Diervilla rosea; 25, Rhodotypos kerrioides; 26, Xanthorrhiza apiifolia; 27, Berberis Thunbergii; 28, Akebia quinata; 29, Hypericum Kalmianum.

Perennials.—Aster Novæ Angliæ, Cassia Marilandica, Eupatoreum ageratoides, Helianthus decapetalus, Helianthus orgyalis, Lychnis Chalcedonica, Monarda didyma, Anthemis tinctoria, Asclepias verticillata, Convallaria majalis, Dicentra eximia, Epimedium in var., Euphorbia corallata, Gaillardia in var., Geranium sanguineum, Hesperis matronalis, Pæonia in var., Hydrophyllum in var., Mitella diphylla, Vinca minor.

of its transformations on the tree, and so long as there is sufficient foliage to provide food its progeny have no occasion to leave it, although many of them instinctively do go in search of new trees upon which to deposit eggs. But if trees are cleared of Bag-worms, a band of the "insect lime" will prevent migrants from ascending them from other trees and shrubs. Fortunately, this insect is rare in Massachusetts. The Tussock Moth can also, and usually does, complete the round of its existence upon the tree on which the eggs are deposited. The females being wingless, well-kept bands of the "insect lime" would prevent either the females or the caterpillars from ascending trees which were already entirely free.

In regard to the Fall-web worm, one can hardly see how the "insect lime" will prove effective. The female moth flies freely, and when the caterpillar is ready to become a chrysalis it is as likely to drop directly to the ground as to attempt to crawl down the trunks of the trees where the band of lime would prevent its passing over. A few might be destroyed in this way, but the proportion would probably be small.

The use of the "insect lime" for covering the eggs of the Gypsy Moth would, no doubt, be effectual if thoroughly applied, but it would seem to be quite as simple and expeditious, or economical, to scrape off, collect and finally burn the egg-clusters. The kerosene torches used in burning the eggs at Medford last year, must, doubtless, cause injury to tender-barked trees.

The value of the "lime" in preventing caterpillars from crawling up or down the trees can be easily understood and appreciated.

Arnold Arboretum. *J. G. Jack.*

Foreign Correspondence.

Orchids at Clapton.

Saccolabium bellinum.—This is one of the prettiest of the many described species of Saccolabium. It is remarkable in being one of the smallest in habit and at the same time the largest in flower. It was introduced from Burma in 1884 by Messrs. Hugh Low & Co., Clapton, when it was named and described by Reichenbach as "one of those elegant little beauties one may delight to look at after being tired of monotonous grandeur." The plants do not exceed six inches in height; the leaves are narrow, about six inches long, dark green and herbaceous in texture. The racemes are produced at the base of the plant, and bear from three to eight flowers in a compact cluster; each flower is an inch across, fleshy, the sepals and petals yellow, with brown blotches, the lip with a large cup-shaped sac, fringed round the margin, and colored white, with red or purple blotches. I lately saw about five hundred plants of this species in the Clapton nurseries, many of them in flower, some darker than others, but every one charming in form and color. I know from experience that this Saccolabium is easy to cultivate, a plant which has been in the Kew collection since 1885, having flowered every year since. Many Saccolabiums are not nearly so well behaved in the garden as this.

Dendrobiums.—A magnificent collection of these beautiful Orchids may now be seen at the same nurseries, where the cultivation of this genus is exceptionally well done. Such species as *D. Bensonæ*, *D. Brymerianum*, *D. luteolum*, *D. crassinode*, *D. Wardianum*, *D. lituiflorum*, *D. Devonianum*, *D. thyrsiflorum* and *D. suavissimum* are grown in enormous numbers, and Mr. Low informed me that his success with these plants was the result of a radical change of treatment for them in the growing season. This consisted of exposure to almost all sunshine, a constantly saturated atmosphere, and no ventilation. The most important item is this last. Mr. Low found that closeness, with a maximum of light, was exactly what the Dendrobiums reveled in. They kept free of insect pests, and they were not attacked by "spot." The growth was rapid, and became thoroughly ripened before winter set in; consequently there was a good set of flower-buds.

Phalænopsis.—These plants have always been exceptionally well grown at Clapton, where, in a favorable winter, it is not an unusual occurrence for from five to eight hundred spikes of bloom to be expanded at one time. This winter has, however, been very destructive to the early-flowering species, such as *P. amabilis* and *P. Stuartiana*, of which scarcely a spike escaped at Clapton, although many hundreds were produced. In the case of *P. amabilis*, Mr. Low retrieves the loss of the first spikes by cutting them off to within six inches or so of the base, which induces them to develop a secondary spike, and as this matures later in the year the flowers are saved. Still it is a great strain on the plants to force them to produce two spikes instead of the normal one.

P. Schilleriana, however, is magnificently in flower at Clapton now, over 500 fine spikes of flowers being fully open at the time of my visit. The health of the plants is perfect, all, from the smallest with leaves no larger than a finger-nail, to the grand specimens with leaves a foot or more in length, being perfectly happy. The treatment for these plants at Clapton differs somewhat from that usually followed. Mr. Low thinks that a large percentage of the Phalænopsis that die in gardens are killed by too dry treatment. A light house where the winter's sunlight may be made the most of, sufficient heating power to maintain a temperature not lower than seventy degrees even in severe weather, an earthen or cinder floor and a constantly saturated atmosphere all the year round—these are the main features of the Clapton treatment for Phalænopsis. Mr. Low says the sphagnum about these plants should never be allowed to even approach dryness. Baskets are used for all the kinds, and they stand upon open wooden stages about two feet from the glass. The house is kept moist by frequent damping down. There are two large span-roofed houses devoted to these plants at Clapton, the principal species cultivated being *P. amabilis*, *P. grandiflora*, *P. Schilleriana*, *P. Stuartiana*, *P. rosea* and *P. gloriosa*.

London. *Visitor.*

New or Little Known Plants.

New Orchids.

Odontoglossum luteopurpureum, var. Amesiana, Hort., is a very handsome variety, for which Messrs. F. Sander & Co., of St. Albans, received a first-class certificate from the Royal Horticultural Society on March 10th last. It is described as having flowers of a pale yellow-green color, unlike that of any other Odontoglot.—*Gardeners' Chronicle*, March 14th, p. 334.

Cypripedium × Ceres, N. E. Br., is a handsome hybrid, derived from *C. Spicerianum* fertilized with the pollen of *C. hirsutissimum*, in the collection of D. O. Drewett, Esq., of Riding, Mill-on-Tyne. It resembles the pollen parent generally, though the dorsal sepal and staminode show characters unmistakably derived from the seed parent.—*Gardeners' Chronicle*, March 21st, p. 360.

Cypripedium × Juno, N. E. Br., is a charming little hybrid, raised in the collection of D. O. Drewett, Esq., of Riding, Mill-on-Tyne, between *C. callosum* and *C. Fairieanum*, the latter being the pollen parent. It bears a strong resemblance to *C. Farieanum* in almost all its characters, but especially in the shape and color of the flower. It appears to have arrived at the flowering stage in less than three years from the time the seed was sown.—*Gardeners' Chronicle*, March 21st, p. 360.

Cypripedium × Pallas, N. E. Br., is a hybrid, raised in the same collection as the two preceding ones, between *C.* × *calophyllum* (itself a hybrid from *C. barbatum* and *C. venustum*) and *C. callosum*, the latter being the pollen parent. The upper sepal is white, with numerous green nerves, as in the seed parent, to which in other respects it bears a considerable resemblance.—*Gardeners' Chronicle*, March 21st, p. 360.

Waluewa pulchella, Regel.—Described as a new genus of Orchids, received from the province of Minas Geraes, Brazil, by Herr Lietze, and which flowered in the Royal Botanic Garden at St. Petersburg. It is dedicated to Count P. A. Wahijew. It appears to be closely allied to *Leochilus*, but bears a strong resemblance to certain species of *Oncidium* of the *O. pulus* group. The flowers are small, the sepals greenish yellow and unicolorous, the petals yellowish, barred with purple; the lip also has some purple markings on a yellowish ground. The linear disc is minutely papillose.—*Gartenflora*, xl. (1890), p. 89, t. 1341, fig. 1.

Kew. *R. A. Rolfe.*

Cultural Department.

Hardy Shrubs for Forcing.

Many of our hardy shrubs can be forced, under a moderate temperature, into early bloom in the greenhouse. In order to get the best results with the least trouble, shrubs for forcing should be selected from the early-flowering kinds. The forcing should be done moderately and gradually—that is, the plants should first be placed in a cool greenhouse or cool part of a greenhouse until growth has fairly begun; later, if desirable, they may be introduced into a warmer temperature, where growth and development of the flowers may be hastened.

When brought into a warm temperature too suddenly the buds are liable to become injured or blighted, and a dry at-

mosphere is also injurious. Plants intended to be forced may either be lifted during the previous spring and placed in tubs or pots, where they continue growth during the summer, or fibrous-rooted kinds may be lifted with an adhering ball of earth in the late autumn, and, together with the potted plants, be placed in a pit or cellar until wanted. Plants for exhibition or ornament are generally taken up and potted long before being forced, but autumn lifting usually answers where only blossoms are desired. Where the winters are not severe some of them may be taken directly from the ground in mild weather, but where the earth is liable to remain frozen it is best to have all out of reach of frost. Cuttings of some kinds may make good, compact little flowering plants in the course of a few months' growth.

Deutzia gracilis and *Rhododendron* (*Azalea*) *mollis* and others are now almost universally grown for winter forcing, and

Fig. 34—A Cottonwood Tree (*Populus monolifera*) on the banks of the Kansas.—See page 182.

the Lilac has come into quite general use among florists. The Flowering Almond, the Peaches and Cherries, and, among others, *Prunus Pseudo-cerasus*, force well, and the last is very pretty and lasts in bloom a long time, although it cannot be counted a florist's flower.

Well-grown grafted plants of varieties of the beautiful flowering Japanese and Chinese Crab Apples are easily brought into early bloom if planted the preceding year in tubs or pots, and not forced into too rank growth. The flowers of our Chokeberry (*Pyrus arbutifolia*) come out well under artificial heat, and the deep green shining leaves are attractive, although the plants have a rather straggling habit.

An interesting plant for early forcing is the very dwarf form of the Japanese Quince, which is known as *Pyrus Maulei*, and which bears a profusion of orange-scarlet flowers. It is better than many of the forms of *P. Japonica*, because of its more compact habit and its more numerous and slender branchlets.

Staphylea Colchica is now quite extensively cultivated and forced for commercial purposes, and, when well grown, its fragrant tuberose-scented flowers are among the most beautiful to be obtained from forced shrubs. This species surpasses any of the other hardy Staphyleas for forcing purposes.

Among many others of its genus *Rhododendron Vaseyi* blossoms as charmingly when hastened in the greenhouse as it does when left to bloom in the open air with the coming of warm weather.

Well-grown and full flower-budded plants of our American Laurel (*Kalmia latifolia*) may be forced into one of the most beautiful objects of winter decoration. The dark evergreen leaves are always attractive, but when the clusters of white or pinkish flowers appear, few greenhouse plants can compare with the Kalmia. Under the influence of a moderate artificial heat, the Rhodora does not take long to open its buds and display its beautiful, rosy purple flowers on its naked branches. It probably would not pay to force this for commercial purposes, but a few plants may give much pleasure to the amateur. This is also true of the Mayflower, or Epigæa, clumps of which may be moved from its native woods in the autumn, and, being transplanted into boxes or pots, the flowers may be produced, whenever desired, throughout the winter. *Andromeda floribunda* and *A. Japonica* are naturally so early-flowering that it is an easy matter to force them, and they make admirable decorative plants in winter. It takes longer to get flowers from *A. speciosa*, but they are among the loveliest of the genus, and well worth waiting for.

Among the showy-flowered hardy Daphnes the blossoms of *D. Mezereum* are very easily brought out, and *D. Genkwa*, from Japan, gives promise of being one of the most interesting plants of its kind for forcing.

Many of the Spiræas are useful for their winter bloom.

The flowers of *S. Thunbergii* are easily brought out, but a forced specimen of this shrub usually looks disheveled and unsatisfactory, but *S. Cantoniensis* (*Reevesiana*) and the plant known in nurseries as *S. Van Houttei* do better.

Grafted plants of the Japanese Red-bud (*Cercis Chinensis*) will be found much better than our native species, inasmuch as the flowers of the former are earlier, larger, and even brighter in color. Dwarfed and well-grown plants of the common Chinese Wistaria are very handsome when forced early, and it is a species which seems to do very well under these conditions. Some of the hardy species of Cytisus are well worth the trouble of bringing into early bloom.

The Forsythias are among the plants which very readily and quickly come into flower under the stimulus of gradual heat. Only those with numerous flower-buds should be selected, and *F. suspensa* and the form sold as *F. Fortunei* will be found more satisfactory for forcing purposes than *F. viridissima*, which they also excel for garden culture. The shrubby *Magnolia stellata* will easily produce its fragrant white blossoms if the buds are well developed. Among later-flowering hardy shrubs which have come into extensive use for forcing purposes is that long known as *Viburnum plicatum*, and which is in every way a much better plant than the old-fashioned Snowball-sterile or form of *V. Opulus*.

That the latest as well as the earliest of our flowering shrubs may be profitably forced is shown by the fact that *Hydrangea paniculata grandiflora* is now grown for commercial purposes in greenhouses. While almost any shrub may be forced into growth before its due season, only a limited number of kinds will be found profitable to the florist, while the amateur and enthusiast has a long and varied list from which he may select subjects for experiment. He will find that many of them never look as well at any other time as they do when blooming out-of-doors in their proper season.

Jamaica Plains, Mass. *J.*

Hardy Narcissus.

THE article on Hardy Narcissus, in Garden and Forest for March 25th, was interesting and timely, as the first of these beautiful flowers are bursting their sheaths (*N. Scoticus* being in the lead, and showing flowers on Good Friday). Mr. Orpet's advice about due care in planting late arrivals of bulbs is sound, and the same remarks would apply to all hardy bulbs, for unless some root-action takes place before freezing weather losses are almost inevitable among the hardiest of them. But there may be an exception taken to the advice to plant deeply in our climate, if this means the climate of our eastern states. That detail seems to me to depend, as with other plants, very much on the garden in which they are to be planted. In my own it is not possible to grow Narcissi deeply planted, neither have I found it necessary so to plant them to grow them successfully and produce flowering bulbs for the following season. As a matter of convenience, where there is a proper depth of suitable soil, deep planting may in some cases be desirable, but it is doubtful if it is necessary in any case. My soil is a heavy retentive one, nine to twelve inches deep, with a clay hardpan, and deep-planted bulbs simply deteriorate to the diameter of a lead-pencil. Planted from one to three inches deep, they thrive as well as one could wish. If an open fall allows the foliage to appear above ground, as it often does, little or no damage seems to be done by following frosts. In December of 1889 I bought a lot of *N. Horsfieldii* too late to plant out, and planted them in three-inch flats in light potting soil. They were lightly watered and placed in a rather open cold frame through the severe weather, and bloomed in the open. They were carefully ripened off, and, the offsets being removed, were planted at a suitable time in the border. They have been blooming freely since April 15th. This experience would seem not only to confirm Mr. Orpet's theory that late-planted bulbs, if properly grown on, would prove satisfactory, but also that very shallow planting is sufficient; in this case only enough soil being used to actually cover the bulbs.

While from necessity a second crop is always grown over my bulbs, I think it is somewhat at the expense of the bulbs; and where space is not important and bulbs are valuable, better results will be had if the beds are left exposed and without a second crop. If this is a matter of necessity, plants which require little moisture or are deep-rooting, like annual Poppies, seem most desirable for such a position. Of course, in garden matters, one only judges from his own glebe and experience. Fortunately, many plants are not as particular as the gardener, and will grow under vastly differing circumstances, so that general rules do not often seem applicable.

Elizabeth, N. J. *J. N. Gerard.*

How to Make a Wild Garden.

IF we have only a few feet of ground in some shady nook, on the north side of a building or beneath the shade of trees, we can have a constant succession of flowers from early spring until late autumn. And to all lovers of flowers this wild nook will be more enjoyable than a prim, conventional garden of florist's flowers.

The wild garden will be vastly more satisfactory if it comes by slow growth. It should never be made in haste, but as we have time now and then in any season of the year to wander amid Nature's groves and gardens and note how the wild things which we desire grow, and also notice their surroundings and the trees which overshadow them, we shall be better prepared to know with what we can best succeed.

There is but little difficulty in growing many of our earliest spring flowers. The Hepatica, the Blood-root, the Wind-flower, the Spring Beauty, the Trilliums and all of our lovely Violets will grow almost anywhere in good garden soil. But there are others which require skill and patience to make live and thrive after being removed from their native haunts.

Perhaps if I give some account of my own failures and successes with wild plants it may help those who wish to secure some of these shy woodland gems. In my wild garden I have some shady places where I concentrated my skill on some of the most difficult of our wild flowers. One of these places is an irregular spot only about fourteen feet the longest way and about ten feet in the widest part. It is situated between three trees which form a kind of triangle,—a large Oak, the body of which is covered with English Ivy, mingled with variegated Evonymus, and an old Pine (*Pinus rigida*) mingles its leaves with those of the Oak, and a Trumpet-creeper has climbed up its rugged sides to its very top, showing clusters of bright scarlet flowers among the deep green pine-needles; the other tree is a Cedar with branches nearly to the ground. This little

spot is the most attractive place in my garden, almost more to me than all the rest of the half-acre devoted to wild plants. It is wonderful how many things grow in this wild spot. From early spring until late autumn it is never without flowers.

Among the first things to greet me in spring are the lovely blossoms of the Trailing Arbutus or May-flower, not stingy little clusters of bloom, but large compact bunches of flowers. I have had many failures with this charming plant, but at last have succeeded in establishing it. I found a fine patch of the plants in the woods, under a Pine-tree, and removed quite a large section of earth with all of the other things that were growing on it, and planted all beneath the old Pine in my garden. It has now bloomed three seasons, and is spreading and growing all the time. Other evergreen trailers are also here. The little Twin-flower (*Linnæa borealis*) is among my treasures, and our little Partridge-berry (*Mitchella repens*) grows luxuriantly. Its small shining leaves, strung along in pairs, are pretty the entire year, and in June it is covered with small pink and white flowers, succeeded by the double berries, which turn scarlet as they ripen, remaining on the plant until the following season, making it as attractive in winter as in summer. Another little plant is the Dalibarda, a low, creeping perennial belonging in the Rose family. With us—in southern New Jersey—the leaves are nearly or quite evergreen, and its pretty white flowers last from June until August. The spicy, aromatic Wintergreen flourishes among the rest, and very pretty it looks in winter, with its shining leaves and bright red berries.

Scattered among these trailers are both species of Hepatica, and the Blood-root, and Spring Beauty, and Wind-flower, and the Wood-sorrel (*Oxalis violacea*), and several species of Violets. And here, too, are some of our lovely Orchids—the Lady's-slipper, the low purplish pink one (*Cypripedium acaule*), and the fragrant yellow one (*C. parviflorum*) blossom every spring.

The dwarf perennial Larkspur (*Delphinium tricorne*), with spikes of brilliant blue flowers, and the wild Hyacinth (*Scilla Fraseri*), with a long raceme of pale blue flowers, bloom here as well as in their native home on the western prairies.

These early flowers are succeeded by several species of our low-growing Ferns, which are beautiful throughout the rest of the season. On the outer edge of this spot are larger, later-blooming plants, and also some of our large Ferns—two species of Osmunda—the Cinnamon and Royal Fern, and our Chain Ferns, the Woodwardia—both species.

The Wild Lily (*Lilium Canadense*) unfolds its nodding flowers by the side of the Ferns, with Rudbeckias and low-growing Sunflowers as companions. Some of these Rudbeckias and Sunflowers are annuals from Texas, and grow readily from seed. When planted early they commence to bloom by the first week in July and continue until frost. In August the Asters and Eupatoriums and Golden-rods begin to mingle with the Sunflowers, making a brilliant display.

As the Golden-rod has become our national flower, it will naturally be more noticed and sought after than heretofore; and as we have some forty or more species growing in the northern states there will be little difficulty in securing some pretty ones in every locality. One of the most desirable and earliest-blooming of all is the sweet-scented Golden-rod (*Solidago odora*). It is widely distributed from Maine to Florida, and commences to bloom here about the middle of July. The flowers are bright yellow in a one-sided, spreading panicle, and it has smooth, shining leaves, which, when crushed, give a pleasant anise odor. This species, together with some of the later-blooming ones, will give us flowers from July until October.

Those who live near the coast should not neglect the beautiful salt-marsh Golden-rod (*S. sempervirens*). It has thick, very smooth, large shining leaves, and fine large heads of bright golden flowers. Although it is a salt-marsh plant, it has become established here, some forty miles inland, as one of our wayside flowers. The seed, no doubt, has been brought and disseminated with salt-marsh hay.

Mary Treat, in the Chautauquan.

A Raspberry Trellis.—It is rare that we find a field of Red Raspberries in which due provision has been made for sustaining the canes during the bearing season. They are cut down, as a rule, in autumn to a height of three to four feet and left to winter through as they can. The damage from snow is always serious. My own loss in winter and from broken canes in summer was so great that I have adopted the following plan: I set strong cedar-stakes at the ends of rows and at intervals of twenty-five feet. To these I staple a wire, as for a Grape trellis, about four feet from the ground. Then, bringing the canes together in bunches of three or four, they are tied with soft strong twine above the wire—not on the wire, for then the cord would soon be cut by the wire. The rows being all tied, intervening and short canes are dug out. Then, with hedge-shears, the tops are cut off at a height of six feet. This height on this plan is not too great. The Raspberry likes a moist, shaded soil; and in this way it shades its own roots. In the bearing season the sides of these trellises become a wall of berries—a wonderful sight to behold. Pickers move up and down the rows quite hidden. I have described my plan with the Cuthbert and Golden Queen in view. These, in fact, are with me the only standard first-class raspberries for market as yet. The Turner must be grown very thinly here, and in hills, to secure a reasonable crop. The Marlboro has succeeded fairly well as above, but with me is not a standard in any sense. Rancocas I must reject, as also Hansell, Lost Rubies and Crimson Cluster. Schaffer's Colossal does admirably on the wire, and is an enormous bearer on that plan. Black Raspberries, in general, had probably best be cut low and grown in stout heads.

Clinton, N. Y. *E. P. Powell.*

Mildew on Sweet Alyssum and Radish.—Among our worst mildews are the members of the genus Peronospora, and among the Peronosporas there is no species equaling the *Peronospora parasitica* in breadth of range. Usually a species of these downy mildews is confined to one or a few of the members of the same host genus, but the one named above is known to grow on forty-seven species belonging to twenty-seven genera. These genera, however, all belong to the large family of *Cruciferæ*, whose members are easily recognized by their similar flowers, pods, and even their peculiar taste. When a mildew will thrive upon a large number of hosts the presence of one host-plant will furnish the breeding-ground and produce a stock within a greenhouse for any other susceptible plant. In a greenhouse recently visited the beds of young Sweet Alyssum showed many pale and sickly plants, which were found badly infested with the downy mildew above mentioned. Radishes had been grown under glass in large quantities, and were perhaps more or less attacked by the same fungus, and while it inflicted little damage upon the short-lived Radish-plant it no doubt multiplied there and spread to the Alyssum near by, from which its destruction may become considerable. Gardeners need to know the kinships of plants, and if one crop is mildewed it is not advisable that another closely related to it should be grown by its side.

Rutgers College. *Byron D. Halsted.*

Distributing Weeds.—Novices need a warning against *Ipomœa pandurata*, "Man of the Earth," which has been rechristened by the seedsmen the "Hardy Moon Flower." Did any one ever get to the bottom of the root of an old plant? I have tried it, but always found it growing stouter as I dug, until I gave it up, and had forty plants come up in place of the one. A worse weed is now advertised as "California Rose," and with the greatest apparent sincerity the sellers give as the botanical name of this "Rose," *Calystegia pubescens*. It may perhaps be one of the California Calystegias, but the probability is that it is *Calystegia Sepium*, var. *pubescens*, the vilest weed which ever infested a garden. I have a note to-day from a lover of flowers who boasted of her new treasure, the California Rose, which she is growing from seed. I at once warned her not to plant it in her garden.

Our common "May Pop," *Passiflora incarnata* is a much prettier plant and flower than any of the *Convolvulaceæ*, but, in this latitude it has the same fault of the Bindweeds, and becomes a troublesome weed in cultivated fields. Perhaps it may not be so bad at the north, but it is well to watch all these things.

North Carolina College of Agriculture, Raleigh. *W. F. Massey.*

Primroses.—There are no more charming plants in spring-time than these, and it is little wonder that they have been garden favorites from time immemorial. For some reason there seems a quite general impression that Primroses are flowers of the shade and dampness, and that under our brazen skies there is so small a chance for success that there is no use in attempting their culture. This may be true of *Primula veris*, the native English Primrose, for there are probably very few such haunts in the United States as that in which this plant was reported by one of your correspondents to have become naturalized, and in the garden it is not long-lived. But within the last decade or two some excellent strains of hybrid Primulas have been secured by the painstaking care of a few florists, and

these prove very satisfactory garden plants in our climate. Among a number of strains Dean's seem quite the best, and leave little to be desired. The plants are vigorous and free-flowering, the flowers are large and well colored, without objectionable tints. Seeds (which may be had of leading dealers) sown now will produce blooming plants next spring. My plants of these are best in a raised border some six feet from the south wall of the dwelling. They receive the full rays of the sun all day, without the slightest shade at any time, and apparently never suffer from the heat. In the winter they remain without any covering, as this is apt to rot the crowns. During the winter many of the leaves are usually scorched by the frost, but new ones are quickly put out, and now, as they are coming into bloom, the plants look very fresh, vigorous and much more stocky and in character than any plants coddled in a frame. In three other borders facing south and west, but more exposed, and not so well drained, the lines of Primroses do not grow nearly so vigorously or bloom as early. If any of your readers have had only moderate success with these plants the location may have been at fault. With these hybrids and a good strain of *P. elatior* (Polyanthus) a long succession of beautiful flowers may be had with little care, and soon a superabundance of plants, as they increase rapidly when divided.

A Taurian Muscari, received from Asia Minor, proves on a second year's trial a valuable addition to the early spring border. This Grape Hyacinth starts into growth in early winter, putting forth leaves which are long, narrow and prostrate. The bloom slowly appears as soon as the ground loosens, and this year from early February till now a colony of a hundred or more plants has been a cheerful spot in the border. The flowers are light purple (florist's blue) on the apex of the cluster, and shade to deepest purple at the base on stems about six inches high. Each small bell-like flower is constricted at the mouth, where it is furnished with a fringe of white. The blooms are not injured by hard weather. The list of available very early blooming plants is lengthening rather rapidly, and this may be considered a desirable addition to the earliest class.

Arabis alpina.—This Rock Cress is one of the best of the hardy low-growing early-blooming plants where white flowers are desired. Its simple pure white blooms are about three-fourths of an inch in diameter, and very freely produced. In broad masses it is especially attractive. It precedes *Phlox subulata* in blooming, and like this is fond of a location not too wet. Plants of this may be had of most hardy plantsmen or it may be secured readily from seed.

Elizabeth, N. J. *J. N. G.*

Correspondence.

Colorado Conifers for Eastern Planting.

To the Editor of Garden and Forest:

Sir,—Allow me to endorse your remarks, in connection with Mr. Moon's letter, on page 153 of Garden and Forest for April 1st, 1891. An attempt to grow California trees north of the latitude of Philadelphia will be almost sure to result in disappointment. But in making this statement we must use the words "California trees" only in a geographical sense, and not forget the great difference in hardiness that exists between the same species on the Pacific slope of the Rocky Mountain range and those on the eastern slope. This difference is so great as to form separate varieties of the same species, as far as the manner of growth is concerned.

In Colorado we have *Pinus ponderosa*, *Pseudotsuga taxifolia*, *Abies concolor* and *Picea pungens*, all growing in thick forests on the mountain-sides, and enduring a climate far more severe in every way than around New York City. In winter there are sudden storms of snow and sleet, with the thermometer falling as low as thirty degrees below zero, followed by days of almost summer heat, with scorching sun and drying winds. In summer there are long seasons when no rain falls to provide their needed moisture. And these trees are no stunted, twisted trunks with a few branches, struggling for a bare existence, but grand and noble specimens of tree-life, towering in lofty grandeur to a height of nearly 200 feet. I have seen single isolated specimens of *Abies concolor*, rising like towers, full of light and shade and beautiful color, which could not be excelled anywhere as types of vegetable life. There, too, the rich deep green of the Douglas Spruce, with its soft foliage, and the bright, warm tints of the Engelmann's Spruce, give a wonderful attraction to the Colorado forests. No one need doubt the perfect hardiness of any tree that grows in Colorado, Wyoming or Montana. This has been generally recognized by nurserymen who grow forest-trees in quantity, and they will advertise the trees above named as grown from Colorado seed. Let any planter be sure his trees are derived from seed gathered in the states named, and he need have no fear of the result, but rest sure that, accidents barred, they will live to reach a magnificent maturity.

Colorado Springs, Col. *Geo. H. Parsons.*

[The conifers of Colorado, so far as it is possible to judge of them from an experience which does not extend beyond twenty-five or thirty years, are well suited to withstand the climate of the northern Atlantic states, although, as we have insisted again and again, it is not safe to pronounce upon the capacity of any tree to flourish in any locality until it has been grown in that locality in considerable numbers during a period equal to the life of an individual of the species. Of the trees mentioned by our correspondent, plants of *Pseudotsuga taxifolia*, *Abies concolor* and *Pinus ponderosa*, raised from Colorado seed, are absolutely hardy in the most exposed situations in New England, while plants of the same species raised from seed gathered on the Pacific side of the continent either fail entirely in this part of the country or are very unreliable. Judging by what we now know of these trees, the Pseudotsuga from Colorado is the most valuable exotic conifer which can be planted in the northern states; while *Abies concolor* is the hardiest and most beautiful of all the Silver Firs here. *Picea pungens* and *P. Engelmanni* are both peculiar to the dry interior part of the continent, and do not reach the humid coast-region. They are both hardy in the east. *Picea pungens*, the so-called Blue Spruce of nurseries, is already planted in large numbers, and in its young state is very beautiful. The largest plants in the east begin, however, to show indications of failure in their lower branches, and those persons who have watched these trees most closely in cultivation feel that they may not maintain their early promise—a view which is strengthened by the fact that in Colorado this tree loses its lower branches early, and is much more beautiful in its young state than it is later in life.

Picea Engelmanni, as it appears in the elevated forests of Colorado, is probably the most beautiful of all the Spruces. Transported, however, to the sea-level, it grows very slowly, like all alpine trees, and it is not probable that it will be very much esteemed as an ornamental tree in the eastern states, but as it is very promising in the extreme northern part of Europe, it will doubtless prove a valuable tree for the cold regions of Canada. It is one of the first conifers to start into growth in the spring, and for this reason is worthless in countries like England, where spring frosts prevail.—Ed.]

The Home of Certain Syringas.

To the Editor of Garden and Forest:

Sir,—Not long ago an article in Garden and Forest discussed the different species of Syringa cultivated in gardens, and in this article it was stated that the native country of *Syringa Josikæa*, Jacq., was unknown, and that all the plants in cultivation have been derived from a single specimen found in a garden in Hungary.

The statement is inexact, and the country where this species grows naturally is well known. It was discovered in 1830 by the Baroness Josika (née Craki) in Transylvania, not in a garden, but on the rocky banks of the river Sebes, in Clausenberg, and the younger Jacquin, who named the plant in honor of the discoverer, showed specimens of it at the Congress of Naturalists, held that year at Hamburg, inserting the first diagnosis of his species in the account of this meeting published in the *Bot. Zeit.* (1831, p. 67). Reichenbach, in his "Flora Germanica Excursoria," published in 1830–32, gave characters of *Syringa Josikæa*, with an indication of the region where it had been found, and the same author in his admirable "Iconographia of the German Flora" publishes a figure of it. In more recent years various Hungarian collectors have found the plant in its native country and have distributed specimens.

In order to remove any doubts which may still exist upon the occurrence of *Syringa Josikæa* growing spontaneously in north-eastern Hungary, I have written to some of my Hungarian correspondents, Professor Borbàs, at Buda Pesth, and others. They give me exact and complete information with

regard to the discovery of the plant and the localities where it grows, which can leave no possible doubt with regard to its spontaneousness in Europe. I am indebted to the kindness of Mr. Carl von Flatt, Judge at Elest, near Grosswardein, the country of *Syringa Josikæa*, for a list of the ten known localities where it is known to occur, and which extend over the four counties of north-eastern Hungary—namely, Kolos, Bihar, Ung and Màrmaros. It is in the first of these, Kolos, that the plant was discovered on the river Sebes.

S. Josikæa grows everywhere near the water at an altitude varying from three hundred to four hundred metres above the sea, between 46° and 48° of north latitude and between 40° and 42° of east longitude. Mr. Victor Janka describes (*Ostreich Bot. Zeit.*, 1885, 3, f. f.) the locality in the district of Màrmaros, where he first found it, as covered with thickets of Alder, *Rhamnus Frangula* and *Salix aurita*.

Mr. Carl von Flatt, to whom I am indebted for the bibliography * of this species, which is joined to this communication, writes: "The home of the plant growing spontaneously is in the primeval forests of the mountain-chain which separates Hungary from Siebenburgen. For miles and miles of the territory where *S. Josikæa* grows neither a house nor a hut is to be seen. The stations discovered by me are both in the Remetz mountain-forests; one, Lunka Kotuni (1885), furnished few specimens, but there are finer ones in Pareu Foeguczat (1886), where there are nearly a thousand plants growing. Probably Kitabel had heard of this plant. In his manuscripts, preserved in the National Museum at Buda Pesth, there is a drawing with the following note:

"'*Syringa prunifolia*, Kit. Ita interea pro conservanda memoria nomino quæ ad viam Munkacsino-Leopolim (Lemberg) ducentem inter Felsö-Hrabonicza et Pudpolock in cottu Beregh crescit, foliis que Pruni distincta, referente Dre Bulla.'

"Studel, in his 'Nomenclator Botanicus,' gives under *S. Josikæa* as a synonym, *S. vincetoxifolia*, Baumg. Where he found this I cannot tell, for Baumgarten did not publish such a name."

If *S. Josikæa* is to be considered an escape from cultivation, what known species can it have been derived from? Certainly there does not exist in Europe any species from which it can have been derived, a reason sufficiently important for rejecting all idea of garden origin. And, you know, Monsieur Franchet has suggested the identity of *S. Josikæa* and *S. Emodi* of the Himalayas ("Observations sur la Syringa du Nord de la Chine"), but certainly no one had ever cultivated the Indian plant in Hungary previous to the year 1830, when *S. Josikæa* was discovered, and even to-day it is very doubtful if a single specimen of *S. Emodi* can be found in all that district.

Permit me to call attention also to an error in Garden and Forest with regard to the native country of *Syringa vulgaris*. That plant does not grow wild in Piedmont, and its most western station is southern Hungary, in the neighborhood of the Danube. If more western stations are given in some Floras, it is for plants which have escaped from gardens. In this country *Syringa vulgaris* maintains itself easily, and for a long time, wherever it has been planted, and, therefore, sometimes appears spontaneous or sub-spontaneous, although it is not indigenous here. This is the case, too, with *Philadelphus coronarius*, which is often found about the ruins of buildings which have been abandoned for more than half a century, furnishing the last trace of ancient gardens.

Bâle, Switzerland. *H. Christ.*

* Syringa Josikæa, Jacq. fil.

Nemzeti taésalbodó (1830), p 344.—*Erste quelle!* (Eine ungarische Zeitschrift.)
Reichenbach.—"Flora Germanica excursoria" (1830), i., p. 432. (Zu spät!) *Flora* (Regensburg), xiv. (1831), i., p. 67.
Reichenbach.—"Plantæ criticæ" (1831), n. 1049.
M. Fuss.—In "Joh. Chr. Gottl. Baumgarten Enumerationis stirpium Transsylvaniæ Indigenarum Mantillæ," i. (1846), p. 2, n. 15.
Ferd. Schur.—"Enumeratio plantarum Transsylvaniæ" (1866), p. 451.
Aug. Nielreich.—"Anfzählung der in Ungarn u. Slavonien bisher beobachteten wildwachsenden Gefässpflanzen" (1870), p. 155.
Decaisne.—"Monographie des Genres Ligustrum et Syringa." In *Nouvelles Archives du Museum d'Histoire Naturelle*, xii. (1879), pp. 1–45.
Dr. Simonrai.—In *Terméfzetpajzi fuzetek*, v. (1880), p. 44. (Ungarisch.)
Dr. V. v. Janka.—In *Oesterreichische botanische Zeitschrift*, 1885.
M. A. Franchet.—"Observations sur les Syringa du Nord de la Chine." (*Bulletin de la Société philomatique de Paris* (1885), Séance du 25. Julliet, pp. 1–7.)
C. v. Flatt.—A Syringa Josikæa Biharban, in *Erdéfzeti Lapok* (1886), xxv., pp. 141-150. (Ungarisch.)
J. v. Csató.—In *Oesterreichische botanische Zeitschrift* (1886), p. 249.
C. v. Flatt.—A Syringa Josikæa, Jacq. fil. faji ôallóságáról, in *Erdéfzeti Lapok*, xxvi. (1887), pp. 568–581. (Ungarische.) Bis Dato der Ausschliessliche Artikel.
A. Michalus.—In *Erdépeti Lapok*, xxvi. (1887), pp. 982, 983. (Ungarisch.)
Dr. A. Simonkai.—In *Nagyvárad terméfxetrajza* (1890), pp. 116–121. (Ungarisch.)
Bluff und Fingerhuth.—"Compendium Floræ Germaniæ," i., 1, p. 15.
Dr. Moritz Willkomm.—"Forstliche Flora von Deutschland und Oesterreich," p. 566.
M. Fuss.—"Flora Transsylvaniæ excursoria" (1866), n. 1997.

Icones.—*Syringæ Josikæa.*

Jacquin.—"Eclogæ Plantarum," fol. tab. col. (1844), tab. 167.
Reichenbach.—"Plantæ criticæ" (1831), viii., 780, n. 1049.
Curtis.—Botanical Magazine, series iii., 60–3278.
Edwards.—The Botanical Register, xx., 1733, tab. col.
Maund.—The Botanist (1839), i., 24.
Magyvárad terméfzetrojza (1890), p. 117. (Ungarisch.)

Recent Publications.

Fungous Diseases of the Grape and other Plants, and Their Treatment. By F. Lamson-Scribner. J. T. Lovett Company, Little Silver, N. J. Small 8vo, pp. 134.

The knowledge of fungous diseases of plants has, within comparatively few years, been supplemented by so many valuable practical experiments on the relative merits of different chemicals in checking their growth, and by the invention of machines for applying them in the most efficient way, that there was need of a compact popular summary of the subject for the use of farmers and fruit-raisers. This is afforded by the little book of Professor Scribner, which gives a popular account more especially of the principal rots, mildews, blights and other diseases of the Vine, followed by shorter chapters on various diseases of Apples, Pears, Cherries, Plums, Peaches and Raspberries. The main object of the author is to show the best method of applying remedies, and the descriptions of the Fungi which cause the various diseases are designed to enable those who are not well informed with regard to Fungi to recognize with as little difficulty as possible the distinctive characters of the different diseases as a preliminary step in applying the remedies. The compass of the book prevents any extended account of the different Fungi, but those which affect the Grape are given with sufficient fullness for all practical purposes. A more extended introductory chapter on the general characters of Fungi would, however, have served a useful purpose. A considerable number of woodcuts give the gross and microscopic appearance of the Fungi and the appliances for sprinkling. It is to be regretted that the figures are not numbered consecutively, since the irregularity of the numbering makes back reference difficult. On the ground of good taste, too, the caricature which passes as a portrait of the author in the frontispiece had better have been omitted.

The work is to be recommended to the large number of persons who need a summary of this important subject with a view to making a practical application of the knowledge acquired.

The Nursery Book. A Complete Guide to the Multiplication and Pollination of Plants. By L. H. Bailey. New York: Rural Publishing Company.

This manual offers a sufficiently full account of the usual methods of propagating and crossing plants, and it will be a convenient and useful reference not only for amateurs, but for nurserymen who are familiar with only a few branches of their business. The great portion of the book is taken up with a list of plants arranged in alphabetical order, with an explanation of the methods of multiplying each one. We know of no such complete list within anything like the compass of this volume. An admirable feature of the hand-book is the ordinal index, which groups together all the references to the plants in a given family. If any plant chances to be omitted from the nursery list, or if the reader desires to learn more about the method of propagating some plant included in the list, he can consult what is said of every other plant in this natural order, and undoubtedly will find some information which will prove of value.

The explanation of the different methods of grafting, budding, layering, etc., are sufficiently clear and complete, but the cuts which were intended to illustrate these methods are not nearly as good as the text; and it seems to us that the words "graftage," "seedage," "cuttage," etc., with which Professor Bailey has attempted to enrich the English language, were hardly worth coining.

Notes.

Mr. Charles Dudley Warner's articles on Southern California, recently printed in *Harper's Magazine*, have been issued in book form under the title, "Our Italy."

The California State Board of Horticulture has published an illustrated pamphlet, written by Mr. M. B. M. Lelong, and called "The Orange from Seed to Grove," the object of which is to supply reliable guidance to those who intend to plant Orange-groves in that state.

Mr. Alfred Parsons, an English artist well known in this country by the books which he has illustrated in conjunction with his friend, Mr. Edwin Abbey, recently opened in London an exhibition of pictures called "Orchards and Gardens." Many pictures of famous English gardens were included, and, knowing Mr. Parsons' sympathetic feeling for such scenes,

and the refined, poetic quality of his talent, one can well believe that the exhibition was very interesting, as well as novel in character.

A new monthly magazine, called the *Modern Cemetery*, has been started in Chicago with the object of supplying useful information to cemetery superintendents and lot-owners, and of improving the taste of the community as regards the planning and conduct of burial grounds.

A correspondent in Massachusetts states that he has found in growing Tomatoes under glass that the old plants cut down, as recommended by Mr. Mathews in our issue of April 8th, do much better than young seedlings. We should like to hear from others who have tried this plan.

Dr. Lorenzo G. Yates calls attention, in the *Pacific Rural Press*, to the value of the Chocho Plant (*Sechium edule*) as a food-product. The plant is a native of the West Indies, and thrives satisfactorily in Florida. It is one of the Cucurbitaceæ, resembling an ordinary Squash in general appearance. Both roots and fruits are available as food.

The *Revue Horticole* states that our common water-weed, *Elodea Canadensis*, which had already spread widely in England, has more recently introduced itself into France to such an extent that many streams are now seriously obstructed by it. In the canals of Belgium it is also proving a conspicuous source of trouble, and the same bids fair to be the case with another American immigrant, the little moss-like, floating *Azolla Caroliniana*.

Last week the Cornelian Cherry, the Forsythias, the early upright Honeysuckle (*Lonicera Standishii*), with our native Spice-wood and Andromeda (*A. floribunda*), comprised about all the shrubs which were blooming in Central Park. But two or three hot days in a northern spring work wondrous transformations, and no doubt the thickets will be all ablaze with the flowers of the Japan Quince and a dozen other shrubs before this paper is read.

Three of the Strawberries which were specially commended by Mr. T. T. Lyon, who tested them at the South Haven Substation of the Michigan Agricultural College, were Parker Earle, Pearl and Cloud. The first of these originated in northern Texas, the second came from southern New Jersey, and the third is a Louisiana seedling. That these plants are all promising in places so far from their origin would seem to indicate that they have great strength and adaptability of constitution.

According to *L'Art dans les Deux Mondes*, "a splendid collection of wood specimens" will be sent to the World's Fair at Chicago from Jamaica and the other West Indian islands. "These specimens . . . will have the appearance of bound books, one cover of which will be polished, while the other will show the natural aspect of the wood, and the back will retain the bark and will bear a tablet giving, in gold letters, the name of the species. This 'botanical library' will be accompanied by notices explaining the localities where the tree is found, and the qualities and uses of its wood."

In an address, delivered at a recent meeting of the Massachusetts Horticultural Society, Colonel Henry W. Wilson said that the Cocoanut Palm thrives in the Bahamas as well as in any part of the world, and this is the only district near to the United States where it certainly will. These Palms will bear in four years from planting the seed, and then fruit perennially, a leaf expanding every month, with a cluster of flowers at the base which produces from forty to sixty nuts. They keep growing the whole year, and show, at all times, the whole gamut, from flower to ripe fruit; every day the owner can pick fruit, which sell there for three cents apiece.

Colonel J. B. Clark, editor of the *Mirror and Farmer*, of Manchester, New Hampshire, offered $100 in prizes for the best essay on maple-sugar making. Forty-one essays were received, and all of them are published in the *Mirror and Farmer* for April 2d. They would make together a duodecimo volume of 250 pages, and contain a body of doctrine comprising about all that is known of practical sugar making in northern New England. The first prize was taken by E. W. Bisbee, of Moretown, Vermont; the second by H. I. Collins, of the Experiment Station, Burlington, Vermont; the third by A. S. Moody, of Moscow, Vermont, and the fourth by Timothy Wheeler, of Waterbury, Vermont.

A correspondent, writing from Kansas Experiment Station at Manhattan, under date of April 15th, says that the Forsythia was in full bloom there for the first time in a number of years. The mercury reached zero but twice during the last winter, and then remained there but for a short time. Usually this shrub shows only a few blossoms on the lower and more sheltered branches. *Lonicera fragrantissima* was also in full bloom, and seems perfectly hardy in severe winters in stiff, clayey, upland soil, but is often killed back on bottom-lands. Nearly all the *Arbor-vitæs* on the station grounds have suffered unaccountably, notwithstanding the mild winter. Trees which have endured, in former years, a temperature of twenty degrees below zero without harm now appear disfigured and dead on the north side.

A "Biographical Index to British and Irish Botanists," compiled by Messrs. James Britten and G. S. Boulger, has recently been issued in serial form in the Journal of Botany. It is now proposed to publish it in book form, and subscriptions will be received by the editors of the *Bulletin of the Torrey Botanical Club* in this city. The price will be one dollar, payable on the delivery of the volume. The list includes "all persons residing in the British Islands who have been at all prominent in the science, including collectors and patrons of botany," and gives the date and place of birth and death, the place of burial, dates of election to the Linnæan and Royal Societies, and references to sources where fuller information may be obtained.

In his proclamation, setting apart April 25 as Arbor day, Governor Russell, of Massachusetts, gives this wise counsel as to the higher uses of the celebration: "And I recommend that it be observed in ways which may serve to increase the love and respect in which we all hold the dignity and beauty of this noble land which God has given to our keeping. Let us devote the day to the establishment and adornment of public grounds, to the restoration of our wasted forests, to the repair of every defacement which makes this commonwealth less beautiful than it should be, so that we may not only have it appear the nobler in our own time, but that we may hand it down to our children the statelier and more fruitful for our care."

A circular has been prepared by Professor B. T. Galloway, and issued by the Department of Agriculture, on the treatment of nursery stock for leaf-blight and powdery mildew. The Bordeaux mixture and the ammoniacal solution, both of which preparations have been often described in this paper, are alone commended for use. The circular gives directions for applying these remedies to the various kinds of trees for the different diseases and gives illustrations of the most effective pumps and nozzles which have been devised for spraying. Apple-seedlings, it is stated, can be treated with the ammonia solution five times at a cost of eight cents a thousand, while the Plum, Pear, Cherry and Quince can be treated six times the first season with the Bordeaux mixture for fifty-five cents a thousand. These are certainly inexpensive remedies, and they are reported to be very effective. This little circular of eight pages will be forwarded by the Department to any nurseryman or fruit-grower on application.

It is now possible to add a few facts relating to the lamented Maximowicz to the short note which appeared a few weeks ago in these columns at the time of his death. The information is gathered principally from a notice published in *Nature* on the 12th of March, from the pen of Dr. Otto Stapf. Maximowicz was born at Jula in 1827, and was educated in St. Petersburg. At the age of seventeen he entered the University of Dorpat, where, after completing his studies, he was appointed assistant to the director of the botanical gardens, a post which he continued to fill until 1852, when he was made conservator of the Botanic Garden at St. Petersburg. A year later he started on a voyage round the world on the frigate Diana, being entrusted with the duty of gathering living plants for the St. Petersburg garden. On this journey he visited Rio, Valparaiso and the Hawaiian Islands. The Crimean war compelled the Diana to seek a Russian port, and the nearest was De Castris on the coast of Manchuria. Maximowicz was obliged to leave the ship, and decided to explore the basin of the Amour and the adjacent region, then little known. This task he carried out under great difficulties and with severe privations, and returned to St. Petersburg through Siberia in 1857. He traveled in Manchuria again in 1859 and 1860, visited Jesso in 1861, Nepon in 1862, Kiu-siu in 1863, and returned to Europe by sea in 1864. In 1869 he was appointed Botanicus Primarius of the Imperial Botanic Garden at St. Petersburg, and was entrusted with the care of the herbarium of the Academy. Those who had the advantage of Maximowicz's acquaintance and friendship will feel, with Dr. Stapf, "that he was a noble, high-minded nature, a highly cultivated scholar in almost every branch of learning, and a gentleman in the truest sense of the word."

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A National Reservation at the Head-waters of the Mississippi.

In the eighteenth annual report of Professor N. H. Winchell, State Geologist of Minnesota, it is suggested that a state park should be established, and the location especially favored is the region about the Itascan source of the Mississippi River. Here are the prime attractions of many lakes, rivers and streams of pure water which are found where the tumuli of the glacial epoch formed depressions and reservoirs such as mark its moraines. Besides this, it has much historic interest as a region of adventure since the days of Lieutenant Allen, of Schoolcraft and of Jean Nicollet.

This recommendation of a great forest-reserve, which might include the head-waters of the Mississippi, the St. Lawrence and the Red River of the North, has more than a mere local importance. In the first place, a dense forest on the north-western highlands of Minnesota, or, as it is known, the Height-of-Land region, which constitutes the divide between the Red River and the Mississippi, would be of great value in preserving the water-supply of these great rivers. The land here consists of rolling, gravelly drift-hills, with many small lakes which have neither inlet nor outlet, while at a lower level there are springs and lakes, with under-ground supply, which constitute the remotest sources of the three great drainage-systems of the continent. No doubt, if all these lakes and streams and reservoirs could be protected from sun and wind by dense coniferous forests, which would also protect the ground from deep freezing and the snow from melting rapidly, this would help to make a more uniform distribution of water. It is well known that, in the woods, ground which was frozen in the fall will thaw out under deep snow, and the snow will gradually settle, thawing underneath, though the temperature above it may be below freezing. While these conditions prevail in the deep woods, on the prairie, but a few miles away, where the winds have full sweep, and the ground is blown bare, the frost is often from five to fifteen feet deep, and may remain in the ground until June or July. Meanwhile, the melted snows with the spring rains have run off from the surface, instead of settling into the soil. The great floods in the Red River valley, which is practically treeless except near the heads of its eastern tributaries, follow cold winters with deep snow, and occur in April and May as the snow melts.

For the purpose, therefore, of protecting our water-supply there are few regions in the United States where a forest-reservation could serve a better purpose. It should be remembered, too, that fires started by Indians and settlers run over this drift-region, through the forests of Norway Pine, Jack Pine and Poplar in front of the lumbermen. It is probable that, west of the Mississippi, as much log-timber has been destroyed by fire during the past thirty years as has been cut. If a reservation could be held here, while some of this timber remains, an experiment in systematic forestry might be made, with a reasonable chance of proving that it could be conducted with profit. If this is delayed for a few years, instead of having timber and young growth to start with, nothing will be left but worthless barrens throughout all this elevated region, and, indeed, these barrens cover a considerable portion of it already.

This proposed reservation, which should include Itasca Lake and the tributaries above its outlet, is a basin of unusual beauty, abounding in mineral springs as well as in typical moraines, drift-hills and lakelets. It is from 1,200 to 2,000 feet above the sea-level, and is, substantially, a non-agricultural region, although not too cold for farming. The hills are covered with the growth of the trees named above, where they have not been destroyed by fire, and there are forests of Tamarack, Spruce and Fir in the low-land. It is mostly unsettled yet, but it may be impossible in Minnesota to secure an unbroken reserve that would cover all the land which should be held in timber, for, scattered among the forests, there is land here and there which could be profitably tilled. But there is little doubt that it would be wise to withhold all the timber-land and brush-land of the state from settlement until it should be examined and the question of its adaptability settled. The present practice is to enter the land, strip it of its timber, and then, if it is not good agricultural land, to abandon it to annual fires. In this way millions of acres are made non-productive. There are at least 9,000,000 acres in northern Minnesota, at a rough estimate, which could be always more profitably kept in wood-land than in farm-land, while the entire 30,000 or more square miles which are in timber and brush should be protected from fire and held for producing timber until it was actually entered for farm-cultivation.

The senate of Minnesota has already passed a series of resolutions, which were prepared at the suggestion of the Minnesota State Forestry Association, petitioning President Harrison to set apart a vast tract of unoccupied and non-arable lands which lie contiguous to the Lake of the Woods, to Rainy Lake and to Rainy River, for a great national park. There are 3,000,000 acres in a compact body in that section, and the Forestry Association urges that at least one-third of this be reserved. Recent law, as we have explained, empowers the President to set apart such reservations. No doubt, the friends of forestry in various parts of the country will be prompt to point out places where it may be wise to exercise this power. It seems to us that this high region of Minnesota is one which is certainly worthy of attention for this purpose.

The Boston papers announce that the Forester of that city is prepared to give shade trees to citizens who will agree to set them on the streets before their property, the recipients to supply at their own expense the labor and soil necessary to plant the trees. Theoretically, this sounds attractive; practically, if the offer is accepted by many people, the appearance of the city will be seriously injured, and the taste of the inhabitants for trees and tree-

planting will be checked rather than developed. It is a difficult matter to make trees thrive in cities; they must be carefully selected for the purpose, and special attention must be given to planting them if they are to struggle successfully against the hardships of a city life. Uniformity is essential in a street plantation, and uniformity can only be obtained by planting in one street trees of one kind, and by planting them all in the same way—that is, with the same amount of soil about their roots and equal chances for obtaining moisture. If each of a dozen men, living in the same street, should exercise his individual taste in selecting the tree to be planted before his door—one planting an Ash, another an Elm, another a Maple, the next a Spruce, a Pine, a Catalpa or a Sycamore—and if the trees are furnished with soil according to the intelligence or liberality of the individual planter, it will not require any very great expenditure of imaginative force to picture to the mind what this row of trees will look like at the end of ten years. A line of lamp-posts, each selected according to the fancy of the citizen in front of whose house it was placed, would be less grotesque and objectionable.

The decoration of city streets with trees is a proper and excellent thing; its importance is recognized in most of the great cities of the world, and in some of them it has been carried out in an admirable manner. It is a part of street construction, however, just as much as paving or the setting of curb-stones, and unless it can be done well under an intelligently studied system by the municipal authorities themselves, it had much better not be done at all. If the citizens of Boston feel any doubts with regard to the advantage of good street-planting over bad street-planting, they have only to compare their delightful Beacon Street mall with the older plantations at the eastern end of Commonwealth Avenue.

The Gardens at Monte Carlo.

MANY are the sins that have been committed in the laying out and building of American towns, but the greatest of all, perhaps, has been the neglect or defacement of their water-fronts. Whether the adjacent water is ocean or great river, lake or little stream, we seldom see its shores turned to the best advantage, and often they present a more deplorable aspect than any other part of the town. In New York tumble-down, malodorous, muddy wharfs, flanked by streets which are frequently pools of water, line a shore that ought to be encircled by well-built, well-kept piers, and even the precious little expanse of Battery Park is daily threatened with curtailment; in Boston the back yards of Beacon Street houses lie along the wide estuary where a stately, tree-bordered esplanade should have stretched; and the river or brook which intersects a country town is most often edged by rickety sheds or fringed with ragged weeds, and is spanned by bridges as perishable as they are ugly. Of late years public attention has, indeed, been directed to the subject of water-fronts, and much has been done to secure them, in the outskirts of great cities, against the disfigurement that has overtaken them in portions already built. The parks at Chicago have been laid out with a wise sense of the value of the lake-frontage. Boston has claimed for similar purposes certain stretches of the Back Bay Shore, and New York has constructed Riverside Drive and bought the water-front near Pelham. But there is need that more should be done in this direction and that we should learn from older countries the art of beautifying the water-fronts we are beginning at least to reserve. All foreign countries are full of examples of this art, whether it has been employed merely to dignify reaches of shore that must be put to commercial use or to create ornamental promenades and gardens. The quays at Antwerp are as good in their more prosaic way as the Thames Embankment in London. The Elbe at Dresden is not defaced by the structures that line its banks, though they are not all terraced promenades, but include steamboat-landings, private grounds, hotels and restaurants. At Rouen the chief hotels look out on a river crowded with shipping, yet look on a scene devoid of squalor or architectural meanness. At Lyons the great stream rushes between close-pressed ranks of tall buildings, yet a fine drive runs by it in many places, and everywhere the shore is agreeable to look upon. At Prague there is a truly magnificent series of wide esplanades upon which some of the finest buildings in the city have been placed, and a succession of bridges where the newest wrought-iron span does not seem out of artistic keeping with the famous great stone bridge which, until some of its arches were swept away last summer, had stood intact since medieval times. And so one might pass from land to land and town to town, only to find that everywhere the water-front is valued and everywhere is intelligently treated, with parks or avenues if possible, and if not, at least with respectable buildings and cleanly shores.

The picture we give on p. 200 shows a peculiarly charming treatment of a water-front. As possessing the only public gaming-house still open in Europe, Monaco would in any case attract a multitude of visitors. But its development would never have been so great, and it would never have drawn thousands of tourists who do not come for the sake of gaming, had its situation not been so marvelously beautiful. The town itself, and the promontory of Monte Carlo where the Casino stands, overlook from their rocky heights the vast blue expanse of the Mediterranean, and the gift of nature has been sedulously enhanced by the intelligence of man. The drives along the cliff-edge are admirably planned, and, like the Casino gardens, show what may be achieved when architecture and horticulture are combined by an artistic hand. Monsieur Edouard André, the famous French landscape-gardener, never did a better piece of work than here, and the effect of his planting has been increased by the skill of gardeners who have caused Palms and other exotic plants to grow with extraordinary luxuriance. The treatment is somewhat formal, as befits the neighborhood of stately buildings and the presence of perpetual crowds of visitors. But there is no monotonous regularity in the arrangement either of the terraces and balustrades or of the sub-tropical plants which give such a singular charm to the spot in the eyes of travelers fresh from the wintry north. We can imagine what such a shore would be were this an American watering-place. It would doubtless not be given up to utter neglect and dishevelment, but a wooden paling would probably replace the marble balustrade, board walks the gravel slopes and marble steps, badly chosen trees in inharmonious variety the orderly avenue, and a stretch of Coleus-beds the beautifully grouped shrubbery. Of course, the exact treatment appropriate at Monaco would not be appropriate in a northern American watering-place; but something of the same orderliness, dignity and beauty ought to be secured far more often than it is. And while, in American country places, picturesqueness, rather than symmetrical stateliness, is usually appropriate, there are cases where it would be best to try for the more formal architectural charm which distinguishes the Casino gardens at Monte Carlo.

How We Renewed an Old Place.

IV.—CLEARING UP.

THE forlornness of an old, neglected farm is largely owing to the condition of its trees and shrubs, which, being left to themselves, take on a tumble-down, half-dead look that often belies their real condition. A few decayed trees bring all the others into disrepute, like a grog-shop in an otherwise respectable neighborhood, and untrimmed shrubs are as unbecoming as unkempt hair.

When we came to examine matters at Overlea, as we named our acquisition from its command of the meadow, we found that a good sweeping and dusting would do wonders for it, and with that enthusiasm for setting to rights inborn in the New England breast, we prepared for a grand redding up.

While the grading of the knoll was going on preparatory to building the house, our factotum, appropriately named Blossom, since his function was to adorn the place, was busily employed in removing all the unsightly dead limbs from among the live ones, and in hewing down such old Pear and Apple-trunks as proved hopeless.

The logs and branches were dragged away to the wettest place in the meadow at the back of the knoll, and transformed into a corduroy road, by which one could pass dry-shod out into the rear street. This floating rubbish, supported by the tangled grass on the marsh, formed a foundation upon which, after inserting a plank water-way at the bottom, for the ebb and flow of the tide, we subsequently built a substantial carriage-road of stones and gravel, which now affords a back entrance to the stable and kitchens.

The palings of the fence were removed for kindlings, but the posts and rails were left to form a slight boundary until the hedges and tree-rows should be fairly established; the straggling shrubs were trimmed into better shape, the Box-arbor clipped and cleared of weeds, trailing vines were taught

once more the use of a trellis, and the grass was mown and raked clean of the last year's rowan.

Fierce war was made upon the Burdocks and Mint and Horse-radish that had squatted everywhere on the land; load after load of the accumulated rubbish of years was buried under the corduroy road, and hidden from view with gravel; the Pear-trees we carefully pruned and tied up, and the old Grape-trellis stiffened with new posts and lattices.

When all this was done, and it was no brief job, the place took on a civilized air truly surprising, but, like the boy's washing his face, which cost his father a thousand dollars, the felling of the first ragged old tree was an entering wedge of improvements that find no end.

The clearing up revealed unsuspected beauties and possibilities in the old place, and at the end of it we had taken an account of stock, and were aware that we had become owners of a treasure-house of enjoyments. But the charms and wealth of that old garden are "another story" which remains to be told later.

While all this spring and fall cleaning was going on, the heavy labor of grading was in progress. Teams and men were coming and going, heavy scrapers were plowing part of the little knoll down into the valley, and loads of gravel were being dumped to bring the slopes into proper form, the surface soil having been first removed to cover the future lawn. Week by week the work went on, till the very landscape changed its contours, as the removal of the crown of the knoll threw open to view, from the sidewalk, the fine sketch of green meadow and blue stream, once hidden from view by its cone.

When our much-interested critics found that we had chosen the site for our dwelling in an unexpected part of the grounds, their murmurs again reached our ears.

"Why in the world don't the doctor build up on top of the hill, where he can see everything, and be among neighbors?" sang half the chorus.

"If I had a lot of big trees like those Elms I'd get the good of 'em, and put my new house on the old cellar," echoed the antiphonal.

"Never can make anything better 'n a Shumack-bush grow in that gravel-pit," shouted they all together.

"Well, perhaps he knows what he's about," would interpose some friendly voice; "but it wouldn't be my way, anyhow. He'll find out, come to plantin', that he's got to have soil, even for a door-yard."

When it came to building the foundations, their distance from the highway seemed inordinate to most of these critics, but now and then we were reproached by the more ambitious for not leaving front enough. In fine, we came to be in full sympathy with the Old Man and His Ass of the fable; but being luckier than he in having a mind of our own, we did not end by pitching house and all into the water, as we might have been tempted to do from the multitude of counselors, in which, in spite of Solomon, there is not always wisdom.

Our firm conviction was that the hill, in spite of the commanding view toward the north, was too bleak and exposed a position to be pleasant for an all-the-year-round home; it was also too near the neighbors' lines, and too remote from orchard and garden.

On the other hand, tempting as the great Elms certainly were on a hot summer day, the lot at that end of the farm was quite too narrow for a house and stable such as we required. The knoll, though limited in area, gave us plenty of elbow-room, and from its elevation we overlooked the grassy swale on one side, with the hill for a background, and northward could view the ever-changing tints of the meadow, behind the gardens and the fruit-trees. Experience has confirmed the wisdom of our choice, and, in justice to our advisers, I will say that they now handsomely admit that, though they "didn't think much of the doctor's ch'ice, to begin with," they are now convinced that "he has got about the likeliest lot on the street."

Since publishing the first of these papers I have received various inquiries with regard to some of our experiments, which, perhaps, it would be well to begin to answer here, before going farther. One of the questions, which concerns the Willows, asks whether we are to make a hedge of them or allow them to grow up into trees. "If you allow the Willow-trees to grow up," asks my correspondent, "won't they shut off all your views; and if you don't allow them to, won't the labor and trouble of cutting them back every year be serious?"

In reply to this I would say that we do mean to let them grow into trees at their own sweet will, at least for the present. The knoll is so high, and the slope of the ground, from the foot of it to the edge of the place, so decided, that our veranda-floor is some twenty-five feet above the level where the Willows are set, so that they can grow for some years to come without becoming an annoyance. They are also quite a long distance away, as the line runs diagonally between us and the meadow. Should they ever become a serious obstruction, polling once in five years, we think, will keep them where we want them, as from our elevation we can look directly over the top of a very tall old Apple-tree which stands at the foot of the slope near the house, and a Willow in the distance will have to be quite a tree to be really troublesome. A vista cut here and there in the line will really enhance the charm of the prospect, but at present they are not more than fifteen feet high.

Another inquiry comes with regard to the preparation of the soil on the hill for the Pines.

Unfortunately, we did nothing in the way of making a bed for them beyond the process I have described. No doubt, they would have fared much better for a little feeding and more of them would have lived, but the hill was very steep and hard to get at, even with a wheelbarrow; and, besides, we had no soil to spare, for we needed everything we could get for the lawn and did not care to buy any for so doubtful an enterprise. We, therefore, tried our experiment under the sternest conditions. However, those tiny Pilgrim Fathers of the future forest stood the trial like little men. Some of them, it is true, died of consumption, and some of fever; but the survivors are growing tall and stout on their poor pickings and will do us credit yet.

There is one of them, nicknamed Episcopus, from its birthplace in the church lot, which is a beautiful illustration of that fable called Nature and Education, in "Evenings at Home," a book which was the delight of the childhood of a previous generation and an infinite bore to the present advanced infant.

I spied the poor thing one day hanging by one root to the side of a sand-hill, which was being graded to a smooth slope, and asked the men who were working there to let me have it. Though much ridiculed for its shapeless and unpromising aspect, it was given a comfortable shelf pretty well down on the slope and coaxed to hold its head up by various devices. Unused to kind treatment, this wayside waif, which had got used to growing nearly upside down, hung its head and sidled up against the hill, and seemed to find its branches as much in its way as the legs and arms of a guttersnipe in a parlor; but time and training and the neighborhood of Boston have their influence even on a Pine, and that clerical tree is now a very Bishop in erectness and dignity, having been lopped and pruned and tied to stakes till it puts the most symmetrical of the other Pines to shame by the vigor of its development, proving that if anything can "beat Nature" it is Education.

The consolation of a limited number of trees is that each one acquires an individuality, and their owner gets to know them as a shepherd does his flock. I wish every one could learn the way in which these little growing things take hold of one's interest, and people life in the country.

The forester of ever so minute a wood has a fund of enjoyment on his plantation that no unlimited order to the best of landscape-gardeners can ever give him. It is a fine spiritual exercise to bring the mind into sympathy with inferior organisms, and when one has fairly learned to love anything so stubborn and irresponsive as a tree, he has gained a step in mental development, even beyond that point won by a sympathetic understanding of his brother man.

However fond one may be of a flower-garden, I doubt if it ever yields quite so sturdy a satisfaction as the culture of trees. It is the difference between bringing up a girl and a boy—one all light, color, sweetness, a thing to be cherished and tenderly sheltered and nurtured; the other less outwardly winning, more obstinate in development, more independent and manly in habit, but more worth while; of positive pecuniary value when well grown; and formed, when symmetry and breadth are fully attained, to be of service in sheltering the weak and weary who seek protection in what Mrs. Gamp would call "this wale."

Hingham, Mass. *M. C. Robbins.*

Winter Studies of the Pine Barren Flora of Lake Michigan.—II.

IN some of the sphagnous bogs, or in the shallow water of sloughs on which the Peat Mosses encroach, we shall come on another shrub of the Heath family, *Cassandra calyculata*. Wherever found it grows in the greatest profusion. It is not quite an evergreen, but its oblong leaves are very persistent, and of a thick texture, giving it its common name, Leather-leaf. They fade to a yellowish or straw-colored hue in the winter, though some are purple or purple-tinged. The numerous ascending leaves are closely appressed to the stem at this season. This exposes their scurfy lower surfaces, cov-

ered with brown scales, an interesting feature of epidermal structure when examined by a magnifier, and a pretty object for an opaque mount. The stems of the Leather-leaf are about two feet high, and end in slender tips clothed with small leaves. These bear the flowers in the early spring, for it is one of the earliest to bloom. They are also peculiar in bending away from the axial line of the stem with a moderate curve, giving a graceful turn to the extremity. The Cranberry nearly always accompanies the Leather-leaf, but is not so restricted in range or habitat. It is seen in other localities, sometimes in the wet sands, where it seems to do well, showing a natural basis for the different conditions to which it has been subjected in cultivation. The species is *Vaccinium macrocarpon*, and the berries of all the vines I have seen here are spherical. They are scarce in winter, having been picked for market, or more often for domestic use, since the areas covered are too small to make their gathering of much profit. But when seen, there are few handsomer fruits than these large red or flesh-colored berries hanging from a slender stem, and made prominent by the pale sphagnous Moss among which the delicate vines creep. They are darker-colored in the winter, and the frost takes away some of their acidity. The small glossy leaves are changed to a light purple, and, as in Cassandra, are frequently turned so as to expose their lower surface, in this case smooth and glaucous.

There are other humble evergreens, almost herbaceous in character, but with leaves capable of enduring the cold of winter. They are mostly *Ericaceæ*, and are visible when the ground is bare. One of these is the Prince's Pine (*Chimaphila umbellata*). Its thick and glossy leaves, clustered on the short stems so as to form a kind of rosette, are as green and shining as in the summer. Very rarely I have found the other member of the genus, *C. maculata*, in the shade of Pines and Cedars. Its leaves, mottled with white blotches, do not shine like those of the other kind, but furnish it with one of its chief characteristics. The Checkerberry, or, as it is better known with us, the Wintergreen (*Gaultheria procumbens*), is abundant in suitable locations, generally in the shade or where the sand is damp. The leaves on some of the stems are green and glossy, but on many they have changed to a dark or vinous purple, so that a patch of these plants is quite variegated, but not as much so as in the case of the Bearberry. They are often furnished with scarlet berries, only partially hidden by the leaves, which adds to their variety and gives them prominence for fruit as well as leaves. This remains upon the plants till spring, and is frequently gathered for market, rather for its bright color and pleasant, spicy taste and aromatic flavor than as an article of food. Similar to the Wintergreen as to its scarlet berries, but quite different otherwise, is the Partridge-berry (*Mitchella repens*). This small trailing or prostrate vine, but a few inches long, is rare in the Pine-woods, growing sparingly on the richer shaded knolls, or creeping beneath the evergreens, where the soil is most productive. I find it oftener in this vicinity in the hard-wood forests, with a soil of clay or loam, in which it commonly takes the drier knolls as a place of growth. The leaves are green and shining, small, roundish and opposite. Its curious double drupes, of a sweet and pleasant taste, stay upon the vines a long time if they escape the notice of birds, and when in flower in June the fruit of the preceding year may be obtained.

Several kinds of Pyrola will be found when the ground is free from snow. As in Chimaphila the leaves are clustered near the ground, from the midst of which they send up a flower-stem in summer. The leaves are mostly oval or roundish, and often large for the size of the plant. *P. rotundifolia* has shining, coriaceous leaves, round or broadly oval; *P. elliptica* thinner and more delicate leaves, more elliptical in outline. But the two species are very closely allied, and appear to run together in their leaf-characteristics, both as to shape and texture, so that it is sometimes difficult to identify the species, the specific names not being diagnostic in this respect. Both species are common. *P. chlorantha* is much rarer, its small round leaves, rather thick and dull, so well characterizing it as to make it easy to determine in the winter-time. So of *P. secunda*, well marked by its thin, ovate, finely serrate leaves, more scattered on the low stems, and but little shining. Though met with more frequently than the last, it is somewhat rare. Both of these are more delicate plants, and with smaller leaves, than the two first mentioned. The conditions of growth of all are essentially alike, though *P. secunda* may affect drier situations, and *P. rotundifolia* those more damp than are habitual to the rest.

Another small plant with very bright fruit is seen now and then, the Dwarf Cornel, or Bunchberry (*Cornus Canadensis*). Its compact bunch of red berries, at the top of the low stems, is very prominent, and, since there are no leaves to hide it, the ground is fairly red where they grow in beds. It falls an easy prey to birds, which are very fond of the sweet and palatable berries. One more pretty evergreen vine sometimes delights the eye when a spot thickly covered with the slender, trailing stems of *Linnæa borealis*, the Twin-flower, is found. It grows in the dense shade of evergreens, and the tangled and matted stems, with small, roundish leaves, almost carpet the ground, and afford the botanist in themselves and their associations one of his choicest plants. This and the Dwarf Cornel, together with the stemless Lady's-slipper (*Cypripedium acaule*), when all are found in the cool, damp woods in blossom about the same time in early summer, bring to mind more vividly than any other plants in the barrens scenes from woods farther north. The places where they grow with the surrounding Cedars and Pines seem like spots taken from the foot of Lake Michigan and transferred to its head.

Englewood, Ill. *E. J. Hill.*

New or Little Known Plants.

Aster Tartaricus.

THERE is more pleasure to be had in the open air in North America in the autumn than at any other season of the year. It is the time of all others here to enjoy the garden and the woods, and we should lose no opportunity to increase the number of plants which are at their best at that season, and which can be successfully grown in our climate. There are many plants which are more beautiful in the autumn than at other times on account of the colors their leaves assume toward the end of the year, but there are not a great many which bloom in the autumn in comparison with the number which expand their flowers in spring or in early summer. Thanks, however, to Asters and Golden-rods the list is a fairly long one, and the flowers with which these plants enliven the autumn landscape are not without variety of form and of color.

It is desirable that they should be better known and their value for the garden appreciated more fully than it is now, in this country at least; and with this end in view we have already published figures of some of the handsomest and most distinct American species. The illustration in the present issue (p. 197) represents the end of a branch of one of the few Old World Asters known in gardens. It is an Asiatic species, and excels all the American Asters in the height to which it grows, in robustness and in the great size of the lower leaves, sometimes more than two feet long, and like the leaves of some great Silphium or Inula. The leafy stems, which are not developed until the end of summer or the beginning of autumn, shoot up rapidly sometimes, if the plant is well fed, to a height of six or seven feet, and then branching produce at the ends of the branches, which form immense, long, rather loose panicles, large, bright-colored, blue or purplish blue flowers. These do not open until the end of October or early November, or not until the flowers of all but two or three of our American Asters have passed; and if the season is favorable they continue to open until almost the end of November. A sheltered position must be selected, however, if flowers from the open ground are expected anywhere in the north after the middle of November, except in years when the coming of winter is exceptionally delayed.

Aster Tartaricus is blessed with a good constitution and a rapacious appetite; and it needs strong feeding and a deep soil into which to send down its long, stout roots; and, like most perennial plants, it gives the best results when the great clumps it soon spreads into are occasionally lifted, divided and reset in fresh soil. Treated in this way, this really noble plant will not fail to do justice to itself and to delight the owner of the garden who is fortunate to possess it, and his friends.

Aster Tartaricus is one of the best hardy herbaceous plants for supplying cut flowers for large decorations at the time of the year cut flowers are most difficult to obtain.

Foreign Correspondence.

London Letter.

Iris Robinsoniana.—The flowering of this plant at Kew is an event of considerable interest to English horticulturists, to whom its exceptional size and beauty were long since made known by botanists, but its flowers have never before been produced in England. It is larger in leaf and inflorescence than any other known Iris, the plant at Kew being seven feet high and six feet through, the leaves eight feet long by four inches in width, gracefully curved near the top and of a healthy glaucous green; they remain fresh on the plant several years. This specimen is growing in a sunny, airy position in the house where Agaves, Aloes, Dasylirions, etc., are grown, and it is planted on a raised mound which is kept fairly saturated by drip from a water-tap close by. It is about six years old.

The flower-spike is from five to six feet high, branched above and producing from 120 to 200 blooms which expand in slow succession, remaining open only a few hours. This species is a native of Lord Howe's Island, where it was found by Mr. Charles Moore, Director of the Botanic Gardens at Sydney, when on a visit to that island in 1869. In his report he stated: "A large Iridaceous plant, called the Wedding Flower, was found sparingly in two or three situations. Of this seed vessels only were obtained, but the flowers are described as very beautiful. . . . In appearance it resembles a large Morœa, but will probably prove a new genus." Bentham described it under the name of *Morœa Robinsoniana* in the "Flora of Australia." The expanded flower is about four inches across, pure white, except at the base of the larger segments, where there are some lines of golden yellow.

It is remarkable that a solitary species of Iris should occur in a small island off the east coast of Australia, thousands of

Fig. 35.—Aster Tartaricus.—See page 196.

miles away from any other member of the genus; for there is no species of Iris in the Australian continent, nor anywhere nearer than China. The South African *I. bicolor* (Dietes) and the North African *I. stylosa* are the most nearly related to this giant from Lord Howe's Island.

The Kew specimen is as ornamental without the flowers as the New Zealand Flax, *Phormium tenax*, and in countries where severe frost is not experienced the Iris would, no doubt, prove equally serviceable as a specimen for lawns, etc., as the Phormium is here.

According to an account of this Iris, published in the *Gardeners' Chronicle* in 1872, by Dr. Bennett, it appears to have first flowered under cultivation in the Sydney Botanic Gardens in 1871. It also bloomed in the hill gardens at Hakgala in Ceylon in 1885, and in the gardens of Mr. Dorien Smith, at Tresco Abbey, Scilly, in 1886.

Phajus Cooksoni ×.—The stock of this beautiful hybrid has been secured by the Messrs. Sander & Co., of St. Albans, where some of the plants are now finely in flower, some of the spikes being over two feet in height, and as stout both in stalk and flower as *P. Wallichii*. Evidently, Mr. Cookson's latest fine production is a first-rate garden Orchid, as it has consistently grown and flowered from the first as freely as one need wish, in this respect partaking largely of the nature of *P. Wallichii*. Of the other parent, namely, *P. tuberculosus*, the hybrid appears to have inherited only a large share of its beauty without any of its "miffiness." As Mr. Sander says, we need no longer bother about *P. tuberculosus* now we possess *P. Cooksoni*. Unluckily, however, the "we" in this case is only Messrs. Sander & Co.

Dendrobium Venus ×.—This beautiful hybrid was raised by Mr. N. Cookson from *D. nobile* and *D. Falconeri*, and flowered for the first time in May, last year. It is now again in flower at St. Albans. The habit of the plant is intermediate between the two parents, and it appears to be as free in growth as *D. nobile*. The flowers are as large as the largest *D. Falconeri*, and similar in color, but minus the yellow disc of the lip. Altogether, *D. Venus* is a distinct gain, and is certain to take a foremost place among the best hybrid Orchids of artificial origin. Mr. Cookson, evidently, does not waste his time and skill in operating upon Orchids that cannot produce anything worth having. He has raised two of the finest hybrids yet seen, namely, *Phajus Cooksoni* and this Dendrobium, besides many other beautiful things.

High-priced Orchids.—A portion of the collection of Orchids formed by Mr. Pollett, the well-known horticultural printer, was disposed of by auction in London this week, and some of the plants realized exceptionally high prices. Among them were *Odontoglossum crispum*, var. *Leopardinum*, a small and not very healthy plant, which sold for 100 guineas; *O. crispum*, var. *lilacinum*, fetched eighty guineas; *O. elegans*, thirty-eight guineas; *O. excellens*, thirty-six guineas, and *O. Hallii*, var. *magnificum*, thirty-four guineas. Several other varieties of *O. crispum* sold well; for instance, one called Bonnyanum, for nineteen guineas, Bickleyense for sixteen guineas, Pollettianum thirty-seven guineas. *Cypripedium Morganiæ* realized thirty guineas, *C. Schroederæ* seventeen guineas, *C. leucorrhodum* eighteen guineas, and so on. The unusual success of this sale is attributed largely to the colored illustrations of the best Odontoglossums printed and circulated along with the sale catalogue. Of course, Mr. Pollett's excellent judgment as an Orchid connoisseur, which led to his collecting only what is best among Orchids, gave buyers confidence. Scarcely any of the plants were what would be termed large specimens.

As a set-off against the high prices paid for choice cool Orchids I may mention the miserable prices realized by a large sale of East Indian Orchids from the collection of the Duke of Marlborough at Blenheim, which were disposed of by Messrs. Protheroe & Morris a few days ago. Big specimen Vandas, Ærides, Saccolabiums, Angræcums, Cypripediums and other tropical Orchids were sold for less than the pots containing them had cost, and they were good healthy plants, too. A democratic acquaintance remarked that buyers were justly boycotting a nobleman who had entered into competition with the struggling dealer, an allusion to the well-known trading character of the Blenheim collection.

Hippeastrums.—The collection of these plants in the Chelsea nurseries of Messrs. J. Veitch & Sons is now one of the great horticultural attractions in London. A large span-roofed house is entirely filled with the plants, and they now carry over three thousand scapes of flowers. The effect of these when expanded is magnificent. Every year brings new and improved varieties, the successes of last year being eclipsed by the successes of this. New crosses are made, seeds sown, and the bulbs grown on year after year, so that the thousands of plants sold are replaced by a successional lot, and there is never a gap. The brilliant results obtained in this field by Messrs. Veitch place them a long way ahead of all other breeders and growers of Hippeastrums. I have heard it whispered that the profits of Hippeastrum culture have proved exceptionally satisfactory at Chelsea. Apart from their commercial value, these plants, when well managed—and, according to Messrs. Veitch, few bulbs give less trouble—are almost without a rival among in-door bulbous plants. I am told that enterprising planters in the West Indies are buying some of the best of these plants for extensive cultivation under the favorable conditions afforded in some of those islands, with a view to supplying the European and American markets with Hippeastrums by the thousand.

London. *W. Watson.*

Cultural Department.

The Reticulated or Sponge-bearing Cucumber.

UNDER the name of "Luffa," or "Cucumber Sponge," we now import in compressed bales, from Japan and Egypt, the reticulated skeletons of two varieties of what Ebn Baitar, the Arabian botanist, twelve hundred years ago described as the "Luffah," taking his title from the Egyptian name of "Luff." Dr. John Veslingius, of Holland, in 1638, in writing a work upon the plants of Egypt, as a sequel to that of Prospero Alpini, describes, with two engravings, the Cucumber-plant that now furnishes the commercial Luffa of Egypt, under the title of *Luffa Arabum*, or *Cucumis reticulatus Ægyptius*. The Japanese and Egyptian commercial varieties so closely resemble each other that the pictures of Veslingius, which were taken from plants grown by himself, are excellent representations of the Japanese *Luffa macrocarpa*. Had he cultivated the Japanese variety, which comes to maturity much earlier, he would not have fallen into the error of describing the seeds as white instead of black. From a very early period the reticulated skeletons of *Luffa Arabum* were used by the Egyptians in their bath-rooms, and it is probable that the Japanese did the same with that of the *L. macrocarpa*.

Sponge-bearing Cucumbers may be found in a large number of hot countries, and vary in size from that of a plum to three feet in length. In some the skeleton is very thick and strong, and capable of being made of use in the household, but in the majority the netting is thin and delicate, and can only be regarded as a curiosity. Like ordinary Cucumbers, some are edible, and are grown for the table, while others are more or less medicinal, and are used as domestic remedies. As the reticulation forms at a late period, the Luffa, when of an edible sort, can readily be cooked as a vegetable when young; the rank odor of the fruit would be an objection to its use with us, but this has not availed much against the tomato.

But little attention has been paid by botanists, either ancient or modern, toward collecting, arranging and describing the class of cucumbers which is distinguished by bearing a subcutaneous or a complete internal skeleton. Under the name of Momordica, Cucumis, Pepo and Luffa we may find several varieties described in old botanical works, chiefly in Latin, Dutch and French; and may also discover that several, as the *Luffa Petola*, *L. acutangula*, *L. Ægyptica*, etc., have been very correctly represented by large plates.

The Luffa is fully entitled to membership in the Cucumber family, and is in no sense a Gourd, as it has sometimes been called. It is monœcious, having separate staminate and pistillate flowers, of which the former are much the larger, or more conspicuous; and the leaves much more closely resemble in form those of our common cucumber than do many in Egypt, Palestine and India, upon plants producing the best table varieties, some of which are much more like Cantaloupe-vines than Cucumbers, as we know them.

My first trial in growing Luffa-seeds was a failure, because I made the attempt with a variety that required so long a season in which to perfect its net-work, that frost came, even before it had begun to form. The fruits grew half a yard in length, and the vine was vigorous, but the season required was too long for this latitude. My second venture was with the *L. macrocarpa* of Japan, which produced fully matured fruits in five months from the day of planting. This is the best sort to grow in a temperate climate, and bears the most symmetrical of all the sponge cucumbers; the fibre of the netting is coarser than that found in the Egyptian variety, and not so well adapted for use as a scrubber in bathing. *L. macrocarpa* bears cucumbers from thirteen to fifteen inches long, and some of them are very nearly straight. The vine is a vigorous

grower, and, in favorable seasons, bears a fair crop of cucumbers. In very dry weather there will be a scarcity of pistillate flowers until after a supply of rain, when they will appear in almost every joint. The cucumbers develop rapidly, and, but for the slow growth of the vine in the early season, would come to maturity in large proportion ; as it is, however, there will be many fruits that will only be partly grown when frost arrests their development. Much time may be saved by having the plants grown a yard or two in height in a greenhouse, and then setting them out on the 10th of June ; as the plant is tropical, it will stand the full heat of the sun all day without drooping, and grow all the better for it. My best success came from planting against a trellis on the south side of a wooden building, with an all-day exposure to the sun.

Next to *L. macrocarpa*, the wild Cuban does the best in Philadelphia, as it comes to maturity early, and grows much larger than in its native island. The Egyptian variety grows well and sets many fruits; but these are late in maturing, so that as yet I have not produced any with black seeds. The Petola I have not tested yet ; it looks promising in its picture, and is one of the few that produce a good reticulation. A hybrid between the Japanese and Egyptian varieties might readily be produced with a brush, and, theoretically, should be finer than the Japanese in its netting, and shorter-seasoned than the Egyptian. Hybridization should be produced each way between the two parents, and plantings tested with seeds from several experiments, as this way of producing new varieties has much uncertainty in its final results.

The first Luffa sponges sold in this city were grown from Cuban seed ; the second came from Japan, and the third from Cairo, in Egypt. Japanese seed were grown in Louisiana before there were any sponges of *L. macrocarpa* for sale here, and my first stock came from that state. Under the name of the Bonnet Gourd and Dishcloth Gourd, this and the Cuban Luffa are now well known in several of the southern states, although, as I have stated, the name of Gourd is a misnomer. Bonnets are sometimes made from the opened sponges, shaped out with some woven fabric, but the entire head-covering was not produced of the net-work until the large white Luffas of Egypt furnished the material for cutting and fitting.

The *Cucumis reticulatus* of Egypt is grown in large quantities, and has become quite an article of commerce, being exported mainly to England and Germany, the packages containing 1,000 to 1,500 each ; but a small proportion of these are sponges of the whiteness and quality that indicate a proper care in preparation. When a sponge cucumber is dried whole the netting is easily separated ; but its fibre will have a brownish color and will have lost much of its tensile strength. Naturally, the reticulation is of silvery whiteness, and this can only be preserved by a proper method of cleaning it from rind, seeds and pulp when the cucumber is matured, but still green ; and the whole must be done at one operation or the sponge will change in color. When a luffa has reached its maturity of growth it will be known by its green rind lightening in color and becoming more dry ; it should then be cut off and hung up in the house for a week or more until the juice in large measure dries out of the rind. The cucumber should then be pared and the cap at the lower end removed, which will open the seed channels ; it should then be kneaded and squeezed under a large pan of hot water until the seeds and pulp are washed out. When fully ripe the seeds are jet black, and will number from 400 to 600 in very large fruits. When the reticulated skeleton has been well cleaned, hang it up on a pin-hook and string to dry in-doors, when it should become of silvery whiteness and weigh three-quarters of an ounce to an ounce.

By exposure to the air, even when kept in darkness, the whitest luffa-sponges gradually change to a light orange-yellow. This color is largely soluble in hot water with soap, and much of it may be washed out, leaving the fluid of a decidedly yellow tint and the sponge much lighter in color. Sponges in frequent use become of a light grayish white tint and slowly weaken in fibre, particularly in the outer or circular layer, which is not so tough as the internal longitudinal one. The sponges are quite durable when compared with those obtained from the sea, and are odorless when well washed ; no fabric when wet has as decided an effect as a rubefacient upon the skin, and care must be taken that it does not take too deep a hold where the surface is young and tender. For delicate skins and children the immature skeletons should be selected, or the small end of the mature ones, which is much finer in fibre than the base.

My record of varieties in the *Cucumis reticulatus* amounts to twenty, and these belong to Japan, Moluccas, China, India, Africa, Spain, Cuba, Brazil and Mexico. The tests thus far made go to show that but very few of the varieties will perfect fruit in this latitude, and that it is useless to grow the others, except for ornament or curiosity. The Macrocarpa stands at the head of the list, as it has been repeatedly grown ; the Acutangula, as a curiosity, grows equally well ; the Cuban comes to perfection ; and by starting under glass, the Egyptian may likewise ; the Petola and Mexicana are yet to be tested in a favorable season. Some others have grown well, but the character of the cucumbers does not make their propagation desirable.

The plants designated are quite ornamental and interesting, with their beautiful leaves, large staminate flowers and hanging fruits, borne sometimes as high as a second-story veranda. The Egyptian flower is about four inches in diameter, and others are nearly as large. The staminate-buds grow in bunches and bloom singly, so that the vines are constantly in flower ; all of the blossoms are a bright yellow. The pistil of the productive flower develops into the point of the cucumber, and the long ovary into the fruit, the sepals of the blossom long remaining attached.—*Dr. R. P. Harris before the Pennsylvania Horticultural Society.*

Some Early Native Flowers.

AMONG the first of our wild flowers to bloom are two which are somewhat similar. One the Wind Flower (*Anemone nemorosa*), the other the little Rue Anemone (*Anemonella thalictroides*). So far as their individual attractiveness is concerned it would be hard to choose between them. Both are charming little plants, with white or pinkish flowers about an inch wide, the former ranging rather further to the north than the latter. In transplanting, the latter is much the easier to manage, and, if taken up at almost any season, it will thrive in any ordinary soil. The Wind Flower demands more care, preparation of soil, and is most safely moved in late summer or early autumn. It needs more time to become established than the Rue Anemone. The best soil for such a plant is the one as nearly as possible like that which it naturally selects, namely, a dry loam. When this is not at command a compound of sand, leaf-mold and clay, in about equal parts, well placed under and around its roots, is a good substitute.

Our two Hepaticas (the one with round, and the other with sharp-lobed leaves) have long been appreciated abroad. The first has a variety of tints, from a blue or purple to almost pure white. The other has about the same variety of color, with the addition of pink. Well-established clumps of them in a thinly shaded situation make a display of early bloom which can hardly be excelled by any plants of their season. They like a clay loam with a moderate amount of well-decayed barn-yard manure mixed with it. The flowers will be much more satisfactory in thin shade than in the open sun or in a dense shade, though the plant will do fairly well in either. They may be transplanted at almost any season, yet it takes time for them to become well-rooted, and fairly at home.

The Dog's-tooth Violets, or Adders' Tongues, as they are often called—a term which, I believe, is more common in New England than in the west—are all early bloomers, and, with the several species and varieties from the Pacific coast, one or two from the south, our eastern yellow *Erythronium Americanum* and the white one (*E. albidum*), we have a fine representation of natives in this genus. They are always welcome harbingers of spring, not only because they are early, but because they have attractive flowers and foliage. *E. Hendersoni*, with its purple and yellow flowers, is probably the most showy of them all, but others from our west coast, such as *E. Smithii*, *E. citrinum* and *E. giganteum*, are also very attractive when in flower. From Texas we have a near relative to the white Dog's-tooth Violet, *E. albidum*, var. *coloratum*, which is quite hardy in New England, and is a much better bloomer that the typical plant. Its flowers have a purplish tinge. The proportion of flower-bearing bulbs of *E. Americanum* and *E. albidum*, even in their native haunts, is often very small, and in cultivation it usually grows more so, especially with the latter. In taking up the bulbs of these species I have noticed that the largest, which are usually the flowering bulbs, are generally at the greatest depth, often ten inches below the surface, and I believe that this is why, in cultivation, they are so inclined to divide up into offsets, one large flowering bulb making several smaller ones which do not bloom the second year. I have, in one or two instances, noticed that deeply planted bulbs were less inclined to divide up in this way than shallower set ones, and I think this habit may be partially overcome by deep planting. The best season for transplanting Dog's-tooth Violets is after their leaves begin to turn yellow.

Twelve species and five varieties of Trilliums are native to North America, all early bloomers, and each having special merits to give it interest in any collection. Some of the more showy, such as one would select for an early bed, if the entire list were not used, are *T. nivale*, *T. grandiflorum*, *T. sessile*, var. *Californicum*, all with white flowers; *T. sessile*, with dull purple flowers, but having very large, handsome and durable foliage, and *T. stylosum*, with pinkish white flowers. The white-flowered variety of the purple Trillium is also handsome. These are all easy of culture. The Painted Trillium (*T. erythrocarpum*) should be added as one of the finest, but it is the most difficult to grow, requiring deep planting, excellent drainage, and a light soil rich in leaf-mold.

The Spreading Globe Flower (*Trollius laxus*), with its abundance of creamy or greenish yellow flowers, should not be forgotten among the early bloomers. It gives variety of color, and the large flowers continue for a long time. It is quite desirable for a thinly shaded situation.

The Virginia Cowslip (*Mertensia Virginica*), with its handsome panicle of pale blue flowers and its rich dark green foliage, and the so-called American Cowslip, or Giant Cyclamen (*Dodecatheon Meadia*), with rose-colored or nearly white flowers, are both early and attractive species, requiring no special treatment beyond a rich soil and ordinary culture.

Botanical Garden, St. Louis, Mo. *F. H. Horsford.*

Fig. 36.—The Gardens at Monte Carlo.—See page 194.

The Snowflakes.

THESE plants belong to the genus Leucoium of the *Amaryllidaceæ*, a name derived from two Greek words signifying white Violet; and their fragrance is almost as strong and sweet, while the common name indicates their general resemblance to the Snowdrop.

The genus comprises some eight or nine species of bulbous plants, including those formerly known under the genera, Acis and Erinosma, only two or three of which, however, are worthy of general attention. The Summer Snowflake (*L. æstivum*) is one of the best. It is a native of southern and central Europe, and has been found as far north as the south of England. This plant is perfectly hardy in Massachusetts. It attains a height of from eighteen inches to twenty-four inches. The bulb is comparatively small and roundish; the leaves narrow and bluntly pointed. The fragrant, drooping, campanulate flowers are three-fourths of an inch wide, and appear in early summer, six to nine in a cluster, at the top of a spathaceous scape which equals the leaves in length. The perianth differs from that of a large Snowdrop in having all the white, green-tipped segments of equal length.

L. autumnale, the Autumnal Snowflake, is an elegant little plant, which, unfortunately, requires the protection of a slightly heated greenhouse or frame during the winters of this region, but it will doubtless prove quite hardy in more favored parts of the country. The oblong bulb supports three or four linear-acuminate leaves, about three inches in length, which usually appear, when the reddish scape has already attained its full dimensions, early in autumn. The flowers, usually borne two on each scape, are nearly half an inch in diameter, of similar form to those of *L. æstivum* and white in color, with a profuse display of deep rose around the base. The beauty of its tiny blossoms, combined with its free-flowering propensity, would render *L. autumnale* a very desirable addition to any garden in which it could be safely trusted. It is native on the sand-hills of Algiers, Spain and Portugal, and was introduced to cultivation from the latter country in 1629.

Still more attractive than either of the above species is *L. vernum*, the Spring Snowflake; it is the best of the genus, though hardly of such vigorous constitution as *L. æstivum*. The flowering season opens from two to four weeks later than that of the earliest Snowdrops; but it is much larger, and is, among spring-flowering plants, the gem of all the garden. It is from nine to twelve inches high; bulb oval; leaves six inches long by half an inch wide, obtuse; scape bearing one or two flowers an inch wide, but otherwise like those of *L. æstivum*. It is a native of moist, shady localities in many parts of central Europe, and was cultivated as early as 1596. A variety of this plant, generally named *L. Carpathicum* or *L. biflorum* in gardens, is distinguishable from the species in the very frequent occurrence of two-flowered scapes, and in the divisions of the flowers being tipped with yellow. It was introduced into England from the Carpathian Mountains in 1816. The plant is quite as pleasing as *L. vernum*, and it blooms somewhat later.

The Spring and Summer Snowflakes like good soil, partial shade, and a moist rather than dry situation. They are most effective when planted in large masses. Once planted, the latter may be left to shift for itself, but the less sturdy character of *L. vernum* and variety renders an occasional inspection of their bulbs a necessity. *L. autumnale* should be planted in pots, using sandy loam, where the winters are too severe to

permit of its exposure, and placed under cover until spring, when the pots may be plunged in a dry sunny position, such as is found in the elevated portions of a rock garden. Remove it to the greenhouse, or other place of security, again before frost, and propagate by separating the bulbs after the completion of growth.

Cambridge, Mass. *M. Barker.*

Palms.

THIS is a good time for repotting most Palms, except where a shift was given late in the fall, and even in such case the plants would be benefited by the removal of some of the surface soil and the application of a top-dressing of fresh compost. Some judgment is required even in the simple operation of potting. For instance, if the rapid growth of young plants is desired, the compost should be made rather light and rich by the liberal use of peat and old manure, a very satisfactory fertilizer, and one in good condition for potting, being the spent manure from an old hot-bed. When such manure is used it may be added to the potting-soil in the proportion of one-fourth of the whole mass. For plants almost large enough for their quarters the soil may be heavier and poorer, the deficiency of plant-food being made up with an occasional dose of liquid manure, which will serve to keep up the color of the foliage.

Light-rooting Palms, such as *Cocos Weddeliana*, *Latania aurea*, *L. glaucophylla* and some others, grow best in a soil largely composed of peat and sand, but, for a majority of the strong-growing kinds, a good loam, well enriched, will be sufficient. The drainage of the pots should always allow the free escape of surplus water, but, to secure this, a few crocks, properly placed, concave side down, will do more good than a handful that are thrown into the pot indiscriminately. The question whether firm or light potting is better for plants of this class can hardly be answered directly, for much depends on the character of the soil used, but moderately firm potting is usually good practice, although it must be borne in mind that the coarser the roots the more loose should be the soil, within a reasonable degree.

Some attention should now be paid to shading the houses, else some of the tender species will suffer, and as the growing season for most of the vegetable world comes on, new vigor seems to possess the various insect pests to which Palms are subject. The worst among these are the numerous varieties of scale, all of which are troublesome and are best dealt with by careful washing. Red Spider may be eradicated by thorough syringing, and Thrips by sponging with tobacco solution or by fumigation. Mealy Bug may be more easily disposed of than some of the varieties of scale, and in the same manner.

Most Palms enjoy thorough watering, and as more active growth takes place, a copious supply will be required by all well-rooted specimens. In case some particular specimen does not make satisfactory progress, owing to an unhealthy condition of the roots, it may be improved by washing out the roots and then repotting in as small a pot as possible. This treatment is, however, only recommended for plants of especial value, as the various species that are in common use are so readily and cheaply obtained that it does not pay to nurse unhealthy ones.

The species to which reference has been made above are notably handsome ones, *Cocos Weddeliana* being the most useful dwarf Palm that has been introduced to our gardens.

Holmesburg, Pa. *W. H. Taplin.*

Orchid Notes.

ARPOPHYLLUM GIGANTEUM.—Flowers are the attraction of most Orchids, but in the subject of this note these are supplemented by foliage of pleasing form and color. The massive spikes develop flowers profusely, and they keep in good condition about two weeks if the plant is kept in a cool, shaded house during the flowering period. It is a native of Guatemala and Mexico, and has been grown in England as an exhibition plant for many years past. The slender pseudo-bulbs, from eight to twelve inches high, bear at the top a single coriaceous leaf, from eighteen to twenty-four inches long by two inches wide, pointed, dark green, and elegantly arched. The spike is boldly erect, and emerges from a brown sheath, from four to six inches long, and beyond it the spike is some twelve inches long. The flowers are half an inch long by one-fourth of an inch wide, and closely packed on the portion of the scape above the sheath, as many as 150 having been counted on a space measuring five inches. They are not particularly interesting individually, but in the aggregate they form an attractive cluster, in which a reddish purple color, deepest in the lip, prevails. This plant is found growing on trees at a considerable elevation, and on this account it will not require a great amount of heat, a maximum temperature of eighty degrees during the growing season, with one of sixty degrees when the plant is at rest, proving sufficiently high. It requires plenty of light, a position close to the glass, and when in an active state a plentiful supply of water. The new growths appear simultaneously with the spikes any time between March and May, and they are often seriously injured by keeping the plants dry at that time in order to accelerate the development of flowers. The plant succeeds well in a basket, and it should not be allowed to shrivel with dryness, even after the completion of growth.

CATTLEYA AMETHYSTOGLOSSA.—The last flowers of this gorgeous Cattleya faded with the month of March, after having preserved their richness of color about four weeks. The plant is of striking appearance, and attains a height of some three feet. The erect scape protrudes from a greenish white sheath at the summit of the pseudo-bulb; it is scarcely more than twelve inches high, and two-thirds of its length is enveloped in the sheath, the flowers—twelve to fourteen in number, and each from three to five inches across—being arranged around the exposed portion. The oblong and pointed sepals are lilac-tinged, white, profusely spotted with rose; the petals are broader, rounded at the tip, and, with larger blotches of rose, similar to the sepals in color. The lip is deep purple, with numerous lines of a still darker shade. A number of these dense clusters give the plant a grand appearance, and they develop freely under easy treatment. The heavy head of the plant, as compared with its base, at once suggests a pot as the most convenient receptacle for its roots. Its side and bottom should be well perforated. The plant might also be grown in a basket, but unless this were exceptionally deep, and affording much surface for the clinging roots, the gain would be more than counterbalanced by the plant's liability to topple unless supported. A mixture consisting of fibrous peat, charcoal and crocks, with a good coating of sphagnum, suits this plant very well. A stove temperature and a moist condition about the roots and in the atmosphere are needed during growth; heat and moisture should be somewhat reduced when growth has been completed. The plant should be kept as near the light as possible at all seasons, but sunshine should be excluded during the growing period.

Cambridge, Mass. *M. Barker.*

Transplanting Hardy Ferns.—Spring is, no doubt, the best season for transplanting hardy Ferns, especially when the work is done in early spring. It too often happens that the transplanting is put off until the young and tender fronds have well started or are half-grown, and then it is next to impossible to handle them without injury. After this stage of growth has been reached the transplanting had better be deferred until the fronds mature, and then cut them back one-half or one-third before removal. Some species, like the Climbing Fern (*Lygodium palmatum*), do not transplant well in autumn, and seem to require spring planting. The growing points or buds of the Maiden-hair Fern (*Adiantum pedatum*) are extremely tender and brittle at any time in spring, and when they are packed for shipping great care is needed, or the plants will fail. Few plants pay more richly for the labor spent on them than the hardy Ferns, for, unlike most flowering plants which are attractive only in their flowering season, Ferns are a delight the whole season through. And then they can be put away in the shade, where other plants would not live. Many a dark, not to say an untidy, corner about American homes might be made attractive, and even beautiful, if planted with hardy Ferns and other shade-loving plants.

St. Louis. *H.*

Decay Spots upon Leaves.—Plants with large leaves are often much disfigured by blotches that appear at any place upon the foliage. The cause of these spots is sometimes not easy to determine. An otherwise perfectly healthy Calla-leaf may have a brown spot an inch long and a half-inch wide near its centre, and with no apparent reason for its existence. The probabilities are, however, that some days before a withered blossom of a plant above it fell upon the leaf, and, remaining there for a time, began to decay. Soon after, the force of the water from the hose drove the blossom off, but not until it had left the seeds of decay in the leaf. In other words, the fungus, usually a species of Botrytis, while flourishing upon the rich succulent substance of the blossom, sent its threads into the leaf below and began the decay that finally ruined the leaf. The Botrytis fungus is not usually accused of making

its attacks in a direct manner upon living tissue, but it does not hesitate to pass from the dead to the living when conditions favor it. In other words, the Calla-leaf is safe against the attack of the spores of the Botrytis, but when the vigorous filaments of well-established plants present themselves the resisting power is not sufficient to overcome them. If we had found the remains of the blossom in the centre of the dead blotch it would have been natural to ascribe the cause to the flower or the fungus it harbored, but in many instances the leaf blackens without any apparent cause. Nevertheless the cause remains the same, for the source of contamination had been removed before the decay in the leaf had become perceptible. The practical conclusion is, that no opportunity be given these half-way parasitic fungi to gain an entrance to healthy plants. The gardener knows how important it is to keep all dead leaves and decaying blossoms from contact with the healthy parts. Neatness as well as health demands that the living be kept apart from the dead.

Rutgers College. *B. D. H.*

Correspondence.

Notes from Passaic.

To the Editor of Garden and Forest:

Sir,—"American trees for American gardens," enthusiastically exclaimed a friend while making a tour through the ranges of the Blue Ridge, where is to be found such a variety of handsome trees and shrubs, only partly appreciated by our planters. Very much the same enthusiasm for American flowers moved me a few days since as I strolled through the hill-side garden of Messrs. H. Meyer & Co.'s Passaic Nursery and found many of our native plants well established and in bloom. *Shortia galacifolia*, in flower there, needs no introduction to the readers of Garden and Forest, but it cannot be too often told that this plant is one of the choicest of our native flora. Entirely hardy in this latitude, with beautifully colored firm, persistent foliage and dwarf habit, add to these charming fair-sized flowers, bell-shaped, with graceful curves, petals white, with the most dainty rosy flush borne on pink peduncles, you have a plant to excite enthusiasm. A mass of this gives distinction to the choicest border, and it will flourish, which is a merit not possessed by all Alpines. *Trillium grandiflorum*, *T. stylosum* and *T. pusillum* were well in bloom and happy in the not too dense shade. Erythroniums are now at their very best, with their beautiful maculated leaves and graceful flowers—among them the yellow "Dog's-tooth Violet" (*E. Americanum*), *E. grandiflorum* and *E. giganteum*. The white flowers of *Dicentra cucullaria* were just showing above the daintily cut leaves, while *D. eximia* showed racemes of red above its attractive foliage. If Hepaticas and Sanguinarias were rare flowers perhaps they would be appreciated by us as their beauty deserves, but looking through this hill-side garden and noting the dainty beauties in bloom, and Cypripediums, Sarracenians and others just pushing, and thinking of the succession of native flowers unmatched in their various seasons, the thought was forced on me that we do not appreciate our own treasures. Our hardy plantsmen, however, are finding a larger demand for native plants, and they are a feature in most nurseries. It is curious, though, that if seeds of any but the most common native plants are desired they must be ordered from abroad.

In the more open part of the nursery I noticed good breadths of Aubrietias in full bloom—*A. Græca*, *A. deltoidea* and *A. macrostyla*, the last distinctly the best of the purple varieties, and making a fine mat. *A. Leichtlini* may be a break toward the red, but its dull red flowers are of a color which can be spared from the garden.

Mertensia Virginica (Lungwort) was showing its gracefully drooping flowers; a most valuable plant in not too conspicuous a position. Hellebores are still in full bloom, *H. niger* in varieties and *H. orientalis*, both untouched by the severe winter. *Saxifraga cordifolia* is opening its rose-colored flowers, and is one of the best of the section, but its broad leaves sometimes suffer in hard winters. It will well repay protection. I think it has before been noted that Doronicums are the best early-flowering, large yellow composites. Here *D. Clusii*, *D. plantigeneum excelsum* and the variety Harpur Crewe were in bloom. The latter seems a good form of *D. plantigeneum excelsum* (and the name is much easier). *D. Clusii* is very similar in form, but its finely cut petals are slightly recurved. But space forbids my mentioning all the blooming plants, and I can only note *Arabis alpina variegata*, with flowers like the type, but with white variegated foliage. Great breadths of Narcissi, such as Pallidus Præcox, Golden Spur, Henry Irving and Sir Watkin, give the principal effect of color at this early season.

I noted *Heuchera sanguinea* in the open, strong and vigorous, and only the lower leaves scorched. Evidently this plant may be considered reliably hardy.

Elizabeth, N. J. *G.*

Botanical Nomenclature.

To the Editor of Garden and Forest:

Sir,—In No. 162 of Garden and Forest (vol. iv., pp. 165, 166), Mr. George B. Sudworth, of the Forestry Division, United States Department of Agriculture, discusses the use of binomials composed of specific names identical with generic, brought about by the rigid adherence to the rule of maintaining the oldest specific name, and records himself as in favor of the practice. He alludes to its non-acceptance in my "Catalogue of the Plants of New Jersey," but expresses the supposition that I had good reasons for not using it there. He is in error. I had no good reasons. I was deterred from accepting the well-known practice of zoölogists from simple conservatism.

When, in 1887, the committee of the Torrey Botanical Club which was appointed to issue the "Catalogue of Anthophyta and Pteridophyta growing within one hundred miles of New York," decided on taking the stand of maintaining original specific or varietal names, it was well aware of the revolution which such a measure would suggest, and had no idea as to the measure of support which such a suggestion would receive. Up to that time Professor Greene and myself were the only American botanists, I believe, who had recorded themselves in favor of the practice, and the committee deemed it wisest to await the result of its work before going further, deciding to throw out generic names identical with specific, and not to take up a considerable number of genera whose claim to priority was perfectly well known. In my New Jersey catalogue the nomenclature of the Hundred-mile Catalogue was closely followed, from my being governed by the same considerations of conservatism. However, now that the desired change of opinion, which we have ever since attempted to influence through the *Bulletin of the Torrey Botanical Club*, has been brought about, and, as Mr. Sudworth remarks, "nearly all botanists are thoroughly in unison with the present vigorous movement to place botanical nomenclature on a firm footing," I am heartily in favor of the practice he approves. But I would now favor going considerably further toward the methods of the ornithologists, so far, indeed, as to practically accept most of their "Code of Nomenclature." I would write *Magnolia fœtida* (L.), not *Magnolia fœtida*, Sargent; *Hicoria minima* (Marsh), not *Hicoria minima* (Marsh), Britton; *Catalpa Catalpa* (L.), not *Catalpa Catalpa* (L.), Sudworth. In other words, I would quote the original author of the name, and leave the author of the binomial to be brought out in the synonymy of the species, by means of a check-list or other compilation. This has the advantage of doing away with the double citation and eliminating all personal considerations in the publication of new binomials.

And there is another exceedingly good rule of the ornithologists which I may remark on here. It is to the effect that a generic name or binomial once used in description is unavailable for use for any other genus or species, even if it be shown to be a synonym. "Once a synonym, always a synonym," is a terse and very useful motto, which prevents many troublesome complications.

Columbia College, N. Y. *N. L. Britton.*

Insect Lime, Nevertheless.

To the Editor of Garden and Forest:

Sir,—Allow me to make a rejoinder to both Mr. Smith's and Mr. Jack's exceptions to the application of insect lime.

I appreciate Mr. Smith's warning not to turn a good remedy into a quack medicine, to be used "against all ills," but I must warn him in turn not to diagnose too hastily. There are two points he overlooks—first, that we do not expect our police to catch all the thieves, that a reduction only, and not extirpation, is attainable by all our remedies; and, secondly, that besides the biotic phases of insect life, accidental conditions must also be considered in devising means of protection. Now, while there may not be any voluntary wandering observed in the Tussock moth and Bag worm, as there is with the Gypsy moth, and, to some extent at least, with the Web worm, Mr. Smith, in my opinion, does not appreciate sufficiently the services of wind and rain in downing the larvæ. By these agencies they are thrown to the ground, probably

more than once during the season, and they return, of course, to their food-supply.

During the past few years the trees in the parks and streets of Washington have suffered severely from the ravages of the Fall-web worm, Tussock moth and Maple worm, and any one who has observed the countless numbers of caterpillars thrown down by rain-storms and winds, besides those which migrate voluntarily, re-ascending the trees, will not doubt that preventing this ascent would have a marked effect. Total defoliation would, no doubt, be prevented in many instances, and partial disfiguration at least retarded. The "lime-band" furnishes a cheap, simple, effective barrier. It is in preventing the ascent, Mr. Jack will notice, not the descent, that the "lime-band" becomes valuable, since the Fall-web worms, "both old and young, drop themselves to the ground without spinning when disturbed or sorely pressed for food."

Mr. Smith says that this remedy "does not begin to compare in effectiveness with winter collecting and destruction of egg-masses." This assertion could only be made after proper comparative experiment. Not only has the winter collecting of the pupa—as I know from personal unpleasant recollections—and the destruction of egg-masses by crushing been practiced against the European congener of the Tussock moth by the forest-administrations of Germany, and that on a large scale, but the latter method has been improved by using oils, tar, and, still better, "insect lime," to cover the egg-masses, which is a more radical measure, as it is not liable to miss or throw to the ground as many eggs as is done in crushing.

The only experiment with "lime-bands" against this pest, which was made in a Prussian forest-district (because the above methods have not yet proved satisfactory), under the direction of the well-known entomologist, Dr. Altum, has remained incomplete. It showed, however, that a considerably larger number of larvæ was captured by the bands than the previous counting of the eggs would have led to expect, and that the defoliation on the treated Beech-growth took place at least five weeks later than in the neighboring unprotected growth, an effect which may be considered highly satisfactory. This was during a widespread attack of *Orgyia pudibunda*, when the remedies must be applied over large areas to be effective.

My contention, however, was, in the main, for the application of this remedy, in case of the Gypsy moth, in the same manner in which it has been found effective in its native home.

I would also take occasion again to point out to our economic entomologists, that insect fighting is done on a very large scale by the forest-administrations of Europe, and that it would be worth their while to study the methods practiced there more closely, and profit from experience dearly bought by others.

Forestry Division, Department of Agriculture, Washington. *B. E. Fernow.*

The Sugar Maple in Flower.

To the Editor of Garden and Forest:

Sir,—In speaking of the Sugar Maple in your issue of April 15th you say that "a tree in full flower when standing in the sunshine seems to be enveloped with a luminous mist, and is an object of striking beauty." This peculiar appearance of the Sugar Maple does not occur in this region every year, but just now this tree is unusually conspicuous. This is perhaps due to the fact that the flowers pushed out very rapidly during three very warm days, while the leaves are as yet hardly to be seen. These flowers hang in clusters from every bud, sometimes as many as twenty in an umbel, and on slender pedicels three inches long. The stems as well as the flowers are almost straw-color, and owing to their great abundance the tree is completely enveloped with these swaying tassels. No other trees are in leaf except an occasional Willow or Aspen, so that the Maples stand out from the bare forests and the fields, which scarcely begin to show the grass, in very striking relief. Individual trees can be distinguished at a distance of two or three miles, and are certainly much more conspicuous than usual. I only remember to have witnessed such a display but once before in a dozen years.

I should like to hear some satisfactory explanation of this noteworthy difference in the aspect of the Sugar Maple at this season in different years. Is it simply that the flowers are more abundant, or do they come out more slowly some years, so as to be partially hidden by the foliage, or do they open much earlier in certain years and make so striking a display because there are no other trees in flower or leaf to attract attention?

Morristown, N. J. *R. S.*

Periodical Literature.

Lindenia. Iconography of Orchids, conducted by J. Linden, Lucien Linden, Em. Rodigas and R. A. Rolfe. American edition, Brussels, 1891.

We have received the first two numbers of the American edition of this sumptuous Belgian publication which has now been appearing during the last six years under the editorship of Mr. Lucius Linden, the son of the well-known botanical collector who is honored in the title. The literature of Orchids is singular in the considerable number of handsomely illustrated and therefore expensive works specially devoted to them, published by commercial firms engaged in the propagation and sale of these plants. At the present time *Reichenbachia* and Williams' *Orchid Album* in England, and *Lindenia* in Belgium, all with magnificently colored plates, strive to lay before the Orchid lovers of Europe and of America all that is new, rare and interesting in these plants. *Lindenia* is a worthy rival of its English competitors.

The American edition has been undertaken, the editor tells us in his introduction, "at the request of numerous amateurs of Orchids, who regret that they are not able to profit completely by a work written in the French language." The American edition is to be "carried on in exactly the same way as has the French edition during the last six years, in which 264 species or varieties have already been figured; appearing regularly every month, seeking the accomplishment of the same programme, with the co-operation of the same contributors, and the same artists who have hitherto received the favorable sympathies of the public."

The first figure (No. 265 of the French edition) is devoted to the beautiful new *Cattleya Rex*, a plant which is just now exciting in the highest degree the imagination of the lovers of Orchids, and as an example of the character of the information *Lindenia* is intended to convey, we shall quote at some length what it says of this plant:

"The Cattleya of which we give to-day the representation has been known to M. J. Linden for fifty years, but it was only at the end of last year that it was sent to Europe.

"Originally discovered by M. J. Linden during his travels in South America, it was met with again, thirty years later, by Wallis, who proclaimed it the most beautiful of Cattleyas, but he did not succeed in sending living plants to Europe. Twenty years after this second discovery, one of the collectors whom M. Linden had sent to search for it diligently, succeeded at last in obtaining it, and sent some plants in good condition to Brussels.

"The great difficulty of this search arose especially from the fact that the plant has not, as have Orchids in general, a central district, a place where it may be found in quantity. Also, one of the collectors of Messrs. Linden spent a whole year in the same locality (which it is not yet possible for us to divulge) without seeing or collecting more than thirty plants of this Cattleya during this long period.

"The country in which it grows is, moreover, one of the least accessible in South America, and the journey across the mountains, among rugged rocks, sometimes cut naturally in nearly vertical steps, without even an indicated path, without any base of operations, in the midst of difficulties without number, entail the loss of considerable time, and frequently the life of the plants collected with so much trouble. One can form an idea of the difficulties encountered when it is stated that not only the plants but also the collectors themselves have to be carried for several days on the backs of the Indians.

"These persistent efforts were amply compensated for when one of the plants imported produced in December last a raceme of its splendid flowers, of which we now publish a representation. Seldom has the appearance of a new Orchid made an equally striking impression on the beholder, and yet the flowers were produced on an unmatured growth, and had not attained their natural dimensions. We may affirm that those which will appear this year will be sensibly larger than those represented on our plate. As to color, we do not think it possible to surpass them in beauty. Throughout the whole Orchid family there exist but few gems comparable to the labellum of this species, in which the purple combined with gold is modified into a crimson of the hue of Spanish wine, and the marblings and the veins are of an exquisite elegance."

Cultivators of Orchids will certainly have good reason to complain that the information with regard to the practical details of cultivation, which they have a right to expect in a work of this character, is either omitted entirely or is so very meagre as to be of little practical value. The plates are generally well drawn and very beautifully printed, but the appear-

ance of the book, from the artistic point of view, is sadly marred by the bright red line which surrounds the page of text.

It may be a convenience to our readers to know that Monsieur Linden's address is 100 Rue Belliard, Brussels, and that *Lindenia* can also be procured from all the principal booksellers of the United States.

Notes.

In a report on Forage Grasses, just issued by the Mississippi Experiment Station, Japan Clover is said to yield on rich land from two to three tons of hay to the acre of as good quality as the best Clover hay.

According to the Census Bulletin on Truck Farming, the season at which a given vegetable reaches a marketable size advances northward along the Atlantic coast at the rate of about thirteen miles a day.

The second annual banquet given by the trustees of the Missouri Botanic Garden in honor of Henry Shaw, the founder of the Missouri Botanic Garden and the Shaw School of Botany in St. Louis, will be held in that city on Thursday, the 21st of May.

The census returns show that the average melon-fields of the southern Atlantic states yield 400 salable melons to the acre. Twelve hundred of these will load a car, which will sell in the north for from $150 to $275, which leaves a net return of from nothing up to $150 an acre.

The Third Report of the California State Board of Forestry, which has been noticed in these columns, can be secured from Mr. J. C. Lemmon, of Oakland, California, by remitting ten cents a copy to cover expenses. The previous report, which relates principally to the Pines of the Pacific slope, can be obtained in the same way of Mr. Lemmon.

The *Illustrirte Gartenzeitung*, of Vienna, under the title of "New Roses for 1891," publishes a list of eighty-seven varieties, produced by thirty horticulturists. Five varieties are of American origin: Golden Gate, Henry M. Stanley, Maud Little, Mrs. Jessie Fremont and Pearl River, all announced by Messrs. Dingee and Conard, of West Grove, Pennsylvania.

One of the most curious plants in Europe was a Birch-tree which for about eighty years grew vigorously on top of the unfinished tower of St. Stephen's Church, in Vienna. When, in recent years, the work of completing this tower was begun, the tree was transplanted into the Rath-haus Park, but, in spite of the most careful tending, it died about three years ago.

The office of Commissioner of Forests has been abolished in Colorado. Since this state has been hitherto supposed to take a more enlightened view of the value of her forests than some others, the determination to dispense with any officer whose duty it was to give special attention to this interest is a surprise, and, at this distance, seems like a step backward.

It is about forty years since the Weigelia was first introduced into European gardens from China. German catalogues now note between thirty and forty varieties, most of which have pink or pale crimson flowers, although, in one or two, the flowers are darker crimson, and in about half a dozen are pure white. A few varieties have also been grown with leaves streaked with yellow or white.

From the interesting address on the Sponge-bearing Cucumber, of which we have quoted the greater portion in another column, we learn that Herr E. Dammann, of San Giovanni-a-Teduccio, near Naples, has for years been hunting the world for seeds of the Luffa, which he has cultivated as a seedsman, and that he has secured varieties which are of great interest to botanical collectors. By exchanging with Herr Dammann, Dr. Harris has added materially to his own list of varieties for testing here, and has sent several of the most valuable sorts to Japan, Egypt, Cuba, Mexico and Florida, with a view to improving the varieties there.

A bill has been passed by the legislature of Ohio which creates a park board for the thriving city of Youngstown, and gives it the authority to establish the boundaries of a park, to accept lands for park purposes, and to make necessary regulations for its government and maintenance. The Commission was authorized to make a preliminary survey, with an estimate of the cost of the probable improvement, and submit the same to the vote of the people. The project was sustained by a majority of three to one. We understand that suitable grounds near the city have been secured, and the descendants of the men who inaugurated this movement will bless them for taking steps in this matter before the opportunity was lost of securing the land at a reasonable price.

From Mr. H. B. Ayres, of the Forestry Department, Washington, comes the following note of observations which he made in the forests of northern Minnesota last winter. In slightly timbered regions the "pot-holes" along the hills of drift have a border which is frequently covered by standing water, and upon which trees do not grow. Where the timber has been lately cut away it is a common thing to see a belt of thrifty timber on the moist land encircling the pond-hole, and again inside of this belt of living timber another belt of dead trees and grass above an old shore-line. The inference seems irresistible that denudation causes a more rapid accumulation of water, which means a higher rise of water in the basin, thus killing the trees which had grown up where water had not previously injured them.

A German horticultural journal says that one of the latest inventions in medicine is the use of cold greenhouses in tropical countries as a means of combating yellow fever. This disease, it states, can be conquered if one removes to those elevated regions in which Oaks will grow. This fact recently inspired a celebrated Cuban physician with the idea of reducing the temperature of sick-rooms by artificial means, and wonderful cures resulted. Now it is proposed that, in districts liable to the epidemic, each town shall erect a great glass-house in which plants of cold and temperate regions may be grown, the temperature being artificially cooled instead of heated, as in our greenhouses; and that they shall be devoted to the treatment of patients suffering from the fever.

The California Board of Forestry has memorialized the Congress of the United States on the subject of the water-supply which so profoundly affects the material welfare of that state. Environed as they are on the south and south-east by an arid district almost uninhabitable by reason of its torrid heat, the people of California look upon the enlargement of this inhospitable region with profound apprehension. Their immunity from invasion by this hostile climate depends upon the benign influence of great forests, and the diminution and extinction of these forests must be inimical and fatal to their prosperity. The forest-commissioners, therefore, urge the absolute withdrawal from sale of all the timber-lands in California until future surveys have determined what tracts should be held in permanent forest. And, again, they ask that the timber of such lands, when fit to harvest, should be sold, and not the lands. The lumberman, as a rule, cares little for anything beyond the number of feet of timber to an acre, and, therefore, there will be no loss of revenue in selling the logs only, while, if the fee remains in the United States, the Government can impose such reasonable regulations for preserving the young growth and preventing fire as will insure the perpetual forest-character of these lands and yield future returns of revenue.

A series of field meetings will be held in the Arnold Arboretum during May and June for the purpose of supplying popular instruction about the trees and shrubs which grow in New England. They will be held on Saturday mornings at ten o'clock, and on Wednesday afternoons at three o'clock, beginning on Saturday, May 9th, and will be conducted by Mr. J. G. Jack. The class will assemble in the lecture-room of the building of the Bussey Institution, where a brief review will be given of the plants to be especially observed during the meeting of the day. It will then adjourn to the plantations and the nurseries of the Arboretum for an informal study of the plants themselves. It is not proposed that the instruction given in these meetings shall be technical, and a knowledge of descriptive botany is not essential for persons who desire to follow them. The intention is to indicate, by comparison, the easiest means of distinguishing the common native trees and shrubs as they appear in this part of the country, and of recognizing the foreign species which have been introduced into our gardens. The ornamental and useful properties of trees and shrubs, their habits of growth, their peculiarities and common diseases, will be considered, the different plants being taken up, as far as possible, in course as they become conspicuous by flowering. An hour and a half to two hours will be devoted to each meeting. During the season it is expected that the class will be conducted to at least two well-known gardens in the vicinity of Boston. Applications or further inquiries may be addressed to Mr. J. G. Jack, Jamaica Plain, Massachusetts.

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The Douglas Fir.

THE Douglas Fir, from many points of view, is one of the most interesting trees of the American forest. Its monotypic character, its probably recent development in its distinct existing form, for the record of the ages has not divulged the secrets of its ancestry, the vastness of the region it occupies, its size and value to man, its beauty and capacity of adapting itself to new surroundings, all make the Douglas Fir an important inhabitant of the forests of western America—forests remarkable for the variety, size and value of the cone-bearing trees of which they are principally composed.

The Douglas Fir is distinguished from the true Firs or Abies by its petioled leaves, which, in falling, leave oval scars, by its pendulous cones with persistent scales, and by its seeds, which are not furnished with resin vesicles. It looks, moreover, in general appearance, more like a Hemlock than a Fir; it differs from the Hemlock, however, in the absence of the permanent, persistent bases of the fallen leaves which roughen the branchlets of all Hemlock-trees, and in its much larger cones, which may be always recognized by the large acutely two-lobed and long-pointed bracts extended beyond the scales. It can be readily known, too, by the flat, distinctly stalked leaves which are somewhat two-ranked by a slight twist at their base.

Where climatic conditions favor the growth of large trees, as they do in the humid region of western Washington and Oregon, or on the middle western slopes of the northern Sierra Nevada, the Douglas Fir often rises, in the course of five or six hundred years, to the height of three hundred feet, and forms a trunk ten or twelve feet in diameter above its enlarged base. The bark, which, like that of the Hemlocks, contains a considerable amount of tannin, is thick, deeply furrowed, and dark brown or red, or sometimes gray, in certain situations. Young trees, like young Spruces and Firs, are pyramidal in form, and retain their lower branches for a considerable time, sometimes even for two or three hundred years, when the individual finds sufficient space for their lateral growth, as it does occasionally when it has stood on the margin of the forest or on the steep slopes of some mountain cañon. Usually, however, the trees stand close together, especially in those parts of the country in which, under the favoring influences of a heavy rain-fall, they grow to the largest size, and then their great trunks tower upward, for a hundred feet or more, without a branch. The leaves are linear and generally obtuse, an inch or an inch and a quarter long, dark green and very abundant, covering the long, slender, graceful branchlets. The flowers of the Douglas Fir are produced from the axils of the leaves of the previous year, the males surrounded by conspicuous bud-scales, the females much shorter than their narrow bracts. The cones, which are subcylindrical, ripen the first year, and vary in length from two to four inches. The seeds are triangular, convex, and red on the upper side, flat and nearly white on the lower side, with short wings, broad at the base and acute at the apex.

The Douglas Fir extends from latitude fifty-five north, where it is found in the coast ranges and on the interior plateau of British Columbia, southward through all the region west of the Cascade and the Sierra Nevada Mountains to southern California. It is abundant in the Rocky Mountains from British Columbia far into Mexico, extending eastward to their eastern slopes in Montana, Wyoming, Colorado and Texas; it is common on the Wahsatch and Uintah Mountains in Utah, but is unknown on the ranges of the great basin and on the eastern slopes of the Sierra Nevada. It is most abundant and reaches its greatest size on the low glacial plain which surrounds the shores of Puget Sound. Here the Douglas Fir can be seen in all its majesty. It is the most common tree in a forest in which trees stand so close together that the traveler can barely push his way between their mighty trunks which support far above his head a canopy so dense that the rays of the sun never pierce it. Through these dark and awful shades the most thoughtless man cannot pass without experiencing that sense of solemnity and awe with which the human mind is impressed when confronted by Nature in her grandest manifestations.

The Douglas Fir grows almost as large on some of the California mountain-slopes as on the shores of Puget Sound, and it is one of the remarkable things about this tree that it flourishes at the sea-level and on high mountains. In California it often grows to a great size at elevations varying from 6,000 to 8,000 feet above the sea, and sometimes ascends on the Rocky Mountains of Colorado to even higher altitudes, although it is always smaller and less valuable as a timber-tree in the dry interior portions of the continent than in the moist coast region.

Other trees of the Pacific forest produce more valuable wood than the Douglas Fir—the Port Orford Cedar, the Sugar Pine and the Redwood. These trees are confined to a comparatively small region, however, and the Douglas Fir, in view of the great territory over which it has spread, must be considered the most important timber-tree of western America, and of no other tree is there now standing such a body of valuable and available timber. The wood of the Douglas Fir is hard, strong and durable; it may be recognized by the numerous spirally marked wood cells which distinguish it from the wood of allied conifers. The small cells which are developed in the wood of conifers at the end of the growing season are very numerous, and form broad bands which often occupy half the width of the layers of annual growth. These bands of small cells are dark colored and conspicuous, and become hard and flinty with exposure, making the wood of this tree difficult to work except when it is freshly cut. Some trees produce light red and some yellow wood, and individuals vary to a much greater degree than those of most other trees in the time required for their sap-wood to turn into heart-wood. The yellow wood is closer-grained and is considered much more valuable than the red wood. Lumbermen recognize

these two varieties and pretend to be able to distinguish the trees which produce them, an assumption which still needs demonstration. The conditions which lead to the formation by the same species of such different wood are not well understood; in the case of the Douglas Fir they are probably due to soil and elevation, and, in part at least, to the age of the individual. The wood of the Douglas Fir is known in commerce as red fir, yellow fir and Oregon pine, the last name belonging, however, more properly to the wood of the Yellow Pine (*Pinus ponderosa*) of western America. It furnishes the principal product of the immense saw-mills situated on Puget Sound, and is manufactured, besides, wherever forests of this tree exist; it is used for all sorts of building purposes and for construction, railway ties and fuel.

The Douglas Fir was discovered late in the last century by Archibald Menzies, Vancouver's surgeon and naturalist on his voyage of discovery; and a few years later Lewis and Clark found it in Montana during their transcontinental journey. David Douglas rediscovered it on the Columbia River in 1825 and introduced it into England; and it is the name of this bold and enterprising botanist which has become associated with this tree, although, unhappily, it cannot bear it in the language of science. No tree is more unfortunate in its name; and there are few instances where the application of the rules which govern botanical nomenclature has produced a more unsatisfactory result. Lambert, who first named the tree, called it *Pinus taxifolia*, from the fancied resemblance of the leaves to those of the Yew-tree; then Lindley, disregarding Lambert's specific name, named it *Abies Douglasii* in honor of its rediscoverer. Carrière, recognizing the characters which separate this tree from the true Firs, coined for his genus a bastard word, half Greek and half Japanese, and called it Pseudotseuga, a perfectly improper name, as it has little in common with Tsuga, the Japanese name for the Hemlock. Carrière retained, however, Lindley's Douglasii, calling the tree *Pseudotsuda Douglasii*, but as Lambert's specific name is the oldest, the Douglas Fir must be known as *Pseudotsuga taxifolia*, a name bad in every way, and especially bad in its failure to recognize the name of Douglas, which, more than that of any other man, should be associated with it.

The Douglas Fir has proved itself in cultivation to be an ornamental tree of great value. The largest specimen in England is already more than 110 feet high, with a stout trunk furnished with branches from ground to tip, and showing no signs of diminishing vigor or beauty. The earliest attempts at cultivating the Douglas Fir in the eastern states were not successful; the trees raised from seed, gathered in the mild and humid climate of the north-west or in England, first planted here were unable, except in exceptional positions, to support our climate for any length of time. The late Dr. Parry, however, in 1862 discovered the Douglas Fir growing on the eastern slopes of the Rocky Mountains of Colorado in a climate distinguished by the severity of the cold of winter and by the drought of summer; he sent seed to the Botanic Garden at Cambridge, and the plants raised from this seed have proved hardy in the most trying situations in New England. Some of these trees are now more than twenty feet high, and although it is too soon to speak with anything like certainty in the matter, there is reason to hope that they will grow to a large size and retain their beauty for many years.

Much attention has been given to the Douglas Fir of late years as a subject for forest-planting in Europe, although the best authorities on such matters do not yet agree as to its value for this purpose. Large experimental forest-plantations are made every year, especially in some parts of Germany, where some forest-experts believe that the Douglas Fir is to rival and finally replace the Larch in Europe as a timber-tree. It has the merit of growing with surprising rapidity and of producing a large amount of timber in a comparatively short time. Few coniferous trees grow as rapidly as the Douglas Fir, and it is not uncommon to see self-sown seedlings in Washington and Oregon producing, when they stand very close together in good soil, annual shoots twelve feet long.

A remarkable form of the Douglas Fir, distinguished by its large cones, occurs on the San Bernardino Mountains, in California. It has been considered a variety of the typical tree, and by some botanists a second species—a view supported by the fact that no intermediate forms connecting it with the type have been found, while in the region north and south of that occupied by this large fruited tree the typical Douglas Fir abounds.

The beauty of the trunk of the Douglas Fir and the spread of its great buttress-like roots are shown in the illustration on page 211. It is from a photograph by Notman, of this city, and represents a tree of medium size standing in the park at Vancouver, in British Columbia.

A California Cemetery.

THE most beautiful cemetery in California, the one that is more nearly what a cemetery should be than any other in the state, is Mountain View, near Oakland. It is a nest in the foot-hills, shut out from harsh winds, and so varied in surface that when Mr. Frederick Law Olmsted drew the plans, about 1865, he is said to have expressed the greatest pleasure in the "opportunities for landscape-gardening" that the tract afforded. Owing to unfortunate complications, Mr. Olmsted's plans for the University grounds were neglected, but the Mountain View Cemetery is his sufficient memorial on the Pacific coast.

For twenty-five years a group of prominent Oakland men have worked together developing a beautiful garden of the dead. In some portions there is too much expensive and grandiose monumental glitter, but for the most part good sense and modesty prevail, and trees, vines, flowers and running water unite to make a quiet loveliness. This very March morning as I sat in a perfect tangle of trees, Roses and wild Blackberry-vines in the winding valley that crosses the grounds from hill to hill, I heard the shrill piping of California quail in the copse, and presently saw a very gentle-minded "cotton-tail" rabbit a few yards away meditating on the phenomenon of a reporter's pencil and pad. Looking up I saw three humming-birds poised above the Cherry-blossoms of some old trees in a half-acre orchard planted by some pioneer, and left by the landscape-gardener to give a pleasant homely effect to this part of the grounds. All the while birds kept singing everywhere—golden orioles, brown robins, meadow larks, hosts of blackbirds in the tree-tops. Such places as this are in all the ravines; the rounded hills are planted with flowers and shrubs, but most of the trees are set in the richer soil below.

The late superintendent, Mr. William Collins, was a man of much executive ability, a Scotsman of the Scots, and absolutely devoted to the enterprise. He made every square rod of the land produce growth and beauty. Many flowers bloom even in midwinter at Mountain View, and miles of Rose borders, in which all the newest sorts are represented, extend along the drives. Masses of Iris, Lilies and Daffodils, and the simple old-fashioned flowers that appeal to every heart, remain to illustrate the late superintendent's methods. In the way of trees he planted great numbers of Magnolias, English Laurels, Oranges and the finer broad-leaved evergreens, with Acacias and the rarer conifers, but the latter have been but sparingly used, except in a few bold masses. An almost continuous belt of Eucalypti, Monterey Cypresses and Pines sweeps around the western and southern sides of Mountain View and shuts out the city beyond. Higher hills lie to the east, and over these the cemetery can be extended whenever it is necessary to have more room. In this wilder region there are many ledges of rock that stand out of the hill-side like Cyclopean walls. A few similar ledges are within the present limit of the cemetery, and are covered with vines and rock-plants, sach as Cacti, Cistuses and the low succulents. Several large boulders of trap-rock have been used as monuments, and the possibilities in this direction of the castle-like ledges of the adjacent tract are certainly very striking. One of the rock-piles stands at the head of a ravine overlooking the whole valley, and covers a parallelogram of fifty by a hundred feet in extent, and rises forty feet above the slope. Five or six good specimens of *Quercus agrifolia* grow upon the top of the splintered ledge, and it would be easy to hew out a vault beneath their roots, if one chose, and to cover the whole pile with vines. Such a "memorial mound" would be far more in keeping with Mountain View, as it was planned, than the stateliest mausoleum of polished Rocklin granite or Amador

marble. The late superintendent chose for his own monument an isolated moss-grown boulder, upon which an inscription will be placed, but nothing else will be changed about it.

I spent an hour in the more cultivated parts of the cemetery a few days ago, and was particularly interested in studying the blooming plants there. Mountain View, as I have already said, is one of the most sheltered nooks in the region of San Francisco Bay, and the climate is surprisingly mild. The Orange and Lemon grow and fruit there, and Roses bloom earlier there than anywhere else in the district. On the 20th of March there were Apple, Peach, Plum, Almond and Cherry in the old orchard; long rows of English Laurel; about thirty kinds of Roses, with Japan Quinces, Spireas, Acacias, with immense clumps of Irises, and white and rose-colored Peonies on the hill-side. Nasturtiums, self-sown last autumn, and seedling French Marigolds mingled with wild Poppies and early Lupines, and in many a nook the native flowers of the coast range still hold their own, while the slopes beyond are splendid with spring annuals in full bloom. This is the cemetery of which the lamented E. R. Sill wrote in his poem entitled "Home":

> There lies a little city in the hills;
> White are its roofs, dim is each dwelling's door,
> And peace with perfect rest its bosom fills.
>
> There the June mist, the pity of the sea,
> Comes as a white, soft hand and reaches o'er
> And touches its still face most tenderly.
>
> Unstirred and calm, amid our shifting years,
> Lo! where it lies, far from the clash and roar,
> With quiet distance blurred as if thro' tears.

Such is the spirit of the place, and, as time goes by, that spirit will ripen as its trees grow old and all its bare rocks become more weather-stained and moss-grown.

Niles, Cal. *Charles Howard Shinn.*

The Sap and Sugar of the Maple-tree.—III.

THE linguistic evidence of the *Anthropologist*, introduced by Mr. Henshaw and continued by Mr. Chamberlain, is interesting as well as comprehensive, and not only valid, but perhaps as convincing as the narrations of history.

It reaches back far beyond the advent of that class of European travelers who are said to tell stories by inclination and truth by accident. It is independent of the romances of discoverers and of the neglect of historians. It draws out the history of the Sugar Maple and its products from the very elements of the Indian language. It also takes account, as it should, of their myths and legends, and especially of their solemn rites and celebrations as illustrating past events in ceremonies and figures as by a sign language, through which preceding ages are yet telling events which transpired in their times. This argument from language, in its simplest form, as stated by Mr. Henshaw, is essentially this—namely, "That if investigation shows that the Indian name for European sugar is the same as, or a derivative from, the Indian name for maple-sugar, and especially if the name of maple-sugar is derived from the Maple-tree, we can hardly expect to find better evidence of the fact that maple-sugar was truly an aboriginal production."

For if sugar had been introduced to the Indians by Europeans, the Indians would naturally have adopted the name or sounds under which the new article came to them, as nearly as their word sounds would allow, as is found to have been quite a constant result in respect to various new objects introduced to them under foreign names, of which many illustrations might be given. The exceptions to this rule seem to be in the case of novel animate objects, impressive at first sight, to which they sometimes give a name of their own coining, compounded from the name of a familiar object with a new and characteristic affix.

A few of the facts brought out in the articles referred to, as to the legends and sacred rites of the Indians and the signification of the names relating to the Maple-tree, have been selected for notice here as illustrating more clearly the way in which the investigation has been commenced, and the method in which it will be carried on.

We are told that among the Algonquian tribes there were many myths and legends relating to the Maple-tree.

For the Chippewas, an "Ovid"-like "metamorphosis" of Nishosha, the magician, took place, and in a few seconds he stood a tall and stiff Maple-tree.

Then, too, a certain month of the year was called by some Indians the "Sugar Month," or "Sugar Moon," which could hardly have been unless sugar-making were aboriginal.

Others believed that the snow which melted in the spring furnished the trees with sap—the snow being only "the dripping oil" of the celestial bear slain by the hunters in the winter-time.

Another evidence of the antiquity of their sugar-making is in their ancient religious festivals instituted to the Maple, as the Maple Dance, and the sugar festival in the spring, when the old sugar and the new are mingled by the medicine-man and the aid of the Great Spirit is invoked. Such a conclusion is fully sanctioned by A. de Candolle, who says: "Rien ne montre mieux l'antiquité et la généralité, que cette fusion intime avec les usages religieux d'anciens habitants."*

By way of word illustration, it is stated that the Ojibwa word for maple-sugar is "*Zeence-zee-bah-quod*," which is pronounced *Sen-se-pah-qwot*. Derivation: *Zeence-zee*, drawn from; *bah-quod*, wood or stick, referring to the sap drawn from the tree.

Enin-ah-tig weesh-ko-bun is also employed. Derivation: *Enin*, man; *ah-tig*, wood or stick [tree]; *weesh-ko-bun*, sugar—hence, man-stick-sugar.

"The etymology here," Mr. Henshaw states, "contains a metaphorical reference to the manner in which the sap flows from the tree, as curious as suggestive."

The name so well accords with the natural growth and polysynthetical character of Indian words, and is so paralleled by names of water-falls in foreign countries and languages that it carries in itself the evidence of its origin.

The far-extended Algonquians have corresponding names whose origin seems to have been similarly derived, as Hard Maple, *An-in-a-tik;* Sugar, *Si-si-pak-wat;* Maple-sugar, *An-in-a-tik si-si-pak-wat.*

The Ojibwa form for Sugar Maple, *Nin-au-tik*, seems without doubt to be the same as *Enin-ah-tig*, "*e*" being dropped for easy pronunciation, and to mean not, as Tanner suggests, "*our* tree," but simply, *Enin*, man; *ah-tig*, tree, stick; hence *Nin-au-tik*, man-tree, again.

No doubt, as Mr. Henshaw suggests is probable, "Tanner's etymology is faulty" in this case. The only other etymology which Mr. Chamberlain considers of any weight here is that of Cuoq, who explains *in-in-a-tik* as meaning "*the tree*" par excellence. Yet in this he defers quite too much to Cuoq's authority, and has to regret that the doing so "seems to cast little light on the real question."

If Mr. Chamberlain, to use his own language, "would make the word in question signify 'man-tree,' either from a conception of the tree as man-like (with respect to the sap probably) or from some myth such as that noted above," it seems as if his path here would be full of light. With all respect for the lexicography of Cuoq, the question here is one in which considerations of anthropology are paramount to those of a doubtful etymology.

But whatever may be obscure or uncertain in minor details of the various words of the many divisions of the Indian race, still, as a rule, in the long list of names for the Maple-tree, Sugar-tree, maple-sugar and for sugar *per se*, not a name (with a single exception) as yet is found which resembles, or has relation to, any European name for sugar. The single exception in the case of the Cree language establishes the general rule, from the fact that it is to white (French) sugar only that they give a special name—*So-kaw*—evidently their adoption into their own tongue of the French word *Su-cre* by its nearest kindred sound.

To place the subject more clearly before the eye of the reader, a few of the names in question taken from the *Anthropologist*, and as used by different families or tribes, are here annexed:

Indians.	Hard Maple.	Sugar.	Maple-Sugar.
Ontarios	*An-in-a-tik.* Man-tree.	*Si-si-pak-wat.*	*An-in-a-tik Si-si-pak-wat.* Man—tree—sugar.
Two Mountains	*In-in-a-tik.* Man-tree.	*Sin zi-pak-wat.*	*Sin-zi-pak-wat.*
Another settlement	*Nin-a-tik.* Man-tree.	*Sinz-hab-ak-wat.*	*Nin-a-tik Sinz-hab ak-wat* Man—tree—sugar.
In Cree	*Sisi-bask-wat-at-tik.* Maple-tree.	*Sis-i-bask-wat.*	*Sis-i-bask-wat.*
Ojibwa	.....	.....	*Zeence-zee-bah-quod,* pronounced *Sen-se-pah-qwot.* Expressed from tree.
Omaha and Ponka	*Ja-ni-hi.* Wood—sap—tree.	*Jan-ni.* Wood—sap.	
Winnebago	.....	*Ta-ni-ju ra* Tree-water, or rain.	
Tuscarora	.....	*U-ren na-kri.* Tree—sap.	

* L'Origine des Plantes cultivées, p. 315. Paris, 1883.

A mere inspection of these names seems to make clear what has been stated, that not only were they not derived from any European name or description of sugar, but that, whatever may be the difference in the dialects or language of different tribes, they all agree in referring sugar to the Maple-tree, and to the flow or rain of sap which runs from it so freely in the spring. And when we estimate the natural force and internal pressure of the sap when most active in trees, the suggestion that the idea of pressure exerted to express the sap applies better to the Sugar-cane than to the Maple, loses all its force. It is true that more extended information as to Indian names for the Maple and for sugar is desirable, and it is to be hoped that the investigation of them will be pursued through all the languages of the tribes within the habitat of the Sugar Maple. But whether it takes place sooner or later only one result can be anticipated.

The historical facts adduced show maple-sugar to be a product we owe either to the Indian or to the French. But the French, whether clergy or laity, always in their writings treat the sap and the sugar as novelties to be explained to their correspondents; and no claim on the part of the French to its introduction by them has yet been found. On the contrary, both the cleric Lafitau and Bossu the chevalier explicitly agree, though writing at different periods, in ascribing its origin to the Indians themselves—a conclusion which it is difficult, if not impossible, to avoid.

The linguistic evidence, so far as brought out, is remarkably consistent, and points with equal directness and force to the same conclusion.

As the evidence of history and of language thus combine to support the same proposition, it seems only reasonable to accept their decision, that it is, after all, to the Indian that we are indebted for the important and national product of maple-sugar.

Providence, R. I. *William D. Ely.*

Winter Studies of the Pine Barren Flora of Lake Michigan.—III.

THE Huckleberry and the Blueberries are objects of interest in their winter appearance. Four species, representing two genera, are found here. All have reddish or purple branches, whatever may be the color of the bark in summer. The Black Huckleberry (*Gaylussacia resinosa*) often looks rusty, even to the smaller twigs, imparting to the shrub, as a whole, a sombre look. It branches freely, with an irregular, straggling spray. Many of the twigs are red or reddish, and the small buds on them of a brighter red. It averages about two feet in height, but attains three or four feet in damper and richer soils, equaling smaller stems of *Vaccinium corymbosum*, near which it may be growing. It is very abundant on the sand-ridges, especially where they are open, and the Pines have given way to the Oaks. The Low Blueberry (*Vaccinium vacillans*) grows along with it, and is about as common. It is not quite as tall, averaging a foot and a half, and is a prettier plant in its winter garb. The main stem has a smooth, light-gray bark, frequently greenish above, crossed and checked with fine cracks, forming a mesh of dark lines. The branches are short and spur-like, somewhat regularly arranged around the stems. They start out horizontally, but soon curve upward. The fresh-grown twigs and smaller parts of the branches are usually pale red or pink, and contrast very clearly in color with the body of the plant. Such branches, as well as those of Gaylussacia, look as if they had been dipped to a certain depth in a red dye, the line of division between the red and the gray bark being abrupt and sharply drawn. The bud-scales are of a darker red than the twigs, and the buds near their ends prominent. In the Dwarf Blueberry (*V. Pennsylvanicum*) the whole plant is reddish purple, or the lower part of the stem may be green and the top colored. Its height is about a foot; the branches are irregular and ascending, making an acute angle with the stem, and the buds are quite large, with scales bright-colored like the bark. The Dwarf Blueberry generally grows in damper places than the two just mentioned, fringing the open places occupied by sloughs or wet ground, taking the border-land between the wet and the dry, where it thrives best. But the three grow together in many localities, and, though no close lines of habitat can be drawn, they prefer those mentioned, and are about equally abundant. The largest of the Vacciniums, *V. corymbosum*, the Swamp Blueberry, is of limited range, being found on the borders of a few of the ponds and Cranberry-marshes. The canes are from three to seven or eight feet high, the thickest of them barely an inch in diameter, the shrub being considerably smaller than those found in the Tamarack swamps, which are its more usual habitat. The grayish, flaky, outer bark of the older stems is easily detached, coming off in spots and exposing the brown inner bark, giving them a mottled look when this occurs. The new shoots and twigs are red, the longest of them straight and brier-like, though with a bark more shining than that of the Dogwoods, in this respect resembling some of the Willows. The bark of this fresh growth is slightly roughened by countless specks of a lighter color, appearing like minute blisters, and contributing a pretty feature to the comely shoots.

With the Dwarf Blueberry, but oftener in wetter ground, will be seen the purple stems of the Running Blackberry (*Rubus hispidus*). They are very slender, and clothed with an abundance of weak, reflexed prickles. The leaves are quite persistent, becoming dark purple in autumn, and clinging to the vines in winter. Sometimes, when the winter is mild, the leaves of the Strawberry persist, turning purple like those of the Running Blackberry, and appear quite fresh when in sheltered spots where they are partly covered by fallen leaves, or protected by the branches of some low-growing Pine.

Englewood, Ill. *E. J. Hill.*

New or Little Known Plants.

Encephalartos Frederici Guilielmi.

THIS remarkable and extremely ornamental Cycad was introduced into England in 1877, when stems of it were forwarded from Grahamstown to Kew as "a new species of Encephalartos, with fronds like those of *Cycas revoluta*, the crown of the stem clothed with wool to the thickness of about an inch." The specimen represented in the illustration on page 209 was one of these. Soon after its arrival it developed a whorl of female cones, each about nine inches long, which, however, had to be removed to save the life of the plant. So far as I know, it has not attempted to flower since. It is now a handsome specimen, the stem being five feet in circumference, nearly three feet high, crowned with one hundred and seven leaves, each three feet long, rigid and spineless. The pinnæ are narrow, set closely together, conduplicate, gray-green and spine-tipped. A whorl of new leaves is produced every year, the last whorl consisting of no less than thirty-four full-sized leaves. The diameter of the head is seven and a half feet.

There are about a dozen species of Encephalartos, all natives of tropical and southern Africa. They are all represented by living examples at Kew, where many of the specimens are of very large size. *E. caffer*, *E. Altensteinii* and *E. horridus* are veritable giants in the Palm house, the conditions in which appear to be peculiarly suitable to this genus. *E. brachyphyllus* and *E. Ghillinckii*, both natives of the same region as *E. Frederici Guilielmi*, namely, Kaffraria, and both near allies of that species, may be grown in an ordinary greenhouse if kept a little dry in winter. All the other kinds are happiest in a sunny stove.

The cones of some of them are very ornamental, the female cones of *E. villosus*, another south African species, being, when ripe, at least twice as large as the largest pine-apple, the color of the large, fleshy scales being rich, orange-yellow, that of the nut, like fruits half-hidden beneath them, a brilliant scarlet. In the woods along Buffalo River, near King William's Town, this species is as plentiful, and produces a somewhat similar effect to that of the male fern in the woods of England. The fruits, if allowed to remain till they ripen, are destroyed or greedily eaten by the monkeys and large birds, but in the vicinity of towns they are favorite ornaments with the colonists, who cut the cones in their green state and take them home to ripen.

Some of the species produce very large cones, as, for instance, *E. Altensteinii*, recently figured in the *Botanical Magazine* (t. 7162). This has a female cone eighteen inches long by thirty inches in circumference, the fleshy scales packed closely together, and orange-yellow in color. A male plant at Kew developed two cones last year. Sir Joseph Hooker mentions a huge specimen of this species which was seen by a Mr. Sanderson "in a secluded valley in Natal, about thirty miles from the sea, the trunk of which measured sixteen feet before branching, and twenty-five to the crown, which was formed of five branches."

For large conservatories these plants have a special value, being bold and handsome, the fronds exceedingly durable and not easily injured, whilst they are so robust in constitution that it takes a considerable amount of bad treatment to affect their health. In the southern states of America most of them

would probably flourish if planted in the open. Any one who has seen these plants at their best must admit that, whether among large Palms in conservatories, or planted in masses or as single specimens out-of-doors, they produce a particularly grand effect. Some of the specimens at Kew must be something like a century old. That here figured, for instance, had a stem as much in diameter, and only a few inches shorter, thirteen years ago than it has now, although it has been in vigorous health almost from the first. The photograph from which this illustration has been prepared was taken in 1883.

Kew. *W. Watson.*

Foreign Correspondence.

London Letter.

LACHENALIAS.—Mr. Moore, of the Glasnevin Botanical Gardens, Dublin, read a valuable paper on these plants and their cultivation in London last week. So far as I am aware, nowhere are Lachenalias grown so successfully as at Glasnevin, the spikes of flowers produced there being almost as strong as Hyacinths and the substance of the flowers almost as great. Such kinds as *L. tricolor*, *L. Nelsoni*, *L. quadricolor*, *L. aurea*, *L. pallida*, *L. orthopetala* and *L. pendula* Mr. Moore can produce with spikes a foot long, the stalks as thick as a man's little finger, and the flowers correspondingly large. As commonly seen, Lachenalias are not good garden plants, but no one who saw the fine examples with which Mr. Moore's lecture was illustrated would deny to them a place among the very best of early spring-flowering bulbous plants for the greenhouse. A considerable number of hybrids have been raised, some of them by Mr. Moore himself, the best of them being *L. Nelsoni*, which was obtained by crossing *L. aurea* with *L. tricolor* about ten years ago. There appears to me to be in Lachenalias material which in capable hands would soon produce a race of most valuable garden plants. The splendid and varied children of the comparatively poor *Hyacinthus orientalis* may be pointed to as examples of what has been done by selection, etc., with a plant very closely related to Lachenalias.

HÆMANTHUS MULTIFLORUS.—This is one of the most beautiful of the thirty-eight species of Hæmanthus now known, its large umbel of rich crimson flowers with golden anthers being very handsome. In one of the stoves at Kew there is a plant of it now bearing an umbel eight inches through composed of about sixty flowers, each an inch and a half long, with linear reflexed segments, and stellately arranged stamens one and a half inches long. The scape is scarcely a foot in length, and it precedes the leaves, springing from the centre of a globose bulb three inches in diameter. This and *H. Kalbeyeri*, *H. Abyssinicus*, *H. tenuiflorus* and *H. filiflorus* are all alike or very nearly so. It is quite tropical, and should not be kept dry at any time. *H. multiflorus* was introduced many years ago, but it has never found much favor, because of its bad behavior, as a rule, under cultivation. In this respect it is inferior to *H. Catherinæ*, *H. cinnabarinus* and *H. magnificus*, which are equally beautiful and at the same time easily kept in health.

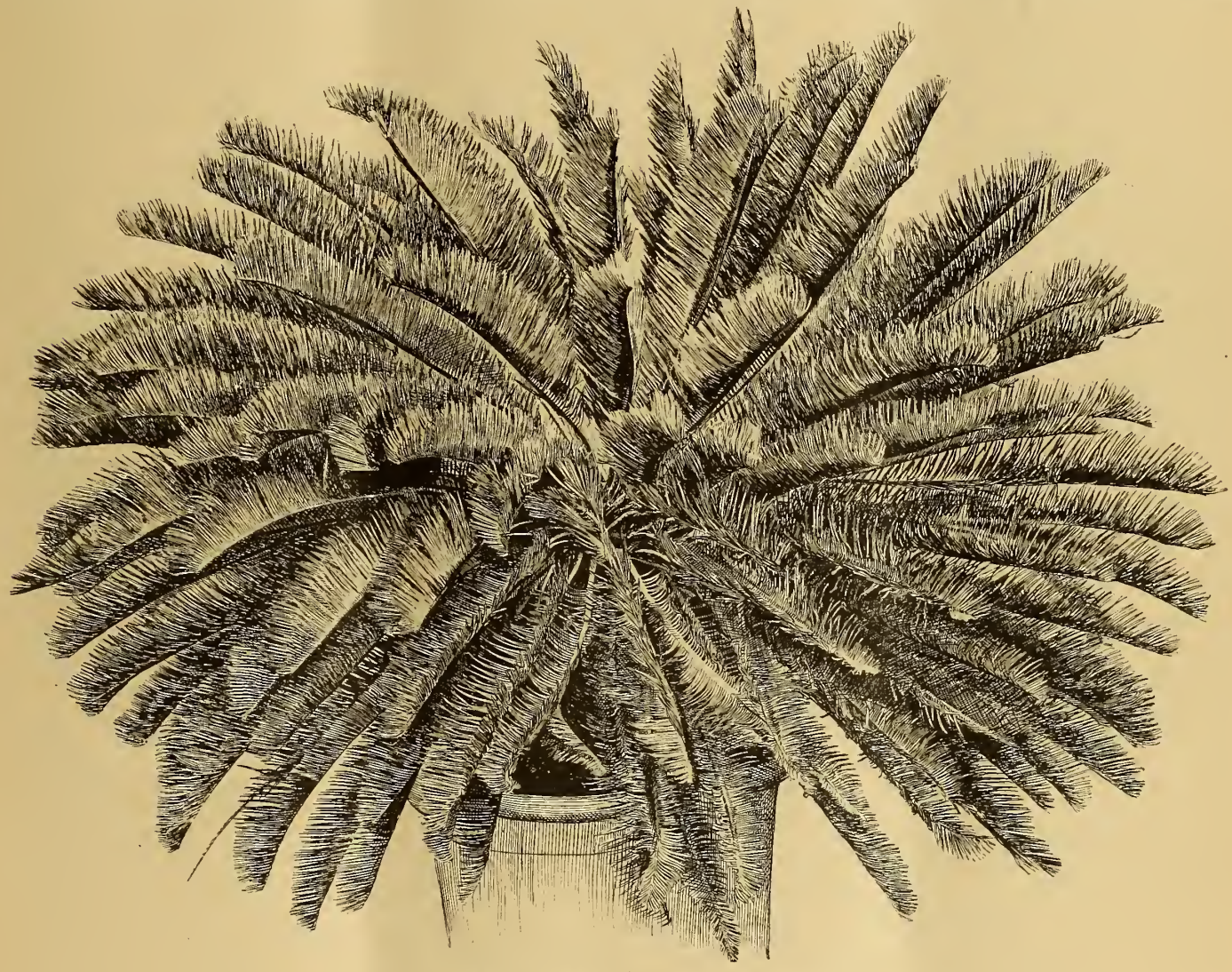

Fig. 37.—Encephalartos Frederici Guilielmi.—See page 203.

GREENHOUSE RHODODENDRONS are represented at Kew this month by a considerable number of Himalayan species, about half a dozen of the Javanese hybrids, and as many forms of *R. formosum*. The queen of the lot, in regard to size, elegance and purity, is *R. Rucklandii*, of which there are two large plants in full flower in the temperate house, their loose umbels of enormous saucer-shaped, pure white flowers being very handsome, fragrant and durable. A hybrid raised at Kew between this and *R. Hookeri*, and flowered several years ago, is noteworthy on account of its having stood the severe weather of the past winter much better than either parent, and as well as the hardiest of the Himalayan species of this genus. The Javanese kinds are flowering well in the temperate house, where, apparently, they are as much at home as the Camellias,

Acacias and hard-wooded plants generally. The "Andean Rhododendron" (*Befaria glauca*) is also flowering now, and is much more attractive in color and number of flowers in a raceme than it has been before. This dwarf and evidently free-flowering plant ought to become a favorite for the greenhouse. Seedlings take a long time, about ten years, to grow to flowering age, but cuttings or grafts from flowering plants would no doubt bloom when only a year or two old. A hybrid raised many years ago from *R. Dalhousiæ* and *R. formosum* is a very beautiful and free-flowering greenhouse plant. It is not unlike R. Countess of Haddington and *R. Gibsoni* in habit and flower, and it closely resembles the true *R. Dalhousiæ*, a Himalayan species scarcely known in cultivation. The flowers are deeply campanulate, over three inches in diameter, and white tinged with rose. They remain on the plant several weeks.

Epiphyllum Gærtneri.—This plant was introduced into notice by the Belgian nurserymen three years ago under the names of *E. Russellianum*, var. *Gærtneri*, and *E. Makoyanum*. It was at first thought to be a cross between an Epiphyllum and a Phyllocactus, but it has since been shown to be an introduction from Brazil, and is looked upon at Kew as a third species of Epiphyllum, the other two being *E. truncatum*, of which numerous varieties are known in gardens, and *E. Russellianum*. The new one differs from these in having flowers of about twenty lanceolate petals varying in length from half an inch to two inches, and arranged regularly round the cluster of short stamens, so that when fully expanded each flower is in form like a Phyllocactus; the color is a brilliant orange-scarlet. The leaf-like branches are similar in form and arrangement to those of *E. truncatum*, each joint being about two inches long by an inch in width, the margins dentate and the upper end clothed with a brush-like tuft of stiff brown hairs half an inch long. Grafted upon a thin-stemmed Cereus this species forms in a year or so a sturdy standard, with a head a foot through, and it produces two or three flowers on the end of every branch. The plant at Kew has a dozen flowers fully open, and is a beautiful object.

Shortia galacifolia has been exhibited in flower several times this year at plant shows in London. It has proved quite hardy in England, growing freely and retaining its foliage all the winter, in spite of severe frost and poisonous fogs; in spring it sends up numerous flowers, and when at its best it is a really pretty rock plant. The leaves assume a deep, glossy, chocolate color in spring.

The Blue Himalayan Poppy, *Meconopsis Wallichii*, has succumbed to the severe weather of the past winter, although previous winters of the last eight years have not been too much for it. Luckily, we have a batch of young plants which had been placed in a cold frame for the winter, and these are quite safe. At Kew this splendid plant is one of the annual attractions of the rock garden, where it is grown in a damp, somewhat sheltered and shaded position, in a bed of peat. Here it grows well and produces, in July, its tall spikes, a yard or more high, of rich, purplish blue, poppy-like flowers. Seeds are sown every year, and the young plants grown on in pots to take the place of those which die after flowering. This plant is one of the many beautiful garden subjects which come from the high Himalayan Alps, where, in Sikkim, Sir Joseph Hooker found it at an elevation of 10,000 feet. Six other species are found in the same region, three of which are in cultivation at Kew. They are, however, not nearly so useful in the garden as *M. Wallichii*.

Orchids.—The meeting of the Royal Horticultural Society this week was remarkable for the number of rare and beautiful Orchids exhibited, chiefly by Sir Trevor Lawrence, the president of the society, Baron Schrœder and Messrs. F. Sander & Co. The collection of Masdevallias from Burford Lodge was most beautiful, and comprised some very fine varieties of *M. Harryana* and *M. Lindeni* and others. In Baron Schrœder's group there were the following: *Lælia Digbyana Mossiæ*, with two large flowers on a raceme. It will be remembered that when this grand Veitchian hybrid flowered for the first time, two years ago, it bore only one flower. *Cypripedium Morganiæ*, a fine specimen of this most beautiful hybrid, bearing twenty-two fine flowers. Three varieties of *Odontoglossum crispum*, named, respectively, *Stevensii*, *Wolstomholmiæ* and *Veitchianum*, and bearing each a strong raceme of flowers. These are three of the very finest varieties known. *O. hybridum dellense*, *O. Ruckerianum*, *O. Cervantesii moralla*; *Cattleya Laurenciana* and two varieties with a lilac shade in the segments, named *Vinckii* and *concolor*; *Lælia Jonghiana*, *Cymbidium Devonianum* and the hybrid *C. eburneo-Lowianum*. *Masdevallia Lindeni* was represented by a splendid specimen bearing over a hundred flowers. So fine a collection of Orchids has rarely been seen anywhere. Messrs. Sander & Co. sent their new *Dendrobium Venus*, described by me last week; *Maxillaria Sanderiana*, *Scuticaria Hadweni*, *Zygopetalum graminifolium*, with some beautiful Odontoglossums and Cypripediums, several of the latter being new hybrids. These fortnightly meetings in London have grown very much in interest and importance recently. Every plant of anything like special horticultural interest, and which happens to be in flower at the time of the meeting, is sent for exhibition, contributions coming from even the most distant parts of the country. In time the progress in English horticulture will be focused at these meetings of the old Society.

London. *W. Watson.*

Cultural Department.

Earliness in Vegetables.

WHATEVER criticism we may make on the eagerness of buyers for the earliest vegetables, and however philosophically we may ourselves be disposed to wait for the better things that come later, it is of prime importance for the commercial grower to be first in the market with each of his specialties. The best exposure and the warmest soil—often much too warm for later crops—that can be obtained are seized upon, and the competition between gardeners often has the excitement of a game, and success gives an exhilaration out of proportion to the mere money-value of the result.

Usually, the gardener depends upon the seedsman in this matter; but nearly all gardeners of experience and skill have some specialties of which they grow the seeds themselves, and do not let them out of their hands without a liberal *quid pro quo*. In this way originate many of the new sorts put forward in our seedsmen's spring catalogues, and so severely commented upon later by purchasers of little experience. The older heads do not expect many real bonanzas, though they make many tests. It seems to me worth while to ask ourselves what we really have a right to expect of such offerings. Nothing can be more unwise than to condemn them all untested, unless it be to expect a large gain in testing them.

Every old gardener must be aware that our existing varieties of garden vegetables are not only better grown, but better in themselves—in some lines far better, and offer a much wider choice than they did, say thirty or even twenty years ago. Now, how has this advancement been realized? It is safe to say that, while some of it is due to care in cultivation, and a close study of the requirements of each variety, as much or more is due to a quick eye to note valuable variations, and a quick mind to make the most of them. Every crop which we grow exhibits many variations from the designated type, and the best opportunity for success lies in noting those which indicate special value.

Though variation is constantly showing itself, it appears more frequently as the distance widens between the locality where a variety originated and that where its cultivation is attempted. It often happens that such variation may seem to make a variety utterly worthless in its new location. This was the case in an attempt made, not long ago, to grow a northern variety of Sweet Corn in the south. There was an almost entire failure; but, by successive replanting from the southern-grown seed, not only was the type re-established by spontaneous adaptation, but it was absolutely improved.

In my own experience, extending over twenty-five years in northern Vermont, I have reached the conclusion that a variety of early peas, or beans, or corn, can be made to order in a longer or shorter time, according to the complexity of the requirements imposed. When a variety begins to sport—and they all do it—by successive plantings they may be made to fly, so to speak, in all directions, and then we have only to select and fix the form that suits us. From a single bean sport I have grown hundreds of varieties, which could have been increased to thousands before a tendency toward fixity again showed itself. In these varieties were seen almost every form of plant, of seed, and of markings; but it was not until the fourth generation that the original type reappeared, even approximately. In peas, I have actually produced, by crossing and selection, a predetermined variety with a special characteristic previously unknown. In the same way I have, by crossing, produced a sweet corn having all the characters of the Black Mexican (but much earlier), without the least aid from the latter.

It is easy to see from this how easy it may be, in a proper location, to obtain and measurably fix a habit of early maturity

in any garden vegetable capable of being successfully grown there at all. But when the desired thing is produced, it is to a great extent the child of its environment, capable, with care, of perpetuation in that specific locality, but with no sure promise that it will live up to its home character when removed to a considerable distance. I believe that no variety of corn will continue the same if moved in latitude more than fifty miles; and where it is a question of altitude as well as latitude, it will prove itself quite unstable under changes of a very few hundred feet.

This subject is one that seems to be worthy of careful attention. If properly studied, I am confident that very surprising results will be reached, and certain principles established, which will not only remove all mystery, but will give us mastery where before we trusted to chance.

Newport, Vt. *T. H. Hoskins.*

Fig. 38.—The Douglas Fir.—See page 205.

The Egg-plant and its Cultivation.

A LATE bulletin from the Cornell Experiment Station gives some interesting experiences with the Egg-plant, and from it we make the following extracts :

The chief difficulty in growing the Egg-plant in the north is the shortness of the seasons. It is only by starting plants early and maintaining a vigorous growth that we can succeed in fruiting the large sorts satisfactorily. The plants should be started under glass from the middle of March to the middle of April in a warm house. In the cold and small house used in our early tests the plants grew slowly, and when set out-of-doors they were not of sufficient size and vigor to begin bearing at once. We sow in "flats" or boxes, and when the first true leaves are about a half inch in diameter—which is about a month after the seed is sown—the plants are pricked off into two-inch pots. As soon as the pots are filled with roots the plants are shifted into four-inch pots. We have had indifferent success in transplanting into other flats, as the plant is more severely checked when placed in the field from the greater injury to the roots. It is imperative that the plants should not become "drawn." The plants are transferred from the four-inch pots to the garden from the first to the middle of June. The early sorts, as Early Dwarf Purple, are not so seriously injured by a check in growth as the large and late sorts, and they can therefore be handled with less care. These sorts can be started two weeks later than the others and receive but one transplanting. The effects of early and late setting are shown in the following experiment :

Seeds of several varieties were sown March 27th and May 15th. On the 7th of September they presented the following differences : Long Purple, Giant Round Purple and Long White from early sowing were productive, but few or no fruits had formed on the plants from late sowing. Early Long Purple and Round White from the late sowing were fully as productive as those from the early sowing. Early Dwarf Purple gave best results from plants started April 15th. This shows that there is little or no gain in productiveness in the small early sorts from very early sowing, while the large sorts profit by it. The Black Pekin, which is one of the large varieties, proved an apparent exception, however. Plants started May 1st gave better results than those started earlier, but neither lot was satisfactory. The unsatisfactory results from the early sowing may have been due to the loss of the first flowers because of the transplanting. Transplanting usually has the effect of keeping plants growing to the detriment of the flowers ; and Egg-plants which are in bloom when removed to the field are apt to drop the flowers. It is important in the large sorts to induce the first flowers to set.

The best soil for Egg-plants is a rich sandy loam—not too light—which contains an abundance of humus and retains moisture. Manure heavily. Large kinds should be set three feet apart each way. The ground should be thoroughly cultivated throughout the season. We run lightly through the land with the cultivator twice a week. The worst enemy of the Egg-plant is the Potato-beetle, which prefers Egg-plants to Potatoes. The Egg-plant grows slowly, and any injury to the young plant is with difficulty overcome. If the plants are seriously injured when first set there will be little use in attempting to fruit the large kinds. Paris green, at the rate of one pound to one hundred gallons of water, is destructive to the beetle. Very rarely do plants in a large plantation of the late varieties all mature fruit, and such kinds as Black Pekin, New York and Giant Round Purple rarely mature more than two large fruits to the plant in this latitude, and often only one. Some of the early and medium varieties mature from four to eight fruits. The value of any late variety depends largely on the uniformity with which all the plants set and mature fruit. The New York Improved possess this advantage over the old New York Purple. The value of long and careful selection to this end was illustrated in our large plantation of crosses last year. A large percentage of the plants were entirely unfruitful, showing that a promiscuous lot of seedlings is likely to be unproductive, and in this case these seedlings were crosses between productive parents. Breeding plants of uniform productiveness is the most important field in experiments with the Egg-plant now.

The varieties are not numerous, and vary widely in habit, pubescence, spininess, color of plant and fruit, size, shape and season of fruit. The larger varieties are most popular in market, but some of the earlier and smaller kinds are better. The white varieties find little demand in the market, and there is an impression that they are unwholesome, but they possess no other fault than a hardness of flesh and rind in the case of the smaller varieties. The White Chinese is as good as any for table use.

Besides a record of experiments in crossing different varieties, the bulletin contains an interesting study of the botany of the plant, by Professor Bailey. A summary of the bulletin is given as follows :

1. Egg-plants are adapted to cultivation in the north. The requisites of success in growing them are these : early starting ; warm quarters ; vigorous plants ; rather late transplanting to the field ; warm, rich and rather moist soil ; constant attention to Potato-beetles ; frequent cultivation.

2. The best varieties for private use are Early Dwarf Purple, Early Long Purple, White Chinese, with perhaps Black Pekin for late.

3. The best market varieties are New York Improved and Black Pekin, with perhaps Early Long Purple for the first demands.

4. In crossing different races of Egg-plants, the purple-fruited types appear to be stronger in their power to transmit color to offspring than do the white-fruited types ; and this appears to hold whether the purple type is used as the staminate or the pistillate parent.

5. The white-fruited types appear stronger in the power to transmit form and productiveness.

6. Fewer seeds are produced by flowers artificially pollinated than by those left to mature, even though an excess of pollen is used.

7. It is probable that the Egg-plant may be included among those plants which are capable of producing fruit without the aid of pollen.

Garden Annuals.

HOWEVER valuable perennial plants may be, some, like the Oriental Poppy, die down early and leave a gap, while others do not make much show until late in the season, and it is just here that the annual plants help out and contribute their share toward the summer display. A garden planted with perennials will still have room for patches of Mignonette, a group of China Asters, various in color or all alike, as the fancy is, or some Helichrysums, which, if cut when fully open and before they are discolored by the rain, will keep bright until more may be cut next season. One who tries to grow all the good perennials will still have room for all the good annuals ; and a model flower-border is one that combines the best of both classes with hardy bulbous plants.

. Our Narcissus are of necessity planted in a wide border in rows eighteen inches apart, and between the rows will be planted later on a quantity of Asters of various kinds for cutting ; this will save despoiling the flower-garden proper, for although Asters make a brave show while they are in flower, a heavy rain gives them a sorry and bedraggled look, and they should never be employed except in a secondary place, where they will aid in forming a display. Zinnias are entirely different, and may be used alone or dotted about in groups among other plants, because they blossom continually until frost, are not hurt by rain, and are excellent for cutting. In these three respects they excel the old bedding Geranium. In a wide border, or in any place where it is customary to plant the Geranium, Zinnias will answer the purpose admirably, and one has not to provide room for them all winter. In sowing Zinnias it is best to get separate colors, as in the mixed seed there are so many displeasing shades. Good colors and true to name can now be obtained, and if you want the "finest mixed" buy the colors you like and make your own. The same remark applies to Stocks.

Another annual plant, not half so well known as it should be, is the "Yellow Corn Flower," *Centaurea suaveolens*. In shape it is similar to the blue one, differing only in color, which is bright yellow. As the flowers are borne on long stems they have already attracted the attention of florists for winter cutting. The plant succeeds well when sowed in the open ground in May.

The Marguerite Carnation is one of the most valuable of recent introductions for those who cannot grow the ordinary florist Pinks, for, in a comparatively short time, good strong plants can be raised from seed and flowered, and it is surprising how really good the flowers are. The percentage of single flowers is very small. A florist of my acquaintance planted a lot of these on his benches last fall, with other pinks, and they gave an immense crop, many of them being beautiful in color, and all were fragrant. After a little more careful selection this Carnation will be an indispensable garden plant.

Sweet Peas should be sown by this time, and wherever they may be planted provision should be made for watering in dry weather, or failure is certain. Last summer six weeks of dry weather deprived us of these flowers, and this season we took

the precaution to dig a trench eighteen inches deep and place plenty of manure at the bottom, filling in the soil and sowing the seeds. In hot dry weather the rows will also be mulched and watered, and in this way a constant supply will be maintained. Do not buy mixed seed.

Mignonette is so much liked, and there are so many sorts offered, that one does not know which to sow out in the open ground. While all may be good in-doors, few will stand our hot sun and dry weather. We have found Machet the best; it produces good stout spikes of fragrant flowers until the fall.

Nasturtiums are often planted in rich soil. This is a mistake, for very few flowers are then produced; but when sown in poor soil they will flower abundantly. The same rule holds with *Salvia splendens*, now often treated as an annual. The Poppies, of which there are so many kinds, are very showy. They do not last long, but if cut when about to open they will last several days, and are useful for large vases for room decoration.

South Lancaster, Mass. *E. O. Orpet.*

Odontoglossum Œrstedii.

THIS small compact species is nearly always sure to be found in flower during the early months of spring, and although its blooms do not equal in size those of many other Odontoglossums, nor are they borne in such profusion, nevertheless they possess a charm peculiarly their own. The pseudo-bulbs are small—about the size of a pigeon's egg when fully developed—ovoid, more or less compressed, and furnished at the summit with a solitary oblong-elliptic leaf from three to five inches long, the lower portion being narrowed somewhat abruptly into a petiole. About two or three flowers are generally borne on the scapes, which spring from the base of the ripened pseudo-bulbs. Each flower is from one to one and a half inches across, and pure white with the exception of the bright yellow callus, which is more or less densely covered with deep orange spots. The sepals are rather broader than the petals, and are bluntly oblong with apiculate tips; the spreading petals are somewhat similar in shape, but are contracted at the base, while the roundish or wedge-shaped lip is more or less cut in the centre.

Messrs. Veitch & Sons, of Chelsea, were the first to flower *O. Œrstedii* in England in 1873, a year after its actual introduction to cultivation through the collector Endres. The knowledge of this species, however, dates as far back as 1848, when it was discovered by Warscewicz in moist situations in Costa Rica at the height of 7,000 to 9,000 feet above the sea-level. It was afterward found by Dr. Œrsted (whose name it bears), Endres and Wendland, the latter, it might be remarked, being now the sole survivor and director of the gardens at Herrenhausen, Germany. It is possible that the first plants introduced were somewhat sickly or did not produce flowers of much merit, for, although shown on several occasions since the time of its first flowering, it was not until March, 1884, that this plant received a first-class certificate from the Royal Horticultural Society, the specimen on this occasion having been grown in the then famous, but now obsolete, collection of Mr. William Lee, of Downside, Letherhead.

Growing at a high altitude in its native country, *O. Œrstedii*, naturally requires only a moderate amount of heat under cultivation. It is found to thrive best in well-drained shallow pans in a light compost of peat and sphagnum. The pans should be suspended near the glass, so that the plants may obtain the greatest possible amount of light, without, however, subjecting them to the very hot rays of the sun. Watering is regulated according to the condition of growth, more frequent supplies being given when the young bulbs are rapidly increasing in vigor, and a gradual diminution, with plenty of air, as they are becoming mature and ready to produce their flower-scapes. The temperature may be fifty to fifty-five degrees Fahrenheit in winter, gradually rising to sixty or sixty-five degrees during the summer.

Isleworth, London, W. *J. Weathers.*

Iris Caucasica came into bloom about the middle of April. This is one of the hardy bulbous (*Xiphion*) Irises of the Juno section, and should probably be grown in rather stiff soil. The habit is very peculiar and distinct. The plant is dwarf, leaves short, pointed, shiny above, with a slight, thin, white line on margin. The leaves are distichous, *i. e.*, arranged in two perpendicular rows. The flowers are small, and appear in succession from the axils of the upper leaves. They have a very quiet beauty, being of a translucent greenish yellow, with a distinct crest on the claw and blade.

Scilla trifolia is a distinct but not very showy Squill, which was in flower in April. The three leaves are lance-shaped, slightly glaucous, and rather thinner in texture than is usual in the family. The flowers are individually small and borne in pyramidal raceme on short scapes. In color they are light blue, of a pleasing shade. They are natives of Asia Minor, and excellent subjects for the rockery.

Phlox subulata Sadie.—This is a plant to be made a note of now that it is in bloom. It is apparently a cross between *P. subulata* and *P. stellaria*, showing many of the characteristics of the latter, with the compact growth of the former. The flowers are large and white, with a very slight lavender tint. As grown in a large mass at Myer's nursery, where I saw it coming into bloom a few days since, it was very effective, and seemed a valuable variety for an early spring border.

Begonia Triomphe de Lemoine, the flowers of which have been illustrated in Garden and Forest (vol. ii., p. 557), proves to be a very distinct variety of this interesting family. The plant has not proved of very attractive habit in the greenhouse, but this may be a fault of cultivation, as the stock was secured too late to cultivate out-of-doors in summer, as advised by the raiser. The leaves are round and peltate, the stems herbaceous. The influence of the Socotrana parentage is quite pronounced in these, as well as in the flowers, which are the most persistent of any Begonia yet introduced. I am not prepared to say exactly how long they remain on the plants, but some clusters of flowers which appeared in the winter still seem to be undiminished. The flowers individually are not specially attractive or large, but they are of a good pure dark red and very abundant. Plants of this variety should be secured now and grown in the open air during summer, so that they will be strong for their winter work. *Begonia Socotrana* seems to be the missing link between the fibrous and tuberous-rooted sections, making crosses with either. None of the fibrous-rooted hybrids as yet have the large showy flowers of the tuberous crosses, but in some respects they are more desirable for general cultivation, as they do not have such a distinct period of rest and are always in evidence. The deciduous section are easily lost if care is not taken of the bulbs, and there is always more or less care required to dry them off properly and start again at proper season.

Begonia Louis Closson.—Among the Rex Begonias, Louis Chrétian has long held first place as the brightest and most effective, but it is very probable that this new variety will at least equal the older one, if not surpass it, in popular favor. The leaves of Louis Closson are broadly margined and centred with a lustrous pure black, and the zone is a rich satiny deep wine-red, a very quiet, rich and effective combination.

Elizabeth, N. J. *J. N. G.*

Correspondence.

Botanical Nomenclature.

To the Editor of Garden and Forest:

Sir,—The discussion in regard to the establishment of a stable botanical nomenclature has a special interest to me from the fact that, in a short time, I propose to have published from this division a check list of the arborescent flora of the United States, containing both botanical and vulgar names; and, while Mr. Sudworth is working out the botanical synonymy, it will fall to me to decide muted points.

I should like, therefore, to see all such points discussed fully, in order to arrive at what the consensus of opinion is, and to render our work of revision as stable as possible.

Dr. Britton suggests that we follow the practice of the ornithologists in not citing the author of a new combination of specific and generic names. I think this would be a mistake, and, while we may admire the modesty and the deference to artistic sense on the part of the ornithologists (inasmuch as the names of one or two authors who made the revision would appear endlessly repeated), we have no such reasons in the botanical nomenclature for abandoning historical accuracy.

The practice of adding the author's name to the plant name serves, first of all, the valuable purpose of identifying the plant to which the name is given; it is the mark of identity. Thus, by writing *Tilia Americana*, L., we want to insure that we call up the plant which Linnæus described and named, and not, perhaps, the plant which Walter described under the same name.

Next comes the historical relation which the citation of an author at once brings before the student. We are informed that Linnæus knew the genus Tilia and the species Ameri-

cana as such, and can find in his writings a description under that name. Last, though in the minds of many this seems the foremost use of the citation, the personal consideration comes in of giving credit to the discoverer, the describer, the namer of the plant.

Making priority of name the criterion for its use, I take it, is not to glorify the namer and give him due credit, but to find some basis upon which to establish order out of chaos.

The notation, by which we write *Hicoria minima* (Marsh.), Britton, answers admirably all the requirements of ready reference, historical accuracy and personal responsibility. None other will suffice; none better, I think, can be proposed. Leaving out "Britton" at once introduces a factor of error or doubt as to what plant really is meant, for Marshall never described any plant under that name, and we could not identify it by reference to his publications unless we guessed that his Carya corresponded to Hicoria; furthermore, it would be misleading historically, for in his time, or by him, Hicoria was not known as equivalent to Carya, and even personal responsibility would be misplaced, for he was not the author of the name as it stands, but only of a part of it.

On the other hand, if we write Catalpa Catalpa (L.), Sudworth, we know at once this is a plant which bears its name by virtue of a revision made by Sudworth, and somewhere I may find the history of that revision and the relation of this name to other names. It shortens the road, moreover, by giving me the historical information that Linnæus used the specific name Catalpa, but did not place it in the genus Catalpa; hence, if I know that the genus Catalpa and Bignonia have been differentiated, I can at once identify Bignonia Catalpa of Linnaeus as the plant here meant, and identification, historical truth and proper reference, the three objects of citation, have been attained.

Let us for once agree as to what thing we mean to call by a given name, and it will be possible by and by to drop the author of the name entirely, just as in common life, when we speak of a billiard-table it is not necessary to add, "I mean that which So and So first called billiard-table." This time, however, is not near at hand, except perhaps with some well-established, unmistakable species, and, therefore, we shall have need, for the sake of accuracy, to continue citing authors. But by all means let us have them cited fully and accurately, or else the value of the citation is illusionary.

Forestry Division, Department of Agriculture, Washington. *B. E. Fernow.*

April Flowers in Northern California.

To the Editor of Garden and Forest:

Sir,—The middle of April, in California, north of San Francisco Bay, finds the wild flowers, in hundreds of species, and often in vast quantities, covering acres on acres of ground. As yet the height of the season is not reached. The San Joaquin Valley and Monterey are fully three weeks earlier, and southern California earlier still. A month ago our common Buttercups, *Ranunculus macranthus*, were few in numbers; now the roadsides are yellow with them, and pastures are covered with them by the acre. In wet places *R. Bloomeri* takes its place with equal profusion. Yellow seems a favorite color here, for it is always seen in masses. In places a low-growing Œnothera, in profuse flower, shows the richest of yellows for a long period. Then the Eschscholtzia fairly monopolizes some vacant lots in this town where there is a deep gravelly soil. These beautiful Poppies appear, not in dozens or thousands, but turn whole acres into billowy masses of splendid orange; other acres glow with the darker orange of Amsinckia or the purple-blue of Lupines. The Eschscholtzia foliage is especially rich this season in scarlets and bronzes, which, if they could be relied upon as permanent, would make it an interesting foliage plant.

Nemophilas are largely used by nature as bedding plants here. *N. insignis*, Blue Eyes we call it, is everywhere in single plants or in beds, a few yards in extent, and occasionally by the solid acre. *Gilia tricolor* is another plant which now covers entire hillsides. *Platystemon Californica*, another member of the Poppy family, is also a favorite with nature. The flowers are a creamy yellow, borne separately on long stalks. In dry fields it covers large areas. White is the rarest color in these natural parks. Several species of Eritrichium are here, with delicate, white flowers. *Limnanthes Douglasii*, long in cultivation, forms large, white masses in moist places. Scarlet does not yet appear in abundance, although *Calandrinia Menziesii*, another cultivated species, is everywhere.

Mendocino County and the region around the base of Mount Shasta have the richest flora in California. The Sierra Nevada range is largely volcanic. In the coast range clays prevail, with here and there volcanic projections. At Shasta these two ranges meet, giving in a small space great variations in soil, altitude, exposure and moisture. The rainiest spot in California is closely adjacent to a lava desert, so at Mount Shasta the conifers have a wonderful development in species, and the flora as a whole is very rich. In Mendocino County the Redwood-forest furnishes shade and moisture. The dry Chemisal region is close at hand, giving the prevalent flora of the coast range. Elevations of 5,000 to 6,000 feet give alpine conditions, while isolated volcanic points add variety to soil. Add to this narrow valleys and deep cañons, and the variety of vegetation is not to be wondered at.

Among shrubs the various Ceanothus are common, going far to make up the unbroken growth, from six to fifteen feet high, which, in an almost impenetrable thicket, clothes many of the mountain-sides of the coast range, and gives them a smooth, Heath-like appearance. The local name for this low growth is chemisal when the shrub *Adenostoma fasciculatis* predominates; chapparal, if the growth is largely mixed. In the aggregate vast areas are so covered. One continuous belt is sixty miles long by eight or ten wide, with very small breaks in timber or grazing-land. *Ceanothus divaricatus* is one of the commonest elements of chapparal, and is now in bloom. In the open Redwood *C. thyrsiflorus*, a fine shrub, often fifteen feet high, with flowers much like a lilac, and fully as beautiful, covers large areas in an almost impenetrable thicket.

In my garden *Erythronium grandiflorum* is beginning to fade. It gave fine satisfaction this season, planted in chip mold, and rather shallow. *E. giganteum*, from Oregon, bloomed for the first time this year. The bulbs were strong and produced large blossoms, four to six to each, and several three inches across. Close observation shows some difference between this and *E. grandiflorum*, but the distinction is not well enough defined to be satisfactory. The yellow of the flowers of *E. giganteum* has a slight greenish shade, while those of *E. grandiflorum* shade from light straw at tips to rich yellow near the centre, and occasionally with markings from light brown to very dark. *E. Smithii* lacks the elegance of form of the two former, and is one-flowered. Its color, at first, is white, with a pink tinge, and becomes pink-purple. *E. Howellii* has a straw-colored flower with a peculiar pinkish orange centre. With me it was quite small, but the bulbs may not have been strong.

Brodiæa multiflora and *B. congesta* blossomed together, and very beautiful they were. They were planted in shallow boxes, the top soil mold and clay with a light dressing of sand. The first Calochortus to flower was the dainty little *C. cæruleus*. It was closely followed by *C. lilacinus*. The first is doing well in a common clay loam. *Fritillaria lanceolata* seems to run to many forms, which, to the gardener, would be good varieties. The prettiest I had this year was a light yellow one. They were in shallow boxes about three inches deep, in clay loam, and shaded in the afternoon. Considering the quality of the bulb the flowers were as good as I have seen in the very best natural wild growth. There is a variety of *F. recurva* which is unusually fine. Some racemes were sent to me with five to nine blossoms, and I have heard of one with eighteen.

Ukiah, Cal. *Carl Purdy.*

Washington in April.

To the Editor of Garden and Forest:

Sir,—No city can be more beautiful than Washington is in the latter part of April, with mile upon mile of flourishing trees of all varieties in their fresh young foliage. These border the streets and avenues and stand guard over the wide parking of emerald turf spread out before each residence. The fronts of many houses are at present one mass of long violet clusters of Wistaria, or almost covered with the brilliant green of Honeysuckle or the half-open leaves of the Virginia Creeper, or its next of kin, the Japan Ampelopsis.

The public parks have burst into bloom and beauty in the most marvelous manner within a few days. Great clumps of white and purple Lilacs, pink sprays of Flowering Almond and Tamarix, snowy blooms of many sorts of Spirea (although the latter are not doing their best this year), Snowballs just ready to "turn white in a single night," occasional small groups of Blood Maples, Purple Plums and Golden Barberries, with the silver bells of the Halesia and the flame of Japan Quince blossoms against the rich satiny turf, make a wealth

of bright color even under the soft sunshine and the opal haze of spring.

The attractive features of this locality are not confined to the city limits, however. Yesterday a drive of a few miles up the Potomac brought me to Glen Echo, where, on the river's bank, the new and permanent home of the Chautauquans has been selected.

The woods abound with Dogwoods and Redbuds, and they are now in their glory. The bright blossoms among the sombre Cedars and Pines, and the rapidly bursting foliage of the Chestnuts, Elms, Oaks, Poplars, Beeches, with their varying tints and shades, make the prospect one dream of beauty.

The carpeting of these groves, which has long been flecked with the Trailing Arbutus, the milky Bloodroots and pale pink and blue Liverworts, is now ornamented with clumps of Saxifrage, Spring Beauties and graceful Wind-flowers, with here and there a patch of Bluets, Buttercups and Violets. Besides these are Adders'-tongues or Dog's-tooth Violets, some bunches of the early Daisy, with its broad golden eye and fine lavender lashes, sometimes, I think, called Robin's Plantain, and graceful stems of Solomon's Seal almost in bloom. Farther down the slopes are snowy stretches of the great starry Chickweed, and near the water the stiff Jack-in-the-pulpit, the odd umbrella-leaved May Apples and uncurling fronds of many Ferns are running riot. Around the base of the rocks, many of the crevices of which are adorned with clumps of wild Columbine, are tufts of Everlasting, wild Pinks (*Silene Pennsylvanica*) and the pretty-leaved Lousewort. There is an occasional breath from the Swamp Magnolia, and the warm pink Azaleas are just beginning to bloom among the Huckleberries on the hill-side. Near the river grows the purple Lady's-slipper, with its rosette of light green leaves, amid a great wealth of the Lungwort, with its smooth, tender foliage, graceful stems and loosely flowered racemes of dainty purplish pink buds the size of a pin-head, with the full, open trumpets of the developed flower, a delicate clear blue. Surely, Glen Echo is worth a visit.

Washington, D. C. *M. Fuller.*

Orchids at Whitinsville.

To the Editor of Garden and Forest:

Sir,—In the conservatories of Mrs. J. W. Lasell, at Whitinsville, Massachusetts, I recently saw a plant of *Cymbidium Lowianum* with eleven spikes, and nineteen flowers on some of the spikes. The flowers of this plant had more of the golden yellow tinge than is generally seen, while the lip was a rich dark brown.

A superb specimen of *Cattleya amethystoglossa* had a spike with twenty-three flowers. Fortunately, this remarkable plant has been photographed. In other Cattleyas this collection is remarkably rich, having good specimens of all the choice species and varieties.

Among Cypripediums are many fine plants of Spicerianum, Lawrencianum, Sanderianum and others, some forty varieties in all. Mr. McWilliam, under whose care those fine plants flourish, has a great many seedling hybrids which are yet too small to flower. Notable among the large collection of Dendrobiums here, is a specimen of *D. formosum giganteum*, which made a twenty-nine-inch growth last season, producing twelve large well-developed flowers. The English horticultural journals complain that this plant does not succeed well there. Mr. McWilliam grows it in a much lower temperature than it is said to have in England, and gives it a three months' rest after flowering at a temperature of forty-five degrees. *Cœlogyne cristata* was almost past, but had been a mass of flowers for three months. Twenty-six ten-inch pans produced from thirty to fifty-four spikes each.

Disa grandiflora flowers here every summer, with Lælias in variety, and many Lycastes, Masdevallias, Oncidiums, Phalænopses, Saccolabiums, Vandas and Zygopetalums. Of Odontoglossums there are more than two hundred plants of choice varieties, *O. vexillarium* being particularly well done. One plant last season had thirteen spikes.

Calanthes were a show of themselves for about three months, a hundred plants being in flower at once last year.

Peristeria elata, the Holy Ghost Plant, is well grown here, as those will testify who saw the remarkable plant at the exhibition in Boston last August. This plant had twelve spikes, and one of them bore seventeen expanded flowers, with as many more to open.

Apart from Orchids, there is much here to interest intelligent lovers of plants, not only in the way of rare and choice specimens, but in the admirable growth of all kinds of plants, which is the test of a good gardener.

Whitinsville, Mass. *W. S.*

Recent Publications.

Floriculture as an industry has never been made the subject of census investigation until now, and, therefore, the preliminary report which has just come to this office has exceptional interest. The business has been carried on, of course, for more than a hundred years in the country, and yet the statistics show that it has only assumed large proportions during the last quarter of a century. Out of nearly 5,000 establishments, three-fifths have been started since 1870 and one-third of them since 1880. At the beginning of the century there was but one commercial florist in the country, and only three establishments were started between 1810 and 1820. Eighty per cent. of the entire business has been developed during the past twenty-five years. During the census year every state and territory, except Idaho, Nevada, the Indian Territory and Oklahama, reported some business in floriculture, and, perhaps, in these states small establishments would have been discovered if sufficiently thorough investigation could have been made.

The report makes record of 4,659 establishments, of which 312 were owned and conducted by women. These establishments had in use 38,823,247 square feet of glass, covering a space of more than 891 acres. Their value, including fixtures and heating apparatus, was $38,355,722, and the tools used were valued at $1,587,690 more. Wages amounting to $8,483,600 were paid to 16,847 men and 1,958 women. The fuel cost more than $1,000,000, and the postage on the 20,000,000 catalogues amounted to $767,438. In addition to this, more than $1,000,000 were paid for advertising, and another $1,000,000 for freight and express bills. The receipts from cut flowers amounted to more than $14,000,000, and from plants and shrubs more than $12,000,000. The largest area in glass in a single establishment was found in the District of Columbia, and the smallest in a New England farm-house, from which the lady of the house sells annually from $35 to $50 worth of plants and flowers, raised under sixty square feet of glass. Besides the Society of American Florists there are 965 state and local societies and clubs, and 358 horticultural societies, and these, aided by the agricultural and horticultural press, have helped to put the industry in its present healthy and prosperous condition, giving employment to thousands of people, and furnishing a fair reward for capital invested, besides doing much to adorn the homes and elevate the taste of people of all classes.

It is difficult to estimate the rate of wages paid, because many of the greenhouses are small—that is, having a glass area of from 300 to 1,500 square feet—and in them there is no outside labor employed, since the owner or some member of his family does all the work, often in connection with market gardening or a small nursery-trade, and some of the smaller establishments are conducted by women or persons who are invalids and who are not able or do not care to work all the time. In many of the larger establishments during the busy seasons numbers of extra men are employed, and this makes an additional difficulty in the estimate. The figures seem to show, however, that the wages paid in what is called the North Atlantic division of the United States are rather more than $1.50 a day to men, and rather less than a dollar a day to women, although in every establishment of any size there are men acting as experts, or as foremen, who receive from $15 to $20 a week. In the southern states lower wages are paid, and higher pay is commanded in the Pacific states.

Of the plants sold the demand in the northern and eastern states is greatest for the following in nearly the order named: Geraniums, Coleus, Roses, Pansies, Verbenas, Heliotropes, Carnations, Chrysanthemums, Palms, Ferns and Fuchsias. In the south the demand is for Roses first, and then for Chrysanthemums, Geraniums, Coleus, Palms and Ferns, while California shows the demand to be largest for Roses, Carnations, Chrysanthemums, Geraniums, Palms and Pansies. There is also a very general and growing demand for aquatic plants, and specialists are giving marked attention to this branch of the business. Regarding cut-flower sales, reports show that, while there is a slight variation in the demands of the different markets, the greatest demand everywhere is for Roses, followed closely by Carnations. These two furnish about sixty-five per cent. in value of all cut flowers sold. Violets, Chrysanthemums, Lilies, Hyacinths, Smilax, Bouvardias, Heliotrope, Pansies and Tulips, in the order named, supply twenty-five per cent. more, while the other ten per cent. is made up of Orchids, Tuberoses, Mignonette, Primroses, Camellias, Daffodils, and many others cultivated in a small way to supply a special or local demand. As to the profits in the business from the different classes of plants, eighty per cent. of the re-

ports mention Roses as most profitable, Carnations second and Violets third, while twenty per cent. rank Carnations first, Roses second and Violets third.

Notes.

Mr. Jacob Austin, of Fergus Falls, Minnesota, who has done much to encourage tree-planting on the borders of the prairie, has been exhibiting a fine lot of maple-sugar made from trees of his own planting.

"Reader," who wishes to know whether the Rose Baroness Rothschild is correctly described in a leading trade catalogue as "delightfully perfumed," is informed that the Rose in question has no fragrance.

Lilies-of-the-valley have recently been grown in England in large pyramids formed of a light, wooden, lattice-work filled with moss, the bulbs being set about an inch apart, and the plants, when fully developed, forming a solid mass of leaves and flowers.

For the past week the Weeping Japanese Cherry has been an object of striking beauty. These trees grow very rapidly, and soon become twelve or fifteen feet high, with branches which droop to the ground in a circle of as many feet in diameter, and covered completely with light pink blossoms.

Rarely do we see Peach-trees, Cherry-trees, Plum-trees and Apple-trees all in bloom at once, but this is what has happened this year in this neighborhood owing to the sudden coming of warm sunshine. Singularly enough, hereabouts, the blossoms of the Cherry-trees opened before those of the Peach-trees. What was the occasion of this change in the order of the floral procession ?

In a paper on cultivating Carnations, read before the Philadelphia Florist Club, Mr. A. M. Herr gave the following list of varieties as the best market sorts with him, on sandy loam that does not readily become water-clogged: For white, Lizzie McGowan, Mrs. Fisher, L. L. Lamborn and Silver Spray; for pink, Grace Wilder, Christmas, Fred Creighton and Day Break; for scarlet, Hector only; for crimson, Anna Webb; for carmine there is nothing to compare with Tidal Wave. Buttercup is the best of its color, but it cannot be grown successfully by Mr. Herr, and therefore he substitutes for it Golden Gate. For fancy, J. J. Harrison, Nellie Lewis and Chester Pride have proved the best.

It is asserted in a German horticultural journal that two valuable novelties, *Iris Danfordiæ* and *Heuchera sanguinea*, have proved entirely hardy in Silesia during two severe winters. The former, which was procured by Herr Max Leichtlin from the banks of the Euphrates, perished the first winter that the writer attempted to grow it, when it was protected with planks and leaves. But this year, when it was left entirely unprotected, it survived and came bravely into bloom with the Snowdrops. An old plant of *Heuchera sanguinea*, which is a native of Arizona and northern Mexico, was also left uncovered and likewise survived, while seedlings of 1889 did as well under a slight covering.

A Hyacinth exhibition was recently held at Charlottenburg, near Berlin, for the purpose of proving that German horticulturists and amateurs need not feel dependent upon Holland for their supply of these plants. Twenty thousand blooming plants were exhibited by eleven growers of the immediate vicinity, and the display is said to have been very fine despite the unfavorable weather of the winter just past. A writer in *Gartenflora* declares that, although much greater areas are devoted to Hyacinth culture in Holland than in Prussia, and although the varieties there produced are more numerous, the Berlin flowers now equal the Dutch as regards purity of strain, good general development, prolific blooming, and the beauty of individual flowers.

In response to a request for a list of varieties to restore a run-down fruit-garden, Mr. J. J. Thomas names the following, which are hardy and productive, and as they are for home use good quality has been considered of the first importance. Apples, for succession: Early Harvest, Yellow Transparent, Sweet Bough, Primate, Autumn Strawberry, Gravenstein, Fameuse, Hubbardston, Wagener, R. I. Greening, Jonathan, Red Canada. Pears: Summer Doyenné, Giffard, Tyson, Bartlett, Howell, Anjou, Lawrence, Malines. Peaches: Early Rivers, Mountain Rose, Large Early York, Crawford, Nivette, Richmond, Stump, Salway and many others. Plums: Bradshaw, Imperial Gage, McLaughlin, Jefferson, Lawrence Gage, Bavay. Cherries: Coe's Transparent, Rockport, Black Tartarian, Windsor, Early Richmond, Large Morello. These are only a few; there are other sorts nearly as good, and which may be substituted when a change in locality requires, or where personal preferences would make additions.

In an article on "The Republic of Uruguay," by Mr. Theodore Child, published in the May number of *Harper's Magazine*, there is a description of the Central Cemetery of Montevideo which shows that the Campo Santo of the south of Europe has perpetuated itself in South America. This cemetery, we are told, "is considered one of the sights of the capital. It has a monumental entrance and an elaborate chapel, and is reputed to be the most luxuriously and best-arranged cemetery in South America. It is situated on the sea-shore and divided into three sections, surrounded by high walls, in which are arranged, on the inside, innumerable niches, each with its marble tablet recording the names of those whose remains are deposited inside. The coffins are wound up to the mouth of these mural cellules by means of a portable lift and ladder combined, and the whole surface of the walls is hung with wreaths of fresh flowers or of beads, which stand out in strong relief against the marble facings. Each section of the cemetery is carefully laid out, fenced in with iron railings, and full of tombs and monuments of great price and pretensions, due to the chisels of the sculptors of Rome and Milan. The vegetation in the cemetery is most varied, and, besides the funereal Cypresses, there are flowering shrubs of many kinds, and on almost every grave wreaths of fresh flowers, constantly renewed, that fill the air with their perfume. The pious luxury displayed in this Campo Santo is remarkable."

The name of Baron Haussmann, who recently died in Paris at the age of eighty-two years, is probably better known than that of any of his contemporaries whose public services were of a purely pacific kind. Appointed Prefect of the Seine in 1853, soon after Napoleon III. placed himself on the throne, he was busied until the fall of the Empire in improving the city of Paris. Not unnaturally, he was severely criticised for many of the changes he wrought in sweeping away the old narrow filthy streets and opening wide, straight thoroughfares in their stead, for the historic interest of Paris was thus greatly decreased and many buildings of architectural as well as historic importance were swept away. But those who believe that the first purpose of cities is to afford comfortable and wholesome places of habitation rather than to be museums for the delectation of travelers, cannot but look with admiration on the results of his work, which have made of Paris the most stately and splendid of modern towns. Nor were his services confined to the cutting of new boulevards and the transforming of whole regions like the Batignolles Quarter from tangles of dirty alleys, inhabited by the most wretched poor, into spacious, airy and healthful districts. He carefully arranged for the planting of avenues and small squares, was the first to propose the improvement of the Bois de Boulogne and the Parc Monceau, and established the Parc des Buttes Chaumont, which, on account of the peculiarly broken character of its site, is now one of the most interesting pleasure-grounds in Europe.

The court-gardener at Carlsruhe recently wrote to a German horticultural journal that many of the trees under his care had suffered terribly during the exceptionally cold season just past. Cherry-Laurels and Aucubas had frozen, and likewise Cedars of Lebanon, Deodars, *Sequoia sempervirens*, *Libocedrus decurrens*, *Cryptomeria japonica*, *Abies concolor* and its variety *lasiocarpa*, *Abies Webbiana*, *Picea Morinda*, *Pseudotsuga taxifolia*, and many other conifers had seriously suffered, and dead wood was already to be seen on many deciduous trees, while the whole damage could not be estimated until later in the season. But, says the writer, as was the case eleven years ago, when even native trees perished, no specimen of the Tulip-tree had suffered, neither an old tree, a sapling in the nursery, or a seedling. Even further north in Germany, he believes, this tree will prove itself hardy, at least in somewhat sheltered situations, if a slight protection be given to its roots while young. The beauty of the tree receives high praise at his hands, particular mention being made of an avenue in Carlsruhe, composed of eighty-one specimens measuring from one metre to nearly two metres in the circumference of their trunks. He deplores the fact that Tulip-trees are not more generally planted in Germany, and says that, in the avenue just mentioned, many naturally produced seedlings are found each year, all of which, when transplanted, prove perfectly hardy. He insistently recommends the end of April or the beginning of May as the best season for planting.

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The Decline of the Country Gentleman.

WHEN the first census of the United States was taken in 1790, about one-thirtieth of the population lived in towns of more than 8,000 inhabitants. The last census shows that nearly one-third of the people of the United States now live in towns of that size or larger, while, in the north Atlantic States, more than half the population is urban. In Maine, Vermont, Massachusetts and New York the increase of the city element is numerically greater than the total increase; that is, the rural population has actually decreased. This disproportion in the growth of city and country would appear more striking if towns of 4,000 or 5,000 inhabitants and upward were transferred from the country to the city class, as they should be, since their inhabitants live under conditions which are distinctly urban.

The growth of smaller towns and villages, as compared with the strictly rural population, has been quite as well marked. Taking an agricultural community like Sussex County, New Jersey, which is less than fifty miles from New York, it appears that the population has been practically at a standstill for sixty years, while the towns and villages in the county have increased many-fold. This means that the farms have lost a great proportion of what the towns have gained. In addition to the relatively slow growth, and, in some cases, to the actual decline of the rural population, it is to be observed that the lands have decreased in value. Taking this county of Sussex in New Jersey, as an example, it is a fact worth considering that forty years ago, before the inflated prices of war times, farm-land there, which was fifteen or twenty miles distant from a railroad, was worth fifty per cent. more than it is to-day, although it has convenient and direct railroad connection with this city. Nothing is plainer than the fact that the towns and cities are increasing in wealth, in population, and in influence at the expense of the rural communities.

Professor Rodney Welch contributed to the February number of *The Forum* a striking article on the changed condition of the American farmer. He drew a graphic picture of the life on a New England farm fifty years ago, where the inhabitants seemed perfectly independent because they were engaged in a husbandry which was domestic, and in which nearly everything in the way of food and clothing for the family was produced at home. There was no labor-saving machinery and little ready money then in rural communities, but there was much local pride and a society which considered itself a trifle superior in refinement and influence to that of the towns. The love of land and forests, of orchards and gardens, was inherited from English ancestors, and in the early years of the Republic, rural life was more highly esteemed than city life, and it afforded greater facilities for enjoyment and for physical as well as intellectual development. Country physicians and country divines took rank with the great preachers and surgeons of the capitals. Nearly all the students in colleges and professional schools came from rural districts, and the graduates returned to the neighborhoods where they had spent their youth. Most of the early Presidents and Governors of states were farmers, and in one early congressional directory a majority of the senators and representatives were farmers. A large proportion of the trustees of the colleges were farmers, and even professional men gave some attention to agriculture. In short, men who lived on their own farms and secured a competency and independence by the produce of their land were the most influential class of the country. As Professor Welch points out, there was quite as radical a difference between this agricultural class and the shifting population of commercial and manufacturing towns as there was between real and personal property. The country gentlemen were on their farms to stay there, no matter how prices or wages might vary at the factories or in the seaports. They felt a sense of dignity and responsibility as leaders in society and politics, and while they were the last men in the world to insist upon anything like different ranks in society they constituted as truly a controlling class in the nation as if they had been titled.

But the country has been losing its relative importance, and the migration to the towns has been rapidly accelerated during the last ten or twenty years. In many of the western states farmers obtained land for little or nothing, and improved it with the intention of remaining there, but as they became independent they divided up their farms into small tracts, erected cheap buildings on them, and leased them to persons generally of foreign birth. In this way it is said that in the states of Illinois, Wisconsin and Iowa more farms have been deserted by their owners, although for a different reason, than there have been in New Hampshire, Vermont and Massachusetts. In these New England states farms have been abandoned because it no longer pays to cultivate them as they have been cultivated. But, whatever the motive, the best blood of the country, and the very worst blood, too, finds its way to the cities. The tenant-farmers who are left in temporary charge of the land have little interest in sustaining schools of good character, or in improving the farms by erecting substantial buildings or by planting orchards and vineyards, or by setting out ornamental trees and shrubs. They lease the land from year to year, and have no permanent interest in it. When a stately residence, surrounded by lawns and pleasure-grounds, is now seen in the country, with evidences that it has recently been erected, it is probably not the home of a farmer. It is more likely to belong to some raiser of fine stock or to some man of wealth who has removed from the city for his health's sake or in order to manage a farm as a pastime. Wealthy farmers, like other people of means, desire the advantages of society, schools and amusements of one kind or another, and the town furnishes what the country fails to furnish for them. On the other hand, where a farm does not support its owner he turns to the town for a more attractive open-

ing for earning a livelihood. Thus it happens that the farms in many parts of the country are passing out of the hands of proprietors and into the hands of a tenant class. Most persons past fifty years of age can recall some rural community the character of whose population has entirely changed within their memory. The country gentleman, a term which we use for want of a better one to designate the man who earned an easy competence by tilling his own acres and who expected that his land would be the home of his descendants for generations, has been supplanted by a class of men who seem to lack not only his love for the land and his pride in it, but his stability of character, his public spirit, and his influence.

Now, it is a narrow view which looks upon this rapid growth and increasing importance of urban communities as an unmixed evil. Sanitary science has made life in the town more healthful than it was in the early decades of the century, and more complete organization has multiplied its comforts. If there has been an apparent decline in the social and political importance of some rural communities, the towns have gained what the country has lost. And yet the tendency we speak of cannot be altogether wholesome. The comparative prosperity and luxury of our cities are evidences that the men who transport and traffic in the products of the soil are receiving a larger proportion of the value of these products, while the farmer's share is growing less. With no peasant class, with the land tilled by men who own it and who govern it, agriculture, here if anywhere, should be a profitable and honorable calling. It is degraded from its proper rank among industries when the farmer's boy is eager to abandon his birthplace and sees, without a pang, the homestead pass into alien hands. The farmer of the old style had local attachment and local pride, and these sentiments formed the basis of a broad public spirit and an intense patriotism. From the homes of contented farmers has come the best blood of the Republic, and any decline in agricultural prosperity should be a matter of public concern. Men lose their love for land which cannot support them, and if the land bears any unequal burdens in the way of taxation or restriction, these should be removed. The men who carry the products of the farm and the men who stand between the farmer and the consumer form compact, well-organized bodies, able to command their full share of the profits of agriculture. Farmers are numerous and so widely separated that co-operation is impossible. That farmers suffer in this unequal competition is undeniable.

It is hardly to be wondered at that the discontented farmer listens to the specious arguments of professional agitators and is willing to waste effort upon sham reform. The questions involved are worthy of study by the most thoughtful men. How can the conservative practices of Agriculture and Horticulture be adjusted to the swiftly changing conditions of this growing country? How is the farmer to command his fair share of the value of the products of the soil? What can be done to make country life more attractive, wholesome and satisfying? Is it possible to restore the tiller of the soil to the position of consequence he once held in the social and political life of the Republic?

Early Spring in Central Park.

AN unusually long succession of hot days coming suddenly before the middle of April brought our vegetation forward this year with almost miraculous rapidity, so that by the first of May the parks wore an aspect rarely seen so early.

The Tulip-beds had been at their finest a week before, and the Forsythias were in full bloom by the 22d of April, when, too, the frequent plantations of Moss-pinks and blue Aubrietias were beginning to show their equally vivid colors. A week later these plantations were vivid indeed. In some places, especially where the Moss-pinks occupied rocky ledges or broken, scantily turfed slopes, their great masses of crimson-pink were extremely beautiful. But these essentially woodland flowers look less well when they spread in more uniform masses on smooth grassy inclines, where the edges of their carpets do not blend naturally with the herbage, but form a disagreeably sharp, artificial-looking line. And in one or two such spots where their crimson contrasted with the yellow of Forsythias growing just above them as well as with the uniform bright green of the lawn, the effect was striking enough, but distinctly inharmonious. The white form of the Phlox is, of course, better adapted than the pink for association with other strong tints, and is largely used in the park.

But still more beautiful, because more delicate and more natural-looking in most portions of the park-landscape, is the white *Stellaria Holostea*, which was also at its best on May-day, beautifying shady reaches and slopes of wide extent, especially along the West Drive. The loveliness of its snowy stars, sprinkled through the grass, but not forming thick clumps of unrelieved color like the Moss-pinks and the blue Aubrietias, could not be surpassed by that of any early spring flower.

At this same time the Judas-trees were in full bloom, and the Lilacs and Wistarias were beginning to pass from bud into flower; the Japanese Quinces and Forsythias had not yet dropped their petals; the various blossoming Plums and Cherries spread like snowy clouds; and, while the Dogwood clusters were not yet fully developed or entirely white, they were almost as charming in their immature shapes and creamy hue. Many very beautiful effects of contrasted color met the eye in traversing different parts of the park; but the most striking and harmonious we chanced to note was displayed by a large bed of shrubs on the West Drive near the turn which leads to the terrace at the lake end of the Mall. The foreground of this bed was filled with rather low groups of the Japanese Quince in both the red and the pale pink-flowered forms, the two varieties not being intermingled, but massed in considerable quantities. Above this array of scarlet and delicate rose color stood masses of Lilacs, much more crimson in the color of their flower-panicles than they would be when the flowers were all unfolded. And back of their ruddy purple stood, sharply defined against the vividly blue sky, the splendid rose-colored, flowery, leafless branches of small Judas-trees. There was just enough green in the foliage of the Quinces and the Lilacs to give relief and tone to the brilliant hues thus happily contrasted; and the picture they made proved that, whatever may be the case with a painter, Nature can easily succeed in associating pink and scarlet, purple and crimson.

Other flowers and blossoming shrubs will adorn the park with new garments of loveliness as the weeks go by, but at no future time will its general effect be so enchanting as during these first days of May. For then the wealth of low-lying color was not more attractive than the varied character of the canopies of higher foliage. Here we saw, as in some Horse-chestnut tree, a mass of green, already strong and deep and solid. There the Maple-leaves were half-unfolded, the leaves of the Liquidambar defined themselves as separate tiny stars, and each leaf of the Tulip-tree showed, still in miniature, its singular individuality of outline. Now the green was but a diaphanous garment, and again, only a faint cloud or a thinnest mist. On one tree it was not green at all but yellow, and on another a pale, soft gray. Where the Oaks stretched their infinitesimal but many-pointed leaves a careful eye could discover every tint of green, brown, gray, yellow and pink. And here and there were still, quite leafless trees, the delicate tracery of their branches exquisitely defined against their more enterprising neighbors. Of course there is a charm in mere priority. Early spring has a peculiar attraction of its own simply because it is early spring. But, quite apart from this, May is the most beautiful of months. Such variety, such endless kinds and shades of beauty, such subtile contrasts and unexpected harmonies, no other time can offer. Fortunate were those who, if unable to enjoy its tender yet swiftly passing phases in the actual country, could spend an hour or two each day in Central Park. Indeed, owing to the greater variety of its vegetation, a fine park is perhaps a better place than any but an exceptionally favored countryside in which to study the fullest beauty of early May.

As a rule, in laying out parks, the principal roads and walks should be so disposed as to leave the central parts unbroken, so that broad, quiet landscape effects may be had in looking across them; at the same time, they should be kept far enough from the boundaries to allow exterior objects, which may not be consistent with the designed scenes, to be screened from view by border plantations, and to admit of such a free and natural treatment of the intervening space as to avoid the suggestion of limit and confinement.—*Frederic Law Olmsted.*

Recent Botanical Discoveries in China and Eastern Burma.—VI.

Cyrtandreæ.—A group or sub-order of the *Gesneraceæ*, comprising about 500 described species, belonging to forty-two genera, all exclusively confined to the Old World. When Mr. C. B. Clarke monographed the *Cyrtandreæ* in 1883 only nineteen species were known to him from eastern Asia—that is to say, from China, Japan and Cochin China. Now about fifty species have been collected in China proper, and doubtless many yet remain undiscovered. Many of the Chinese species are exceedingly pretty, but they are by no means so brilliantly colored as the sub-tropical Gesnerads of the mountains of Mexico and South America, to say nothing of the gorgeous tropical members of this family in both hemispheres. Nevertheless, several of them are specially worthy of cultivation. *Primulina Tabacum*, though not one of Dr. Henry's plants, is of comparatively recent discovery. It is a native of the province of Kwangtung, and was figured in the *Botanical Magazine* last year (t. 7117) from plants raised at Kew two years previously; but it is a delicate kind of plant not likely to find favor with gardeners. Its strong resemblance in habit and flowers to some of the Primulas suggested the generic name, and the specific name was given in allusion to the strong smell of Tobacco which the living plant exhales. Indeed, the Chinese call it Rock Tobacco. The flowers are violet and white; and this is the only species of the genus hitherto discovered.

Turning to some of the more ornamental recent discoveries I may name *Oreschariş Auricula* (De Candolle's "Monographia Phanerogamarum," v., t. 6), *Didissandra speciosa*, *Didymocarpus rotundifolius*, *Didissandra sanatilis*, *Chirita eburnea* and *Bœa crassifolia*. All of these must be very pretty, and some of them, if easily cultivated, might equal the Chinese Primrose, of which they have the habit, as winter-flowering greenhouse plants. Of course so much depends upon the amount of care and time required to rear them. The prettiest, perhaps, of all these is *Didissandra speciosa*. It has thick, oblong, stalked, toothed leaves from three to five inches long, and very slender scapes rising well above them, and bearing usually one or two, though sometimes as many as five, pendulous flowers, much resembling in shape and coloring those of the pendulous Gloxinias; but they are narrower and perhaps of less substance. The largest of the dried flowers are about two inches long; and different gatherings are described as pink, purplish and bright blue, spotted with another color inside along the lower half. Dr. Henry states that it inhabits the face of vertical cliffs. This reads a little difficult for cultivation, at least for general cultivation, but when we know that our old favorite, *Primula Sinensis*, inhabits similar localities, we may rest assured that there is a possible future in our greenhouses for some of these beautiful Chinese Gesnerads.

I may so far digress here as to give Dr. Henry's note on the habitat of *Primula Sinensis*, the Rock or Winter Primrose of the Chinese. He says: "It grows on the ledges of rocky cliffs, where there is no soil and practically no moisture." He further adds that the rocks are limestone, that the flowers are produced in December and January, and that the flowers are pink, with a yellow ring round the mouth of the corolla-tube.

Didymocarpus rotundifolius has a cluster of radical leaves similar to those of *Saxifraga sarmentosa*, and relatively tall, slender scapes bearing an umbel of long-stalked, medium-sized blue flowers. *Didissandra saxatilis* has foliage very similar to that of *Primula Sinensis*, and bears a profusion of narrow tubular flowers, about an inch long and yellow in color—a color very rare in this family of plants. *Bœa crassifolia* has very thick fleshy leaves, like the Auricula, and slender umbels of "very pretty blue flowers," like those of a small Didymocarpus.

Before leaving this group I may say a word or two respecting two of the older members. First, there is the grand *Chirita Sinensis*, sent home by Fortune in 1844, and figured in the *Botanical Magazine* for 1847 (t. 4284), and previously in the *Botanical Register*, 1844 (t. 59). The figure in the *Botanical Magazine* gave evidence of what high cultivation would do, "the largest plants having borne a succession of twenty large trusses of flowers," and these nearly double the size of those represented in the *Register*. But even these are far surpassed by cultivated specimens sent to Kew from Hong-Kong by Mr. Ford, the superintendent of the botanic garden there. The flowers on these specimens are almost as large as the largest of the pendent Gloxinias; but, as Mr. Ford notes on the label accompanying them, they do not otherwise differ from ordinary *Chirita Sinensis*.

Lysionotus pauciflorus, which does not deserve the depreciative specific name, is the last I have to mention. It is a small under shrub, with small lanceolate leaves clustered at the ends of the branches, and white or pink flowers on slender stalks from the axils of the leaves. This apparently very pretty plant is found on the Ningpo Mountains and westward in the same latitude to west Szechuen; and it is also found in Japan; yet it has never, so far as I can ascertain, been in cultivation, and there is no figure of it. Fortune found it growing on old walls in the eastern province of Chekiang, but does not appear to have introduced it. Dr. Henry found it growing in clefts of rocks in the central province of Hupeh; and the Rev. E. Faber collected it on Mount Omei, in Szechuen, at altitudes of 3,000 to 4,000 feet. Finally, the lamented Maximowicz discovered it growing on trees in old woods in Nagayama Island, Japan.

Kew. *W. Botting Hemsley.*

How We Renewed an Old Place.

V.—On the Perversity of Certain Trees.

A FAITHFUL student of Garden and Forest takes exception to my calling trees stubborn and irresponsive, and says, "They are only stubborn and irresponsive when they are misunderstood and made to struggle against unnatural conditions; only give them a chance, and you will find that they will respond fast enough."

I feel that I ought to make an apology to my nurslings, many of whom have given me so much satisfaction, for this slur upon their character. I am not sure that it is not almost as bad as betraying a domestic secret; but the editor of these records has enjoined upon me in his kind introduction of them to be as honest about mistakes as about successes, in order to render them truly valuable, so that, lest you may be led away into thinking a tree-nursery freer from failings than a child-nursery, I must tell you the painful as well as the charming facts about them.

No one knows better than I how much some of the more satisfactory among them will do for one under kind treatment, but, all the same, I must reluctantly maintain that many of of them are freakish and disappointing; not, perhaps, so much from their inherent wickedness, as from the baneful influences of the world outside, the flirtations with insects of which they are capable, their predilection for ornamenting themselves with white-colored fungous growths which check their development, a perverseness about living, even when given the very best advantages, only paralleled by those Chinese servants who go and kill themselves if their master speaks sharply to them, and, above all, a stubbornness about adapting themselves to new conditions as great as that of a true-born Briton.

Your tree is the true conservative, and will insist upon its own way quite as unreasonably as a human being, even when you are sure you know what is better for it than it does itself. It is as hard to bring it to a new way of living as it is to bring about a constitutional amendment. If there is a spot where you do not want a tree to grow, notably a garden bed or your potato patch, there it will insist on coming up and making itself at home; but, take up this interloper and put it in a proper place, where you want it, and, ten to one, it will sulk and defy you.

One's favorites show in extreme youth a propensity to come in contact with cows' horns and the jack-knives of mischievous boys; that is another proof of ill-regulated character. They let their top-buds perish in the most careless way, and put out two leaders instead of one before you know it; they grow unevenly, they make themselves untidy with absurd little leaves up and down their stems, with a vague idea of keeping the sun off their trunks. One has a constant struggle with evergreens to keep their lower limbs in condition, they always prefer to go barefooted; indeed, I call one Norway Spruce I know of Sockless Jerry, on account of this very failing.

A crying instance of depravity I will give you in a moderate-sized White Ash on our lawn, which ought to be a stately tree by this time, for a neighbor tells us it has been growing there for forty years. Every spring it puts out a magnificent crop of new shoots, and we congratulate ourselves that at last it has really made up its mind to go ahead and reward us for all the digging around and high feeding we have given it; but in late June ominous yellow spots appear upon the leaves, great orange-colored excrescences disfigure the young shoots, and the first thing we know they are all shriveled and dying, and the ground underneath it is strewn with blackened leaves. Later it pulls itself together and gets out a feeble crop of young sprouts, just enough to enable it to hold its own from year to year, but which seem to add almost nothing to its girth, and very little to its height.

Now, can my correspondent tell me what is the proper punishment for that?

Of the perversity of Hemlocks I could write a volume. I knew something of their waywardness in the state of Maine, but even in Massachusetts, where everything is regulated by law, they show no higher sense of duty.

In vain do you coax along a beautiful little tree, carefully raised in a nursery till it has a fine ball of roots, to live and thrive for several seasons; at the end of that time you find it in the spring yellow and brown and bare, with every sign of premature decay about it. In a clump they may condescend to grow, or in a swamp, but if you don't want a clump, or a swamp on the lawn, what then?

Any one who has ever set his affections on a Peach-orchard knows something of the shameless coquetry of its behavior; and in the course of these papers I shall be compelled to record instances of misconduct even in the most innocent and carefully brought up trees, as well as in the wild and unsophisticated ones. Even the common White Birch, which will live anywhere and everywhere, and thrive on a sand-bank, goes and gets itself eaten up with Hessians the minute we try to utilize it on a lawn. Lombardy Poplars, too, in spite of much specious promising, behave shamefully; and I have known a Catalpa to grow undaunted in an enclosure for twenty years, and then succumb in a cowardly way to one cold winter. The fact is, though I am loath to say it, as a class you cannot absolutely depend upon trees, and when you say that—why, you say everything!

I have also a question to answer concerning our grove of Chestnut-trees, an inquirer wishing to know how we came to move such tall ones, and whether they came from the woods or from a nursery?

They were taken from a plantation of trees in our neighborhood, which had been made some years ago, on one of the neglected places hereabout. They had been set out when small, and left to take their chances without cultivation for certainly ten years. How much they had received when very young I cannot say, for their gardener has long since moved away. When we got them they were some three inches in diameter one foot from the ground, and slim and stately, with fairly good roots, but not like those of frequently moved nursery trees. We topped them when they were set in the autumn, and as they did not seem very vigorous, the next year we cut them back very severely, of different lengths, as an experiment. Some of them we left ten feet high, and one of them which had poor roots and looked sickly we cut down to within two feet of the ground.

Last summer they all put out vigorous tops with enormous leaves, but they are much beset by the aphis, which makes havoc with the first growth, and later by the insatiable rose-bug; yet, in spite of these drawbacks, they thrive in the rich deep soil of the swale, sheltered by the hill from the sun and the burning south-west winds. They are planted about fifteen feet apart, as we thought they would do better in close company, and they can be trimmed out when they are larger if it seems desirable. Smaller ones are set on the hill-side, where they seem to flourish, and some future generation may see our hill-side, like those noble slopes of the Connecticut valley, waving with their splendid foliage.

Since I have given up so much of this letter to answers to correspondents, I may as well also reply to the gentleman who inquires what books we found useful in planting our trees.

The public library of our small town, though it is full of excellent works on fruit-trees and horticulture, only afforded one book, "Elements of Forestry," by Franklin B. Hough, which treated solely of that subject in a large way; but it had also a late edition of Downing's "Landscape Gardening," in the appendix to which is a valuable paper by Mr. Henry Winthorp Sargent, in which he gives an interesting account of the way in which his own country-seat at Fishkill, New York, and that of Mr. Hunnewell, at Wellesley, Massachusetts, had been laid out, by two precisely opposite methods: Mr. Sargent having started in the midst of a forest, which he gradually cut away and adapted to his uses in the landscape; and Mr. Hunnewell having laid out his grounds in a region barren of trees, which he gradually developed into its present exquisite fertility. Some of Donald B. Mitchell's books—"Out-of-Town Places," "My Farm at Edgewood" and "Rural Studies"—also afforded valuable suggestions. The Massachusetts Agricultural Reports had many interesting statistics about the planting of Pines on a large scale in Plymouth County, and the books of the National Department of Agriculture have given additional details as we went along. Garden and Forest held up our fainting hands, and also made us suffer by publishing articles the day after the fair, which showed us how much better we might have done had we had the information a year or two earlier. In fact, we had reason to think ourselves among those

> Mountainous minds that were awake too soon,
> Or else their brethren slept too late,

for no sooner had we evolved an idea and put it in practice than at every turn the public press was crammed with views on this very subject which it had never seen fit to express previously.

Overlea labored under the enormous disadvantage of being born the year before Garden and Forest.

> Hinc illæ lacrimæ.

Had the periodical only been the elder, how much easier everything would have been! But, also, how afraid we should have been to undertake anything, having learned from it that we ought never to build without a landscape-architect, never to plant without the advice of an experienced landscape-gardener, never to suffer from mistakes that could so easily be avoided by proper appeals to a professional! But all this wisdom might as well have come in the next century as just a year too late, and so here we are, with all our blood upon our own heads, because we chanced to dig our cellar and make our contract in 1887.

As it was, we went to some scientific neighbors, who had done the same thing we were doing thirty years before with very distinguished success; and some of them gave us advice, and others gave us trees, which were even more to the purpose, and they kindly encouraged our efforts and took an interest in what we were doing, that sustained and cheered us on our way.

No one's experience, either in books or in real life, proved to be exactly like our own, so that we feel that we have had the benefit of an original experiment. Only time can fully reveal where our mistakes lie, for it alone can show whether we have planted not wisely or too well.

Hingham, Mass. *M. C. Robbins.*

New or Little Known Plants.

Ilex lævigata.

THE smooth Winter-berry, *Ilex lævigata*, of which a figure appears on page 221, although one of the most beautiful shrubs of the eastern United States, is one of the least-known and least-appreciated plants in all our eastern flora. It is nowhere very common, although it may be found from Maine to the mountains of Virginia, growing in low, wet, sphagnum-covered bogs, where it associates with the Cassandra, the Nemopanthes, and other water-loving plants. It is little known to people whose powers of botanical observation have not been trained, and is usually confounded by them with the much more common Black Alder (*Ilex verticillata*), which it resembles in many of its general features. It grows, however, in wetter situations than that plant. The fruit, which is bright red and not scarlet, ripens early, and falls in the autumn, while the fruit of the Black Alder remains on the branches during the winter months. But the two species can be most easily distinguished in the autumn by the foliage; that of the smooth Winter-berry turns, rather early, bright yellow, while the leaves of the Black Alder remain green until they are blackened and destroyed by severe freezing. Another character which separates the two plants is found in the pedicels of the sterile flowers, which are long in *Ilex lævigata* and very short in *Ilex verticillata*. The leaves of the former are lanceolate or oblong-lanceolate, pointed at the two ends with small appressed teeth on the slightly revolute margins; they are two or three inches long, and are bright and lustrous on the upper surface, rather paler and usually quite glabrous on the lower surface, with the exception of a slight pubescence along the midrib and principal veins. The sterile flowers are produced on slender stems, varying from a third of an inch to an inch in length. The fertile flowers are sessile or short-stalked. The flowers are pearly white, a quarter of an inch across when expanded, and appear about the middle of June. The fruit ripens in September, and is from a quarter to a third of an inch in diameter.

Ilex lævigata is a graceful shrub, eight or ten feet high, with pale branchlets covered with minute lenticular dots and smooth, brownish green stems. It flourishes when transferred to the garden, and grows apparently as vigorously and rapidly in garden soil as in the deep, undrained swamps which it has selected as its home. In the autumn it is one of the most brilliantly fruited plants in the Arboretum; and it is one of the best of our native shrubs to cultivate when effects of autumn colors of fruit and foliage are desired. *C. S. S.*

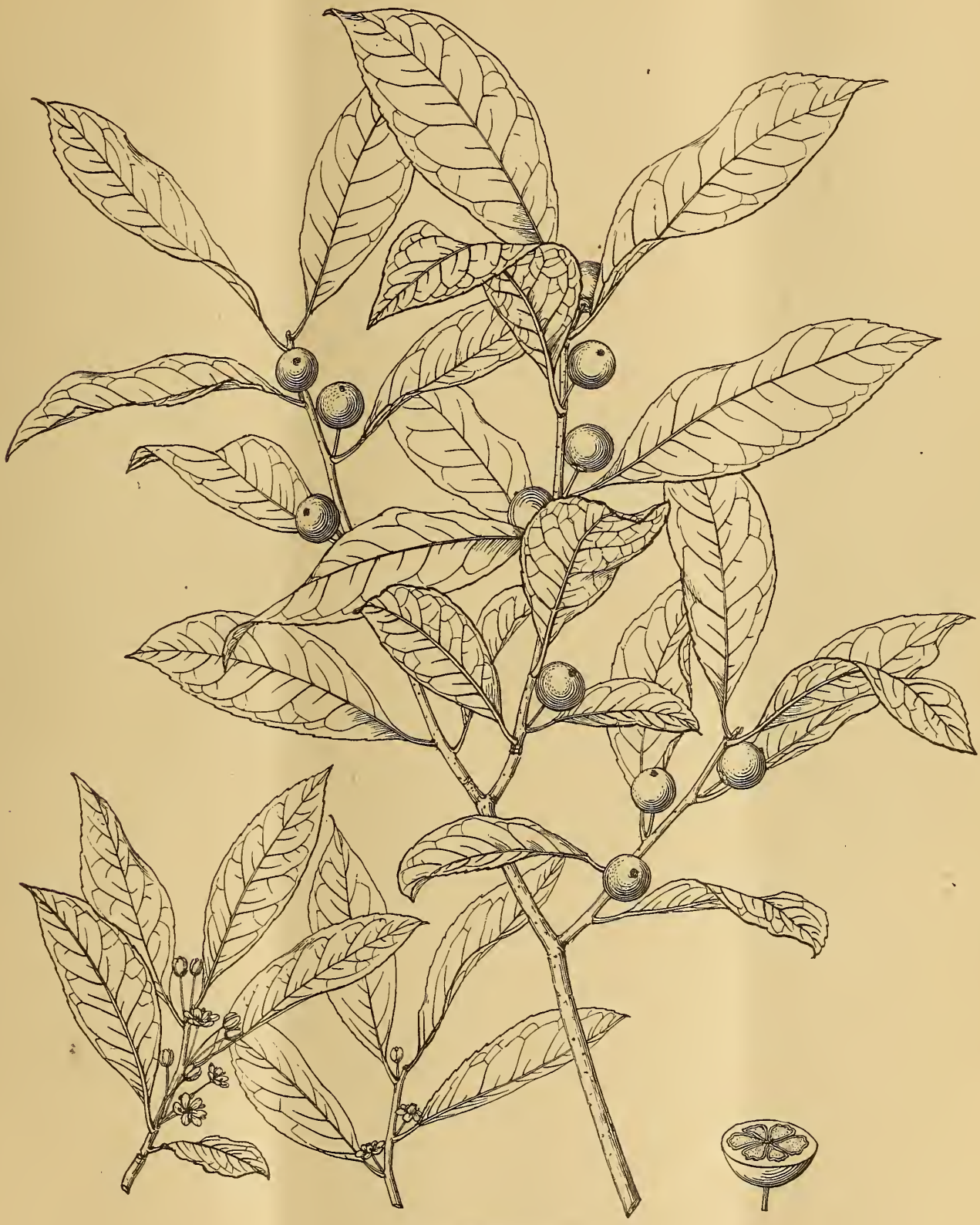

Fig. 39.—Ilex lævigata.—See page 220.

Crinum giganteum.

THIS appears to be as common in the moist tropics of Africa as *C. Asiaticum* is in Asia. It occurs in the collections of almost all African travelers, and, although an old garden plant in England, it has been introduced several times recently as a new species of exceptional beauty. It is gigantic only in the size of its flowers, the stature of the plant being considerably less than many of the evergreen Crinums. It has a short-necked bulb, thin gray-green

channeled leaves about two feet long, the base narrowed almost to a petiole, the widest part being about four inches across. The erect scapes are produced several times a year at varying seasons, and they are from eighteen inches to two feet long, with a loose umbel of from four to twelve pure white flowers, which have a curved tube and broad spreading segments, so that the flower when fully open is five or six inches across.

The flowers are powerfully and deliciously fragrant, and they last about a week. This species requires plenty of moisture all the year round, and it is happiest when planted in a large pot of rich soil, or, better still, in a bed. In the Palm-house at Kew it is perfectly at home, and the illustration on page 223 is taken from a specimen growing there. The plants thrive in the beds under the shade of the large Palms, treatment which also suits *Eucharis amazonica* and some of the tropical Pancratiums. There does not appear to be much, if any, difference between *C. giganteum* and *C. Careyanum*, while *C. podophyllum* is only a dwarf form of the first-named. *C. nobile* is another synonym of *C. giganteum*. In 1806 a figure of this Crinum was published in the *Botanical Magazine* as *Amaryllis ornata*, or "Cape Coast Lily." I recommend this plant as a really first-rate stove-bulb.

Kew. *W. Watson.*

New Orchids.

Odontoglossum × Andersonianum imperiale, O'Brien, is a handsome variety which appeared in the collection of W. J. Thomson, Esq., of St. Helens, Lancashire. It is described as having segments of the size of *O. crispum*, blotched with chestnut-red on a pale yellow ground.—*Gardeners' Chronicle*, March 14th, p. 330.

Masdevallia biflora, Regel.—A species which was imported by Roezl from the province of Santa Martha, in New Granada, and was received at the Royal Botanic Garden of St. Petersburg in 1871. It belongs to the *Amanda* group, and is allied to *M. polysticta*, Rchb. f. It is compared with *M. caloptera*, Rchb. f., but is nearer *M. pachyura*, Rchb. f.; indeed, it appears to me to be synonymous with it. It has a white perianth, with two or three purple stripes, at the base, and short yellow tails.—*Gartenflora*, xl. (1890), p. 90, t. 1341, fig. 2.

Odontoglossum × Clacsianum, L. Linden, is a very handsome natural hybrid, evidently derived from *O. crispum* and *O. luteopurpureum*. It was imported with a batch of *O. crispum*, collected by M. F. Claes for L'Horticulture Internationale, Parc Leopold, Brussels, and flowered in that establishment about the end of last year. At a meeting of L'Orchidéenne of Brussels, it was awarded a certificate of merit of the first class. It is now in the collection of M. G. Warocque, of Mariemont. The segments are broad, white and heavily blotched with bright red-brown.—*Lindenia*, t. 271.

Kew. *R. A. Rolfe.*

Recent Plant Portraits.

The most interesting plant for the general reader figured in the April issue of the *Botanical Magazine* is doubtless the Vanilla (*Vanilla planifolia*, t. 7167), the plant which furnishes the vanilla of commerce. It is a Mexican Orchid, with long climbing stems and thick fleshy leaves. The earliest European travelers in Mexico found the vanilla used as a condiment with chocolate. The Spaniards introduced it into Europe, and the first account of it appeared as long ago as 1605, and was published by Clusius in his "Exoticorum Libri," who received a specimen from Morgan, the apothecary of Queen Elizabeth. Plumier called the plant Vanilla, adopting the name used in Mexico by the Spaniards (the diminutive of the Spanish *vaina*, a pod). Toward the end of the seventeenth century the Vanilla reached France by the way of Spain, and was used to flavor chocolate, and to perfume tobacco. In England it was first valued as a drug, and it was not until after the idea of its medical value was exploded that it came into general use in cooking. The supply of vanilla, which is obtained from the fruit or seed-pod, was originally derived from Mexico, but of late years much attention has been given to cultivating this plant in other parts of the tropics, and it is now produced in Bourbon, Java, Mauritius and Central America in large quantities.

An excellent account of the Vanilla-plant, and of its properties and uses, will be found in Fluckiger & Hanbury's "Pharmacographia, or A History of Drugs," where the cultivation of the Vanilla is described as very simple. Shoots, about three feet long, having been fastened to trees, and scarcely touching the ground, soon strike root on to the bark and form plants, which commence to produce fruit in three years, and remain productive thirty or forty. The fertilization of the flower is naturally brought about by insect agency. Morren, the director of the Botanical Garden of Liége, showed, in 1837, that it might be efficiently performed by man, since which the production of the pods has been successfully carried on in all tropical countries without the aid of insects. Even in European forcing-houses the plant produces fruits of full size which, for aroma, bear comparison with those of Mexico. In Vanilla-plantations the pods are not allowed to arrive at complete maturity, and are gathered when their green color begins to change. According to the statements of De Vriese they are dried by a rather circuitous process, namely, by exposing them to heat alternately uncovered and wrapped in woolen cloths, whereby they are artificially ripened, and acquire their ultimate aroma and dark hue.

Interesting, too, is the figure (t. 7171) of the single-flowered form of the Banksian Rose. The double-flowered white and the double-flowered yellow Banksian Roses are well-known plants, especially in our southern states, where they grow to a large size and flower abundantly year after year, but the single-flowered type from which these plants were derived by the Chinese has only recently come to light. It was first sent to Kew by Mr. Hanbury, from his garden near Mentone, and also by Paul & Son, the well-known nurserymen. Judged by the figure, it is a more beautiful plant than either of the double-flowered forms, and will prove a decided acquisition in our southern gardens as well as for cool conservatories at the north, where the Banksian Rose is one of the most desirable of climbing plants.

There are also figures in this issue of *Asarum geophilum* (t. 7168), a species of southern China; and of *Epidendrum Sceptrum* (t. 7169), a striking species found on the coast regions of the Caribbean Sea, from Cumana to Santa Martha and New Granada, and to Ocana. It belongs to a section of the genus in which the lip is more or less adnate to the whole length of the column, with a few leaves arranged at the top of the pseudobulb and a terminal erect inflorescence. There is a figure also of *Furcræa Bedinghausii* (t. 7170), a native of Mexico.

The cone of a beautiful Mexican Pine which is met with in many gardens of northern Italy under the name of "Del Doctor" is published in the issue of the *Gardeners' Chronicle* of April 4, and is referred by Dr. Masters to the *Pinus patula*, var. *macrocarpa* of Schiede.

Cultural Department.

Out-of-door Roses.

Hardy Roses should now be progressing nicely in growth, but will need some attention from time to time in order to discourage the various insects to which they are subject. One of the best applications for this purpose is powdered Hellebore, if of good quality, for unless it is fresh and pure it is valueless as an insecticide. Another preparation that I have used with success on out-of-door Roses is "Slug-Shot," which may be dusted over the plants in the early morning, just as Hellebore is applied. In the absence of either of these, some slaked lime may be dusted on the plants to act as a check on some insects, though not necessarily on all.

As the buds appear on the Roses a good top-dressing of manure will be a benefit to the blooms, unless the plants have been heavily manured before.

For general decorative effect the claims of the Prairie Roses should not be forgotten, for when such varieties as Baltimore Belle and Queen of the Prairies are allowed to ramble carelessly over an otherwise unsightly fence they make it a thing of beauty. The two well-known varieties mentioned above are among the best of this section, though Gem of the Prairies is also a good one, and the single *R. setigera* is for many purposes the best of all.

In the treatment of these Roses it will, of course, be remembered that, in common with other climbing Roses, they do not like hard pruning.

Many persons enjoy a dark Rose, and to such Charles Lefebvre is suggested as a good old variety; it is a better Rose for out-door work than for forcing. It is dark crimson in color, rich and velvety in appearance and of good form and substance. Another good one is Fisher Holmes, of somewhat similar character. Its color is much like that of General Jacqueminot, but the flower is more full.

Fig. 40.—Crinum giganteum.—See page 221.

Among the many pink Roses John Hopper retains a place in the foremost rank for outside use; its firm, large flowers being of excellent color, while for free-blooming it has few equals.

It has been suggested that the white La France, so-called, Augustine Guinnoiseau, one of the much-praised novelties of the present season, may prove a valuable white variety for summer cut flowers, but this, of course, has not yet been tested. If it should prove as free in blooming as La France, and have the same charming form, it would certainly be a particularly beautiful white Rose. For bedding purposes the Polyantha Roses are gaining in favor each season. Clothilde Soupert, especially, has the good opinion of many last year, while the sales of the older sorts of this class do not fall off much, if at all.

One of the very best Teas for out-door planting is Marie Van Houtte, a strong grower and free-bloomer, with flowers of good size and very firm and double. The outer petals of this Rose being tinted with pink does not seem to be an objection to it when planted outside; in fact, the contrast with the pale yellow of the interior is quite pleasing.

André Schwartz also produces some fine buds at times out-doors, and of deep red color, but this is not a satisfactory Rose in all localities, and therefore should not have a general recommendation.

As a forcing Rose the lamentable failure of this variety is fresh in the minds of many cultivators, some of whom, doubtless, found their experience rather costly.

Holmesburg, Pa. *W. H. Taplin.*

Tulips.

THE skill of the cultivator with one division of this family, that is, the Garden Tulip, is well known. At this season these plants are in bloom in the open ground, and we shall see them in flower again in the stores of florists, painfully out of season, in November, with short stems and scant foliage. When Garden Tulips are properly planted in the fall, with a sprinkling of clean, sharp sand around the bulbs, there is no reason why these should be renewed annually, if one does not object to seeing the foliage ripen off naturally in the beds. The summer occupants should be planted without disturbing the bulbs of the Tulips. When frost kills the tender summer plants, such as Coleus, Geraniums or China Asters, these should be cleared off and a good top-dressing given to the bed, and the second year's flowers, from the same bulbs, will be better than the first. The only objection to this system is, that Tulips are usually planted in the most conspicuous place in the garden, and the foliage, when ripening off, would look somewhat out of keeping with its surroundings.

And now, a few words in favor of some of the natural forms of the Tulip which are, to many, even more interesting than the highly developed products of garden art. *T. Greigi* has bright, flaming-red flowers, with a yellow bordered black centre and leaves with distinct brown blotches, not unlike those of a Dog's-tooth Violet in the markings. This plant is hardy, easy to grow, and, with proper care, will flower every year.

For several years past I have had a great deal of satisfaction from the cultivation of that charming species, *T. Turkestanica*. The pretty, though not showy, flowers of this little Tulip may be found on the first bright day after the frost is out of the soil. It is peculiar in bearing several flowers on a branched stem—I have seen as many as five. The leaves of this species are developed above ground in fall and are never injured by cold. It deserves to be more widely known. Another attractive species is *T. cornuta*, the horned Tulip. This is a robust species which flowers every year without assistance. The petals, instead of overlapping each other and forming a cup-shaped flower, are narrow and taper to a point; they are about four inches long and usually yellow, striped with red. This Tulip is seldom grown, though cheap and easily obtained, and is worthy a place in every garden. The bulb of *T. Oculus-solis*, the Sun's Eye Tulip, is of itself remarkable. Between the bulb and its outer covering is a beautiful lining of cotton-like hairs, so interwoven as to be a complete protection. The flower is bright red, with a red and yellow centre, and, although very beautiful and perfectly hardy, it is too rarely met with in cultivation.

T. Gesneriana is interesting as one of the recognized parents of the Garden Tulip. This species has a very good flower, though not as showy as its progeny. *T. Gesneriana Dracontia* is the parent of the varieties known as Parrott Tulips, which are difficult to succeed with in pots, although their flowers are pretty, curious, and in some varieties, as Monstre Rouge, really showy. They should be staked, as they are weak-stemmed, and fall down on the ground unless supported. They will not force at any season; as I write, pans that have been brought on slowly in cold frames have a number of flowerless bulbs. We shall try them in the open ground next season in poor soil.

There should be no difficulty with the culture of the species of Tulips any more than with the garden varieties. They are natives of Algeria, central Asia and the south of France, and this suggests the need of a somewhat dry soil. This is especially true during their resting season—our summer months. Very seldom does a summer pass when there is not enough dry weather to ripen them thoroughly and enable them to make a vigorous start again in the fall. If the species now in commerce were more generally grown, many others now known in European gardens would soon be obtainable here, and our Tulip-beds in spring would not all be of one invariable pattern in regulation bedding colors or made up of the still worse "mixed Tulips in fine variety."

South Lancaster, Mass. *E. O. O.*

The Hardy Flower Garden.

THE blooming of the Narcissi, Hyacinths and Tulips marks the second phase of the spring-garden. The small bulbous plants are generally past, and the garden, with the advancing season, the more showy flowers, and the rapidly increasing foliage of hardy plants, is showing new, but not greater, attractions. "When you wish to drive a nail home keep hitting it" is a good homely adage which will explain my insistence on the charm of the spring-garden. The flowers of spring seem of such special beauty, and so enjoyable, that it is difficult to refrain from advocating their culture. The constantly increasing nomadic habits of our people, who now almost invariably spend their summers away from home, is having a serious result on many gardens, as in such cases, of course, little attention is given to flowers. In such cases the spring-garden is the only one to be enjoyed. Of course, those who will not give the matter forethought can never have a spring-garden, for this, unlike summer bedding effects, can never be ordered ready-made of the florist. But with notes taken now, as the plants are in bloom, and a little forethought in the fall, a spring-garden is quite within the management and means of any one. This first week in May the majority of the Narcissi are past, though there will be a succession for several weeks still. There were so many varieties of these it seems the part of prudence to refrain from commending particular kinds, for they all have some merits, and certainly most remarkable contrasts; from the mammoth Sir Watkin to the minute Triandeus Albus is a long range of size and form, while between the white Cernuus and the deep yellow of Obvallaris may be found all shades of those colors. The Polyanthus Narcissus are usually recommended for in-door planting, for which their penetrating odor quite unfits them. With a good covering they can be grown out-doors in this latitude, and looking them over the other day, it seemed to me that a good bed of these would be very effective, as they bloom profusely, and their flowers are small and borne gracefully. Spring Snowflakes (Leucoium), now at their best, are worthy successors of Snowdrops. Triteleias are useful front-border bulbs with pretty but malodorous flowers—flowers which will not be plucked are not without their uses. Hyacinths are waning, their lumpiness always making one long for a hardy strain with the habit of the Roman varieties. Tulips, if properly selected, should be in good form till the end of the month. A bed of Tulips all blooming on the same day, of the same height and the same color, does not seem worth planting.

Of the small hardy plants, *Papaver nudicaule* is the showiest thing in the garden; strong plants are exhausting themselves in bloom, and will last till the great Oriental Poppies flaunt their banners of orange and scarlet. Seeds of the Iceland Poppy sown now will give a few blooms in early fall, and make strong plants for another season, and are perfectly hardy without protection. The alpine Forget-me-nots make neat mats of blue; while stray blooms of Aquilegias are heralds of a new season of these ever-charming flowers. *Androsace sarmentosa* proves hardy in my garden, and from each rosette is now displayed a cluster of the dainty pink flowers. Anemones follow Anemones, *A. sulphurea* being one of the most charming at this season. The Irises are gradually unfolding their beauties, *I. Sibirica*, *I. Chamæiris* and *I. pumila*, with its variety, Alba, being the Irises of the week.

Trouble, of course, it is to arrange for all such flowers, and perhaps many of them do not impress a casual observer—the

casual observer at present being mostly engaged in stealing accessible Lilacs—but there is a great enjoyment with it all, and one gathers in such a garden in a fine spring morning delightful impressions to help him during the cares of busy days.

Elizabeth, N. J. *J. N. G.*

Notes from the Missouri Botanical Garden.

THERE are few more attractive plants that bloom in early spring than *Epimedium violaceum*, a native of Japan, and first imported into Great Britain about the year 1839. It is said to be only a variety, a smaller form, of *E. macranthum*, and the handsomest of the genus. It grows about a foot high in a compact mass. Not only are the light violet flowers very numerous, large and showy, though not very durable, but the foliage of the plant is worthy of admiration after the flowers are gone. It is perfectly hardy in St. Louis, where the weather is often very severe. It seems not at all difficult to grow, and is perfectly healthy in a heavy clay soil and in full sunlight.

The largest of the wild Bellworts (*Uvularia grandiflora*) is now in bloom here. A fine clump is growing in full sunlight and in a heavy soil, and is quite as beautiful as it will average in its natural soil in the woods. Near it in similar soil and in the sun is a tuft of *Viola striata*, a low-growing form. Its very numerous creamy white flowers and dark thick foliage look fresh and attractive at this season.

Ranunculus septentrionalis and *R. fascicularis* are both in bloom. The former is a trifle the later in flowering, grows about eight inches high, and somewhat spreading, with numerous bright yellow flowers half an inch wide. The latter is the best plant on account of its earliness, its brighter yellow flowers and dwarfer habit. Neither of them is very showy, but they give variety to a large collection, and *R. fascicularis* makes a pretty addition to the early border.

Helonias bullata, now in bloom, is a rare and local species, usually about fifteen inches high. Its dense head of light purple flowers is borne at the terminus of its naked scape, and is quite showy. Its leaves lie close to the ground in a cluster near the tuberous root. It is a natural bog-plant, though it does fairly well on an upland loamy soil if in the shade.

Phlox divaricata is quite common around St. Louis, and finds its way into the shaded portions of the parks when allowed to, without being planted there. It is a pretty plant as seen in its natural home, and one of the easiest to cultivate.

Claytonia Virginica (Spring Beauty) is the most abundant of the early wild flowers here, coming in almost everywhere in moist shaded situations. In Forest Park there are acres that are white with it, and the children take great delight in gathering it, in spite of the rigid rules forbidding any one to pluck a flower.

Dicentra eximia seems as much at home here in the sun and in a heavy soil as could be desired, and the fine clump now in flower in the herbaceous grounds is one of the most conspicuous there.

Trillium grandiflorum and *T. erectum*, var. *album*, are both in bloom; also *Trillium sessile* and *T. recurvatum*. The latter is quite common here in favored situations.

Among the most striking of the trees and shrubs are the Magnolias, first of which to bloom was *M. conspicua*, with its large fragrant white flowers, closely followed by *M. Soulangeana*, *M. purpurea* and the *M. Lenné*, which is the most showy of the four, and is at its best stage about the time *M. conspicua* is past.

The Japan Quince and the Redbud, or Judas-tree, are both in full flower; the latter the more conspicuous, being entirely covered with bloom.

Botanical Garden, St. Louis, Mo. *F. H. H.*

Orchid Notes.

CHYSIS LÆVIS.—Good authorities have called this the best species of its genus, and yet it has fallen into unaccountable neglect. It is found in Guatemala and Mexico, and was introduced in 1829. A year afterward it flowered in England for the first time. The pendulous, pseudo-bulbous stems are from twelve to fifteen inches in length, wrapped almost completely with whitish, sheath-like scales, and terminating with several lanceolate leaves of nearly their own length, deciduous, light of texture, with prominent veins on the lower side, and of a pale green color. The drooping racemes, equaling a full-grown stem in length, appear with the new growth in late winter or early spring, and the scapes carry from five to eight half-spread flowers of heavy substance and enduring quality, and about two inches in diameter. The oblong sepals are pale yellow, with a free diffusion of orange on the inside, tipped green on the exterior; and the linear petals resemble them in color, but without the green; the trilobed lip is yellow, profusely marked with orange-crimson, and the stout column resembles it in color. The cultural demands of *C. lævis* are easily satisfied. It thrives in a basket, and from its drooping habit it looks better there than in a pot. Rough peat, with abundant drainage material, is best for the roots, and the whole should be lightly surfaced with sphagnum. A night temperature, ranging from sixty to seventy degrees, Fahrenheit, and copious supplies of water are required during the season of growth; but very little water, and a temperature of from fifty to sixty degrees will suffice during the long resting period which ensues.

EPIDENDRUM AURANTIACUM.—Only a small proportion of the large number of known Epidendrums are worthy of general culture, and these are decidedly whimsical and unsatisfactory in conduct. Sometimes they grow and bloom perfectly for years together; then, for no apparent reason, they become unhealthy and die, or they preserve their full vigor of growth and refuse to bloom. *E. aurantiacum* is no exception to the rule. It cannot be depended upon to produce its splendid flowers in anything like profusion; they appear regularly, however, and when one happens to secure a good crop of blossoms it makes full amends for a score of bad ones. This species is a native of Guatemala, whence it was sent to England by Mr. Skinner in 1835. The entire plant rarely exceeds fifteen inches in height. The flowers measure an inch and a half in diameter, and are borne in dense racemose clusters—the number in each cluster varying from five ten—which proceed from pale brownish sheaths at the apex of the pseudo-bulbs; the column yellow, the other parts of the flower being of a brilliant orange color, with occasional small patches of dark crimson on the lip. The blooming stage is reached in spring, and the flowers retain their vivid hue about a month. The most reliable way of getting this plant to flower freely is to grow it in a basket near the light, using a compost of rough peat and chopped sphagnum in mixture, and providing ample drainage of crocks and charcoal. The growth should not be hastened in any way, but rather allowed to proceed naturally in a temperature ranging from sixty to seventy degrees, admitting abundance of fresh air, and a free supply of water given as long as the process continues. A temperature from ten to fifteen degrees below sixty will not injure the plant when in bloom, the lower temperature, on the contrary, tending to preserve the flowers for a longer period than would otherwise be possible.

Cambridge, Mass. *M. Barker.*

The Wardian Case.

FOR a long time I used a modification of the Wardian case, which I found to be very valuable for a large class of house-plants, especially those which cannot endure the dust or air of an ordinary room. The Wardian case proper made its first public appearance about 1842, and was exhibited in this country at the World's Fair in 1851. It consisted of a zinc pan on a stand, over which was placed a glass case, making it nearly air-tight, and was used for the propagation of delicate tropical plants and for their transportation. By confining air and moisture the case constituted a little world by itself, and there was no need of adding water or of ventilating it. My own case was so far modified as to require occasional supplies of water. The tray was built as wide as could be passed through an ordinary door; it was seven feet long, and was mounted on a strong frame on castors; over this was built a stout frame set with the best plate-glass, two panes to each side and one for each end. The roof sloped up to a small top pane. Each end was hung on hinges, and served as a door. The depth of the tray was six inches. Instead of filling this with soil for the plants to grow in, I grew all plants in pots, which could be lifted out for rearrangement. The case was capable of any degree of ventilation, and was, therefore, adapted to a much larger range of plants than an ordinary Wardian case. Begonias, Ferns and Lycopodiums were often removed and the case given over to Fuchsias and other plants not suited to the Wardian case proper. I found it easily adaptable to Camellias, Azaleas and dwarf Oranges.

The charm of such a case for a lover of plants is very great. The frame should be built quite strong, especially if it is desired to suspend baskets from the roof. The cost of the one I had built was about $40; a very good one could be built for $25. The plants are always clean, and are free from red spider. There are, however, other insects that must be guarded against in a close, moist atmosphere, and it is possible to ruin

everything by letting the stand remain closed in the full blaze of a noonday sun. Such a case has also all the advantages of the propagating box, and most cuttings will root in it with astonishing promptness.

As a fernery, the Wardian case is always exceedingly beautiful. I found my own case equally well suited for this purpose. The tray was water-tight, and I once readjusted it to serve as an aquarium. These possible adaptations are suggested for the advantage of persons who may be inclined to try a case of this description.

Clinton, N. Y. *E. P. Powell.*

Points of Merit in Tomatoes.

THIS is the queen of vegetables, and one in which there is as wide a difference between the good and the bad as between a "frost" pear of the hedge-row and a well-grown Seckel. The ideal tomato may vary somewhat in shape, but, whatever that may be, there should be no deep corrugations or seams, the fruit being nearly smooth, although a slight depression along the line of natural division is not objectionable. The stem should always be relatively small and set in a very shallow basin. When it is large and set deeply into the fruit it is accompanied by a large pithy core extending into the fruit, and ruining it for slicing or for canning. The stem end of the fruit should be nearly flat or slightly rounded. When there are any marked projections here they will be sure to be imperfectly ripened at the time the rest of the fruit is in the best condition. As to color, tastes differ; but I have never yet found a tomato of the purple tint of the old Fiji, which was not of a sharp, hard, metallic-like acid, very much less pleasant than the mild, fruit-like acid of the true red or scarlet tomato; and I am quite certain that, were we to select ten of the best varieties, quality to rule, eight at least—and, I believe, more likely nine or all of them—would be found to be clear, bright red, with little trace of purple.

Of the interior of the fruit, the general opinion as to what constitutes merit is certainly at fault. Most people only ask for a solid, seedless, pulpless flesh. Fortunately, the fruit is too good to develop any such worthless variety as is thus called for. If you will carefully examine a tomato you will find that the greatest amount, and by far the finest flavor, is found in the pulp surrounding the seed, and that the flesh surrounding the fruit next to the skin is quite different, and greatly superior, to that in the interior divisions, which many people value as making a solid fruit. Often these interior divisions are made up of perfectly flavorless, hard, but corky, tissue. This is the case in an exceedingly large-fruited sort which I have grown several years for comparison, but have not considered worthy of a name or of general cultivation, although I am certain that this variety can be made to produce the largest fruit having the smallest proportionate weight of seed and the largest proportion of dry matter of any of the hundreds of sorts I have tried; and yet I have seen the Mikado recommended as the best variety because it stood first of any the writer had tested in these respects. My ideal tomato, as far as interior is concerned, is one in which the outer circle of flesh next to the skin is very thick, the thicker the better; the interior divisions few, and, consequently, comparatively large, and each completely filled with pulp. Seeds are of themselves a disadvantage, but as we never have pulp except surrounding seeds, we shall have to have a fair quantity of them in order to get the desired pulp. This pulp should be as thick as possible. We sometimes find fruit in which it is very thin, and in such cases it is usually quite acid. The pulp should be as thick or solid as may be, while the flesh, both of the outer circle and of the inner division, should be as soft and juicy as possible, thus making the fruit as nearly uniform in consistency as it can be made to grow. I would be as critical as to the flavor of the fruit as of that of a pear or apple, and insist that, to be good, a tomato must have a distinct fruit-like, sub-acid flavor. Lastly, the entire interior, except the seeds, should be in color as nearly like the deep, rich red of the outside as possible, making a fruit which is a delight both in color and flavor.—*Professor W. W. Tracy, before the Michigan Horticultural Society.*

Support for Garden Plants.—I am using this year 1,000 lineal feet of galvanized wire netting four feet wide. This cost, delivered, a little more than one half cent per square foot, and will last indefinitely if cared for. It is the cheapest of all material for Peas, Beans and Tomatoes. Last year I made a comparison between this and brush for Peas. The only expense of the brush was the cutting, hauling and setting. Allowing for the time of two men and a pair of mules and wagon getting the brush, the cost of the brush, good only for one year, exceeded the first cost of the wire, good for ten. This wire throws no appreciable shade, and for training Tomatoes is admirable, since there is always a place to tie to. In fact, but little tying is needed after the plants get well up, as a little attention to directing the shoots to and fro in the meshes supports them perfectly. Climbing Beans fairly riot over it, and there will be no bother about Limas failing to catch to poles. Light stakes, well set about ten or twelve feet apart, are all that are needed to support it, and short pieces of wire are better than the more permanent attachment of staples.—*Professor Massey in Orchard and Garden.*

Neviusia Alabamensis.—This shrub, which is interesting botanically from the fact that it is known wild in only one locality in the United States, deserves more attention than it has received for its ornamental value. In an earlier number of Garden and Forest (vol. i., page 212) it is reported as hardy in Boston, and here it shows perfect health. A plant in Meehan's nurseries is some six years old, and it is rather more than four feet high and as many in diameter, making a compact bush, and it is now covered completely with the tufted, feathery clusters of flowers, whose long white stamens make them very showy. It blooms every season, and becomes more and more beautiful as it gets older. It can be propagated by cuttings as readily as any of the Spiræas, and it is related to the Kerria and Rhodotypus, two of our very best shrubs from eastern Asia, which are also now flowering very finely.

Germantown, Pa. *J. M.*

Correspondence.

The Owl and the Sparrow.

To the Editor of Garden and Forest:

Sir,—I read with much interest in the columns of your journal the discussion upon the owl and the sparrow. I will only observe now, in continuation of what I have already said, that we have in France two chevêches—the large one, which is a little larger than a blackbird, although rather stouter, and the special enemy of sparrows; and the small one, called also chevêchette, rather smaller than a blackbird. This is a very rare animal, frequenting principally the mountainous regions of the east of France (Savoy, Dauphiny and Switzerland). It is known to very few people. The large chevêche, the bird which I have always considered the true *Stryx passerina*, is common in all parts of France, and is often sold in the bird market of Paris. It is more common in the south than in other parts of the country, and here the people use it as a means of capturing other birds. The method is amusing and original. It is carried on by the aid of a big basket, upon the top of which a chevêche is fastened. The hunter, or perhaps trapper would be more appropriate, seats himself inside the basket, and by means of a little hole in the side he protrudes a long piece of wood branched at the extremity, the two branches being so far apart that a bird attracted by the owl can seat himself upon one of the two branches. Once the victim has seated himself upon the branch the man within the basket pulls a cord which brings the two branches of the fork together and catches the bird by his feet. The bird is then drawn into the basket, and, being made to cry, serves to attract other birds, which are captured in the same way. A considerable number are sometimes caught by one man in this way in a morning, and when any one locality is exhausted the hunter picks up his basket and locates himself in another position.

One thing is certain, and that is, that sparrows are not common, and do no damage in towns or villages where the chevêche has become established, either in old walls, or in churches, or in the hollow trunks of Olive and other trees. They become more or less diurnal in habit, and hunt in the evening before sunset. They do not fly high, and often skim along the surface of the ground in pursuit of field-mice, which, with the sparrows, constitute their ordinary diet. It is not known that the chevêche pursues other game. It appears to me probable that it would support the winters of the United States at least as well as the European sparrow, for it occurs in the north as well as in the south of France.

Antibes, France. *Charles Naudin.*

An Old Orchard.

To the Editor of Garden and Forest:

Sir,—I own at present the oldest orchard planted by a white man west of Albany. In the year 1791 or 1792, Dominie Kirkland, missionary to the Oneidas, planted a small nursery of

Apple-seeds at the foot of what is now College Hill, in the town at present called Kirkland, a part of what was then the town of Paris. This nursery was on a grant of land made to the dominie by the tribe to which he preached the Christian doctrine. They were much attached to him, and the chief, Sconondoa, aided him in his horticultural as well as religious enterprises. Out of this nursery three or four orchards were planted. The dominie's own was on a slope of the hills overlooking the valley of the Oriskany, one of the most beautiful valleys in New York state. I remember the trees fifty years ago, as they stood in their prime, and all of them were giants, compared with modern Apple-trees. Now there are standing but a dozen out of one hundred. As the loss is clearly traceable to neglect for a few years, I feel confident that an orchard of seedling Apples might be kept in good health for one hundred and fifty years. I hope to preserve a few of those now standing for at least ten years more.

The fruit is perceptibly of the old English and French families of Pippins, Bellefleurs and Swanro. One sort only proved to be so very good as to deserve careful preservation. This is named Kirkland, after its planter. It is every way a Bellefleur, pure white when picked, but rich yellow in the spring. The shape is like the yellow Bellefleur, but rounder, core open, and less acid than most of the family. It keeps well into April, or even June, in a cool moist cellar. I have had samples keep entirely through a year into the next spring. It is, in fact, the best keeping apple I have ever grown that had good value. A curious feature of this seedling is that another tree from the same nursery bears an apple so nearly identical as to be distinguished only by close examination. The original Kirkland tree stood until 1889, when I was obliged to cut it, but have carefully preserved a sucker from the roots that is capable of replacing the old tree.

Clinton, N. Y. *E. P. Powell.*

The Broad-leaved Maple.

To the Editor of Garden and Forest:

Sir,—Since your correspondents have shown so much interest of late in relation to the hardiness in the east of trees from the Pacific coast, I send you some sprays of *Acer macrophyllum*, gathered from one of our trees here. We have three of them and they are all some twenty-five feet high. While young they suffered in severe winters, but for several years past they do not seem to have been injured in the slightest degree. The flowers of this Maple come out slightly in advance of those of the ordinary Sycamore Maple.

Germantown, Pa. *Joseph Meehan.*

The Rattlesnake Plantain as a Window Plant.

To the Editor of Garden and Forest:

Sir,—Some of your correspondents have recently shown that many wild flowers, even of shy-seeming sorts, lend themselves well to careful transplanting; and I should like to add a mite of evidence with regard to one which I have found a bo d and brave little bloomer even under conditions when nothing that could be called care was bestowed upon it. In my summer home on the shore of Buzzard's Bay I have fortunately made friends with two ladies who, living there all the year round, are examples of the incorrectness of the oft-repeated statement that country people neither know nor care much about wild flowers. Their kindly hands have brought me rarities for which, despite all Asa Gray's directions, I had searched with small success, and great bunches of other flowers which, while not exactly rare, I had rejoiced to find as mere isolated specimens. In a basketful of such treasures I discovered last July a Rattlesnake Plantain with white-striped leaves (*Goodyera pubescens*), the tall spike of which was in bud, and which, apparently by accident, had been taken up, roots and all. This I planted in the woods near my house in a shady moist spot close to a big rock, watering it at the time, but giving it no further attention save an occasional glance to see what it was doing. For many days it apparently did nothing, for though its flowers did not open, neither did they wither. Then, after a fortnight or more, they came into bloom as prettily and completely as though the plant had never been disturbed.

At Christmas-time, again, I received from these same friends through the post a box of greens and berries, and among them was another of these little Orchids with the root, embedded in moss and earth, still attached to the cluster of evergreen leaves. I gave it to a friend whose care is surer than mine and whose window is sunnier, and she set it in a saucer of water. The second week in April it was more than merely alive. It was putting forth new little leaves and bore a promising spike of flower-buds, although not so large a one as though the time were July and the spot a Plymouth County wood. Of course it was but a wee and modest plant compared with those usually seen in-doors in early spring. But its very unlikeness to such plants and the flavor of deep summer woods that hung about it seemed for the moment to put their showier claims to admiration out of court.

New York. *M. G. Van Rensselaer.*

Recent Publications.

Chrysanthemum Culture for America. James Morton, 1891. The Rural Publishing Company, New York.

This little volume is the first treatise on the Chrysanthemum which has as yet appeared in the United States in book form, and is an interesting compendium of the foreign and domestic history of the flower, with cultural details which the author considers best adapted to this country. The book also contains an extended list of synonyms and a good calendar of garden operations. Any writer on the Chrysanthemum at this time is hampered by the exhaustive manner in which both the history and culture of the flower have already been recorded abroad. Mr. C. Harman Payne, a London amateur, has made the history of the subject his own by searching out and recording the slightest facts connected with the flower in all countries where it is grown. Mr. Morton has summarized these annals, and has supplemented them with some points as to the American history of the flower. As for all details of culture, Mr. Edward Molyneaux has fairly illuminated this subject with such minuteness and clearness as to leave little to be said, except in the way of modification to suit climatic conditions. His writings, not only in his book but in his very extended monographs in the horticultural press, may be fairly considered among the curiosities of literature, for he has recorded not only notes on general culture, but special points on the different families and varieties, showing powers of observation which would be remarkable if applied to any subject. Mr. Morton's cultural details seem, in the main, sound and helpful, although there are points in practice upon which experts differ. The book would have been improved, perhaps, by more explicit directions as to some of the finer points of cultivation, such as the treatment of weak-growing varieties and the details of disbudding, both of which are important matters to novices. The list of synonyms is very full, and Mr. Morton has done a service in collecting such an extended catalogue. Curiously enough, one of the best-known examples is omitted, that of Domination, also called Mrs. G. Bullock and Milkmaid. Mr. Morton's lists of varieties are more open to criticism. We are at a loss to know at what exhibition blooms of Cullingfordii and Mrs. John Wanamaker would be allowed to be staged with Empress of India, etc., among the "best twelve Chinese."

Great care should be taken to secure correctness in the matter of nomenclature in hand-books of this sort, and the hasty proof-reading which has permitted some errors in this department is to be regretted.

Mushrooms: How to Grow Them. By William Falconer. New York: Orange Judd Co.

This is a compact treatise of 165 pages which has been prepared for the purpose of giving complete and accurate details of all the processes of Mushroom-culture both for home use and for market. In addition to his long personal experience as a gardener, Mr. Falconer has taken pains to visit many of the principal establishments where Mushrooms are successfully grown in this country, not only to examine the various methods employed, but to secure from the growers careful explanations of the methods employed by each. There are also chapters on the growing of Mushrooms by the gardeners who supply the London market, and a very interesting account of the productive beds in the caves underneath the city of Paris and its suburbs. One would think, on reading this little treatise, that such a delicious and nutritious article of food as the Mushroom should be abundant on every American table, for it seems so easy to raise them, not only by those who have a greenhouse or can afford a house especially prepared for them, but by every farmer or householder who can command a shed or an ordinary cellar. Every one knows that in certain old pastures Mushrooms abound in a wild state, and the directions for growing them in the fields are so simple that there appears to be little excuse for their scarcity. And yet, although their cultivation seems so easy to a reader who has never tried

to grow them, the fact is that a great many men who have attempted it seriously have failed, and it is probable that the Mushroom crop will prove more uncertain than the Bean crop to the average cultivator for many years.

To grow Mushrooms well needs some experience and needs constant care in the details of cultivation from the beginning to the end, and just here is the prime value of this little manual. The directions are full and minute, covering the smallest particulars, so that one who had never seen a single Mushroom growing could take up this volume, and by following the directions explicitly have a reasonable hope of some success. The first fifty pages of the book are in the main devoted to the proper construction of caves and houses for Mushroom-beds or for the proper adaptation of the beds to ordinary cellars and sheds. Then there are directions for selecting and preparing the manure, the making of the beds, the use of the spawn, the loaming, earthing, top-dressing, etc., even to the final work of gathering and marketing the crop. After this come some directions for invigorating old beds, and for the discouragement of insect enemies, together with a selection of receipts for various methods of cooking. The book has an excellent index and some illustrations which serve fairly well to explain the text; but it would have been more attractive if the publishers had taken greater pains in preparing the cuts and had printed them on better paper.

Notes.

The late Mr. Shirley Hibberd had formed in his garden a collection of ninety different varieties of Ivy.

The Flowering Dogwood, the Black Haw (*Viburnum prunifolium*) and the Sassafras are all blooming abundantly in the woods and hedge-rows near this city, and very beautiful they are.

The Messrs. Putnam are about to publish a book called "Practical Landscape-Gardening," by Mr. Samuel Parsons, Jr., whose long experience as Superintendent of Parks in this city has qualified him to write an interesting and instructive treatise.

Le Nôtre, the great seventeenth-century gardener, lies buried in the Church of St. Roch in Paris. His tomb was designed by Coysevox, one of the most prominent sculptors of the time, and one of those who had assisted him in decorating the royal gardens at Versailles.

A Philadelphia correspondent writes that a fine tree of *Magnolia Fraseri*, still standing in the old Bartram Garden, now Bartram Park, is covered with bloom and is a beautiful object. This is really one of the most beautiful of the native Magnolias, its large flowers having a tint of canary yellow which is very delicate, and their fragrance, too, is almost equal to that of our *Magnolia glauca*.

The leading article in the *Illustrirte Gartenzeitung* of Vienna for the month of April is devoted to *Begonia bicolor*, Wats. The history of its discovery in Mexico by Dr. Palmer, in 1886, is quoted from Mr. Sereno Watson's account in vol. xxii. of the "Proceedings of the American Academy of Arts and Sciences," and the article is accompanied by a fine colored plate, prepared from a specimen which bloomed last autumn in the Royal Belvidere Gardens at Vienna.

It is a matter of concern to some people that the blossoms have come, hereabout, and many of them have gone, without any heavy rain. There is a popular superstition that the so-called blossom-storm is in some way connected with a fruitful year. On the other hand, there has been a theory that a cold rain while the trees are in flower may prevent fertilization, and therefore injure the fruit-crop. Recent investigation seems to show there is no real basis for this belief. The blossom-storm, like the equinoctial, is an uncertain quantity, and, whether it comes or not, has little effect on the fruit.

William M'Corquodale, a Scotch forester of reputation and the forest manager on the estates of the Earl of Mansfield, died last month in his eighty-first year. He is spoken of as the acknowledged father of forestry in Britain. During the long period he was connected with the Mansfield estates he planted and raised thousands of acres of woodlands, and has done much to encourage the taste for planting in north Britain. David Douglas was a townsman of his, and in this way M'Corquodale early became interested in the conifers of the north-west coast, especially in the Douglas Fir, which he was one of the first to plant in large quantities as a forest-crop. Many contributions from his pen are found in the *Transactions of the Scottish Arboricultural Society*. He was ardently devoted to the interests of this society, and was a constant attendant at its meetings.

A particularly fine specimen of *Licuala grandis* is included in the small, but choice, collection of Palms and other foliage plants in the conservatories attached to the city residence of Mr. A. J. Drexel, in Philadelphia. The plant referred to is about five feet in height, and carries over twenty fine leaves, doubtless being one of the best examples of this handsome Palm to be found in the country. In the same collection are some nicely grown Gleichenias, among them being *G. flabellata*, *G. Speluncæ*, *G. dicarpa longipinnata* and *G. dichotoma*, the last-named being well represented by a specimen between five and six feet in diameter.

One of the most charming descriptions of English rural scenery which we have recently read may be found in *Harper's Magazine* for May, being the first instalment of Mr. Quiller Couch's account of a boat journey down the Warwickshire Avon. It is delightfully illustrated by Mr. Alfred Parsons, and one of his most effective pictures shows us "Guy's Cliffe Mill," with regard to which the author writes: "The beauties of this spot have been bepraised for centuries. Leland speaks of them; Drayton sings them. 'There,' says Camden, 'have yee a shady little wood, cleere and cristal springs, mossie bottoms and caves, medowes alwaies fresh and greene, the river rumbling heere and there among the stones with his streame making a milde noise and gentle whispering, and, besides all this, solitary and still quietness, things most grateful to the muses.' Fuller, who knew it well, calls it 'a most delicious place, so that a man in many miles' riding cannot meet so much variety as there one furlong doth afford.' The water-mill is mentioned in Doomsday-book and has been sketched constantly ever since—a low quaint pile fronted by a recessed open gallery, under which the water is forever sparkling and frothing, fresh from its spin over the mill-wheels or tumble down the ledges of the weir."

The death is announced, in his ninety-first year, of William Barron, a Scotch gardener, distinguished in his day, and at one time considered the highest authority in England on cultivated conifers. His greatest achievement was the formation of the gardens at Elverston Castle, the seat of the Earl of Harrington, in Derbyshire, famous for their topiary work and the great collections of coniferous plants which they contain. Barron made a specialty of moving large trees, and scoured the country round for old Yews and other large specimens with which to embellish the pleasure-grounds at Elverston. His greatest feat of this sort is said to have been the removal from the Buckland churchyard of the so-called Buckland Yew, a huge tree supposed to be more than a thousand years old, and mentioned in the Doomsday-book. Barron left the immediate control of Elverston some forty years ago, and established himself in the neighborhood as a nurseryman and landscape-gardener. For many years he was one of the most active figures in English horticulture, and was employed in all parts of the kingdom in executing works of landscape-gardening and in moving large trees. He was a man highly respected by every one, and his influence and example did much to elevate the profession of gardening in England. His portrait and a detailed account of his career, with views taken in the gardens at Elverston, appear in the *Gardeners' Chronicle* for the 25th of April.

Catalogues Received.

W. T. Alan, Greenville, Mercer County, Pa.; Collections of Plants for Bedding.—H. H. Berger & Co., San Francisco, Cal.; Bulbs, Seeds and Plants from Japan, China and Australia.—Cleveland Baking Powder Co., New York, N. Y.; Cooking Receipts.—F. W. Devoe & Co., corner Fulton and William Sts., New York, N. Y.; Paints, Oils, Varnishes.—B. A. Elliott Co., 54 Sixth St., Pittsburgh, Pa.; A Few Flowers Worthy of General Culture, Seeds, Trees, Shrubs and Small Fruit.—Benjamin Hammond, Fishkill-on-Hudson, N. Y.; Hammond's Slug Shot.—H. W. Johns, 87 Maiden Lane, New York, N. Y.; Asbestos Materials.—The J. L. Mott Iron Works, 86, 88 and 90 Beekman St., New York, N. Y.; Wrought Iron Tree Guards, Garden Rollers, Cast Iron Settees, etc.—Novelty Manufacturing Co., New Bedford, Mass.; The Climax Patent Pruner.—Wm. Paul & Son, Waltham Cross, Herts, England; New Roses and Florists' Flowers.—Waterbury Rubber Co., 49 Warren St., New York, N. Y.; Sphincter Grip Armored Hose.—F. W. Wilson, Wilson's Nurseries, Chatham, Ontario; Fruit and Ornamental Trees, Vines, Shrubs, Plants, Bulbs, etc.—The Yokohama Gardeners' Association, 21–35 Nakamura, Yokohama, Japan, and Glen Avenue, Oakland, Cal.; General Flowering, Ornamental, Hardy Trees and Shrubs, Bulbs, Climbers, Fruit Trees, etc., from Japan.

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The Report of the Secretary of Agriculture.

IF the agricultural industries of the country are to yield a greater profit in the future, it will be mainly because the work in our farms and gardens, orchards and vineyards, is conducted with greater skill and intelligence. If, then, Government is to give any assistance to agriculture, the best aid it can render is to give information which will help farmers and gardeners to decide correctly the questions which confront them in their daily practice. Of course, Government may give direct aid in other directions, as, for example, it may introduce new varieties of economic plants, or it may help in the battle with destructive insects, as it did recently by importing from Australia the parasite which has done so much to save the Orange-groves of southern California from the devastation of the pernicious scale insect. But, after all, the most effective work of the Government for agriculture must be educational. In the first place, then, the Government must gather knowledge in order to disseminate it. Either under the direct supervision of the department or under the various experiment stations which are now vitally connected with it, a corps of skilled workers must be employed to make such tests in various directions as farmers are unable to make for themselves. Many of these experiments are necessarily expensive, and can hardly be undertaken by private persons. Many more of them require such habits of investigation and comparison as only men of long scientific training are able to accomplish. Others, again, require a long series of years before any satisfactory results are arrived at, and such tests can only be entrusted to institutions with a continued life and a well-directed purpose. It is worth while, therefore, to examine the report of the Secretary of Agriculture, which has just been published, in order to form some judgment of the extent and quality of the work of his department.

It will be observed at once that this publication is far in advance of the reports of a generation ago, over which the newspapers used to make merry. Even in that early day these volumes contained much that was of profound and permanent value, although this matter was usually smothered under a mass of crude and ill-digested facts and fancies. In the main, however, these public documents deserved much of the contempt with which they were treated, and the current report certainly shows in a very marked way an improvement in scope and method. In the first place it should be remarked that this report is a very small part of the publications of the department during the year. A very interesting chapter of the book contains a summary of the publications of the department, and the list for the year covers five pages. These publications vary in size from bulletins of a few pages to bulky volumes. Many of these are monographs by men who are recognized as authorities in various fields of scientific study. We have just received, for example, a Report of the Entomological Commission on Insects Injurious to Forest and Shade Trees, which has been prepared by Dr. A. S. Packard. Our students of entomology have naturally been led to concentrate their studies upon garden and field-insects rather than upon forest-insects. This treatise, however, a revised and enlarged edition of an earlier bulletin, makes up a volume of nearly a thousand amply illustrated pages, and not only gives a careful account, so far as is possible, of the insects which attack various forest and ornamental trees, but describes the diseases which they cause, and gives directions for using the remedies and the various means of applying these remedies to shade and forest-trees. Among other publications of merit may be named Dr. Vasey's Catalogue of Agricultural Grasses and Forage Plants; Professor Wiley's treatise on the Beet Sugar Industry; Mr. Tratman's Forestry Bulletin on the Substitution of Metal for Wood in Railroad Ties; Dr. Merriam's contributions to the Study of the North American Fauna. In fact, all the divisions of the department have issued books or bulletins which have scientific and practical value.

One of the most interesting of the reports of the divisions, which are published in connection with the Secretary's report, is that of Professor Atwater, the Director of the Office of Experiment Stations, an office which has been established now for a little more than two years. This is interesting, not because it records any marked discoveries in science or improvement in practice, but because it promises in time to be very efficient among the agencies of the department. The experiment stations as yet have not given any adequate return for the large amount of money they cost. In the first place, it is difficult to find trained experimenters to conduct the station work, and, again, their work is not sufficiently specialized, but is spread over too much ground. Besides this, the Boards of Control are under constant pressure to show results, so that abstract research is neglected for superficial work, which makes some immediate show of practical use. However, it seems probable that these and the other causes of failure will be gradually eliminated under intelligent discussion. Ambitious and able young men graduating from the schools of this country and of Europe are ready to take occupation in the stations, so that, with a central bureau, which, in some measure, may unify and collate the work in the various states, we are justified in hoping for such efficient aid in the practice of the arts of agriculture and horticulture as can be furnished by a more thorough understanding of the sciences upon which these arts rest. The bulletins from this office have so far been judiciously compiled and edited, and their distribution must in time make a sensible increase in the popular knowledge.

Of some of the other special reports, like that from the Division of Forestry, we shall take occasion to speak hereafter; but the work in the Divisions of Chemistry, of Botany, of Vegetable Pathology and Statistics is shown to be worthy of respect, and the chiefs of these departments hold an honorable position in the republic of science. The Secretary's summary of the year's work is in the main judicious,

and altogether it would seem that even in fields which require specific training, popular opinion can be trusted at last to pronounce judgment upon the efficiency of our public servants and upon the quality of their work. The abuses in the matter of seed-distribution are being gradually cured, and we may hope that this bureau will finally be restricted to its only legitimate purpose; that is, of making a careful trial by means of skilled agents in various parts of the country, of new seeds and plants which promise to be of economic value.

We can see no reason why there should be a Secretary of Agriculture, with a seat in the Cabinet, whose position is essentially political, and who must of necessity be changed with every changing administration. The practical control of the educational machinery of the department, at least, ought to be invested in some officer whose standing as a man of science is universally recognized. The position of this man should be certainly as permanent as that of the Director of the Coast Survey. He should be able to make plans for work that will extend through more than one administration. But, after all, when we consider how much time and experience is necessary to organize a force of skilled workers in various branches of scientific inquiry, and how difficult it is in Washington to select men on any other principle than that of political availability, we ought not to complain of the progress that has been made, but rather to feel encouraged to hope that the work of the department will improve in quality as the years roll on.

It is now ten years since a bulletin of the Tenth Census set forth the fact that fires had swept over more than 10,000,000 acres of forest in the United States, and destroyed more than $25,000,000 worth of property in a single year. The publication of these startling figures caused wide discussion. The people of the country were generally informed through the press that even this enormous destruction was only a portion of the actual loss, for, in addition to the annihilation of so much forest wealth, the ruin of millions of seedling trees should be counted, besides the actual burning up of the soil or its deterioration in those qualities which make forests possible—that is, these annual fires not only destroy the standing timber, but they destroy the hope of timber in the future. Since the publication of this bulletin, forestry associations in various states and scientific societies have been passing resolutions on this subject and presenting their views to various legislative bodies, state and national, and yet in the first half of this month forest-fires were raging unchecked in half a dozen states, and the devastation has been unusually widespread. In most cases they have burned themselves out, or have been stopped by timely rains; very rarely has any human agency prevailed to arrest their progress. The fact is, that after a drought in the early spring, especially in a forest where loggers have been at work and have left the ground covered with dry branches, a fire once under good headway is practically uncontrollable. In Europe there is no longer any serious danger from these fires, because every one hastens to smother them as soon as they are started, and in this country the only way to prevent this wholesale devastation by flame is by an organized effort to arrest the fire as soon as it is kindled.

Of course, every state needs a special law relating to these fires, but even where it is made a crime to set fire to any woods or underbrush, either through malice or negligence, conviction is rare. For the same reason a forest-police can hardly be trusted as a protective agency until the whole community has an intelligent interest in forests. No law can be effectively enforced unless it has behind it a strong public opinion, and the fact that thousands of acres of Pine-lands have been recently on fire within a few miles of cities like New York and Philadelphia is a proof that there is no genuine popular appreciation of their value. Men who live on clearings in the forest, or on lands adjoining forests, will fire brush-heaps in the spring, especially when it is dry, although they know the flames will sweep over miles of wood-land. To them and to the public generally a forest has no value—it is waste-land, the prey of every trespasser. So long as forest-property is held in so little esteem our existing forests will have no adequate protection, and there will be small encouragement to plant new ones.

Do Americans Love Flowers?

The *Illustrated American*, as quoted by *Science*, maintains that Americans do not love flowers, because they are used, among the rich and fashionable, in reckless profusion for display rather than enjoyment. It is also claimed in *Science* that we are not a flower-loving people, because we accept botanical appellations for our indigenous plants, instead of giving them simple, homely names like the charming ones with which familiar flowers have been christened in older countries.

To this it may be answered, that what ostentatious dwellers in towns are guilty of is by no means to be accepted as a national trait. The place to study the characteristics of a people is not among the very rich, but among those in moderate circumstances, who make up the bulk of the inhabitants.

Any one who has driven through New England or the older middle states cannot doubt that there, at least, the people truly love their gardens, and the house plants, with which their windows, in winter, are stocked. Even the humblest dwelling has its row of flower pots, or tin cans, well filled with slips of Geranium or other bright flowers; and the hours spent over their gardens, by gentlewomen who cannot afford a gardener, are the best proof that the affection they have for them is a real and ardent one. We have known many a house mother, burdened with domestic cares, to rise before day to snatch an hour for weeding or watering her little border, that its fragrant contents might be of avail for a friendly gift, or an adornment for her own table. It is the rarest thing, in a New England village, to enter a room in summer and find no flowers disposed about it; and in the winter the eager question, "How are your plants prospering?" often comes before the conventional inquiries after the health of the members of the household. Their new varieties are discussed and exchanged; there are rare Chrysanthemums to talk about in autumn, and choice tulips and hyacinths to be complimented in the spring, and each one knows what her neighbor's garden is most famous for, and who is the most successful in her general management of her pets.

Many women are experienced botanists in their own locality, and can tell where every wild flower of the region is to be found. They rejoice, too, in the discovery of a new weed with as much enthusiasm as an astronomer shows over a fresh comet. Most of the men who live in the country are too busy to give much time to flower-gardens, but they show great interest and pride in those so carefully tended by their wives and daughters, and are ready enough to lend a helping hand, even though they may pretend to begrudge the space taken from grass or vegetables for what they think it their duty to call an idle diversion. But given a retired merchant, with not much to occupy his mind, and the chances are that he will soon be wearing himself out in loving labor among his Rhododendrons and Roses, taking pride in having the earliest and largest blossoms in his parterre, and conferring in a friendly way over the fence with his neighbors, who stop to consult with him on the best way of dealing with insect pests. Of course, in the remoter west, life is too strenuous to leave much space for flower-gardening. But we have seen flowers growing in a little enclosure on a frontier sheep-ranch, which had cost not only labor but self-denial, and yet they were hardly seen once a year by any save their owner. The care which it cost the mothers and daughters among the early emigrants to transport seeds and slips and roots of the old home flowers from New England to brighten new homes in the west has often been described, and the love with which these flowers are cherished by their descendants is well known.

It is to these people we must look to discover whether the love of flowers and gardening is implanted in a people, not to the wasteful and luxurious dweller in the town, who only uses flowers as a pretext for wanton expense. And it should not be forgotten that aside from this extravagance, which may show itself in the purchase of flowers, as in the purchase of other luxuries, simply because they may be rare and costly, the great body of common-sense people in the city buy flowers habitually because they love their beauty and fragrance.

As to the nomenclature there is this to be said: In older countries the people and the flowers lived together long before the botanist appeared, while here the botanists came with the early settlers to an unexplored field, found the new flowers, and named them before the people had become familiarly acquainted with them. The state flower of California has been introduced to the children of that commonwealth as the Eschscholtzia before they could spell it, but this does not prove any lack of love or admiration for it on their part. They have a pet name for the flower, too; and in all the older settled parts of the country wherever a plant or flower is so abundant or useful or obtrusive that there is need to speak of it a name is found at once. The children of New England call the wild Columbine, Meeting-houses, from their shape, no doubt, and with them *Viola pedata* is the Horse Violet, perhaps from its long face. The Houstonia, which is Bluets in some places, is Innocence in others. In northern New Jersey, the Marsh Marigold of other regions (*Caltha palustris*) is invariably a Cowslip. Last week children were gathering Dog-tooth Violets by the handful within sight of Trinity Church spire, and when asked the name of the flowers they expressed much surprise that the inquirer had never heard of Yellow-bells. Even Shortia, which hid away from botanists for a hundred years, had a name which was common enough to answer every purpose, and the man who first discovered it in any quantity was told by the dwellers in the mountain hamlet, where it was spreading over acres, that it was nothing but Little Colt's-foot. Even where botanical names have not been adopted outright as common ones, they have often been changed, just as Pyxidanthera has become Pyxie to all the dwellers among the New Jersey Pines. There are plenty of common names in every locality which have never found their way into the botanies.

American women wear flowers for adornment more generally than the women of any other country. This of itself is proof of the genuineness of their love for flowers. It is absurd to imagine that a custom so universal is based on any sham or passing fashion. The desire for display is prevalent enough, beyond question, but if any one doubts whether the admiration for flowers is an acquired taste—because it is fashionable to wear them—let him carry a handful of them through a city street among groups of children, where unsophisticated nature will find expression. The keen delight of these little ones, who will always accept such a gift, shows that the affection for flowers is an original instinct, which is as strong in this country as it is anywhere. Fashionable freaks and follies pass away, and flowers would have their brief day like any other craze if the regard for them was artificial or fictitious. The flower-dealers of the country need have no apprehension as to the future of their industry. It is based on one of the elementary wants of our nature. Flowers will be loved until the constitution of the human mind is radically changed.

A California Rose-bush.

THE illustration which appears on page 233 will convey to those of our readers who are unfamiliar with southern California a better idea of the possibilities of horticulture in that favored region than any description of a California garden could give. It is made from a photograph of the cottage occupied by Mrs. S. C. Barclay, in Los Angeles. The Rose-bush, which covers the front of the cottage, is only twelve years old, and its size and vigor show what rose-growing may become in California in the hands of an intelligent and careful cultivator. This particular plant is the old-fashioned Noisette Rose, Lamarque, a variety which thirty or forty years ago was the most popular greenhouse climbing plant in our northern states, and which is still occasionally found in old-fashioned gardens, both at the north and in the south.

The Lamarque is a rampant grower, with abundant handsome foliage, and in early spring produces a great crop of large clusters of double, white or slightly yellow, fragrant flowers. There are not many double Roses that are more beautiful, and not many plants that are more prolific, and the Lamarque, like several other old-fashioned and now neglected Roses, might be well restored to popular favor. The fact that it produces only one full crop of flowers in the year is one reason, no doubt, why it has had to give way to plants which flower with more or less regularity every month. None of the newer Roses, however, grow so vigorously or are more reliable, and to cover the rafters of a large conservatory at the north or to climb through the trees or over the verandas of a southern garden, no Rose which has yet been produced surpasses or quite equals this old-fashioned favorite.

How We Renewed an Old Place.

VI.—THE WRECK OF AN ANCIENT GARDEN.

WHEN the Swiss Family Robinson went ashore on their desert island they found all they needed to make them comfortable, on the wreck, from which, luckily, they were able to help themselves before the old hulk went to pieces. After that, every little thing which was quite indispensable came out of a wonderful bag that belonged to the worthy mother.

Since we landed upon the barren waste of this abandoned farm we have often had reason to compare the old house-lot with the ship, and the front yard with the mother's bag, for a number of trees and shrubs have been forthcoming from the one, while the other has proved an inexhaustible resource, not only for our own, but other people's gardens.

For, once upon a time, in the old house which is now no more, there dwelt two dear old ladies who took great pride in their garden, and stocked it well with all the best flowers of their day, and from it came bulbs and cuttings of roses, and roots of perennials, that still help to make beautiful the ancient gardens of this fine old town. They were women of refinement and learning, much respected and beloved, and the older people still warmly recall Miss Peggy and Miss Betsy, and the days when the old house was always a sunny and cheerful resort. After the place was abandoned and unoccupied for many years, people felt at liberty to come and help themselves to slips of the shrubs and to roots of the old plants, so that one might hardly hope to find anything of value still existing there; but when we came to clear away the rubbish, we were surprised to find what a tenacious hold the occupants had of the soil, so that, as the spring and summer months sped by, we were constantly surprised and charmed to find, in unexpected places, some shrub or flower that clung to its old haunts, and, half-hidden from the eye, bloomed away its sweet life heedless of observers.

Along an uneven old wall that had supported the terrace of the house, I had a bed dug, into which I transplanted such bulbs and roots as would consent to be torn from their original homes. This bed I call Miss Betsy's Garden, for I am quite sure that in old times that gentle soul must have watched and tended her favorites by this same sunny wall. There is one prim little Columbine which wears a minutely fluted lavender cap that I associate with her, and always call by her name. The flowers that come up in Miss Betsy's Garden are all simple and homely, but to me their quaint familiar faces are more appealing than the far showier and splendid blooms of to-day.

They must have family records of interest, these lady-like old blossoms. Those yellow Daffodils, with their long green ribbons, have nestled up against that wall till, no doubt, they regard it as an ancient castle, of which they are the chatelaines; and I am sure that dignified Narcissus must have a history. There is a sweet June Honeysuckle straggling there which breathes an old-time fragrance, and the tiny petals of the pale pink Bridal Rose which flutters beside it have the very tint of soft color one sees in the cheek of an ancient maiden. A wild Clematis seems to grow out of the wall itself. I have never been able to find its root, and every fall a Prince's Feather waves its tall plume where once it danced with a Lady's-slipper. The Pansies have all degenerated into Lady's Delights, and the Hollyhocks come up single, but here they grow and blossom beside a pendulous Forsythia, the seed of which was, no doubt, sown by some passing bird, for it is not, I think, one of the older shrubs in this village.

The rest of the garden is perfectly formless and wild. Nothing has been done to the old part of the farm, except to clean away the weeds and sticks that encumbered it, and the old plants have grown lank and tall along the fence and under the heavy shade of the trees. But here in the spring the ground is blue and fragrant with hardy English Violets that fill the air with perfume and blossom long before even the native White Violet, which leads the way among our New England flowers; and wherever you walk you come upon a Tulip, or a Star of Bethlehem, or a feeble Crocus choked by the strong grasses, and other Daffys are wagging their golden heads in sheltered spots, and later there are to be seen more sculpturesque Narcissus shining whitely under the shrubbery, "like good deeds in a naughty world." The Flowering Almond sends up spikes of bloom; the Periwinkle, white and blue, hides among its shining leaves, while the Moneywort has strayed away from the garden and made of itself a nuisance in the orchard, where it threatens to root out everything else. There also are great clumps of the giant Solomon's Seal in shady nooks, where they grow to wondrous size.

There are Lilacs, purple, white and Persian, in profusion, and the Mock Orange and Spiræas, all have their turn as the seasons go round. One White Lilac has shot up to the height of a two-story house, and now that the windows are no longer there to help one to gather them, it shows, when in bloom, a crown of inaccessible blossoms; others yield their wealth of flowers nearer at hand, and by the well, a Persian Lilac drops like a fountain with rosy jets.

No longer supported by the fallen house, a Trumpet Creeper, which trailed along the ground, has been clipped into a compact bush. A venerable Althæa, which we did our best to save, blossomed feebly for a season or two and then perished, deprived of the accustomed shelter of the porch, but great bushes of the old-fashioned White Rose abound, and there, too, is the sweet Blush Rose, beloved of the bee and the sturdy Hessian. A large Damask Rose still flourishes under the Lilacs, and a luxuriant Baltimore Belle climbs in reckless profusion over its confining wires. Where the fence stood is a low cluster of bushes covered in summer with a bold Red Rose, single and splendid, the remote parent, perhaps, of the Jacqueminot; they call it here the Russian Rose, but I do not know what its real name may be; and down in the orchard I found a bush of the dear, thorny, little Scotch Rose, the smell of which is laden, as is no other, with the memories of childhood.

There are clumps of Tiger Lilies and old-fashioned small Bluebells and Sweet Williams, and a Barberry-bush swings its yellow blossoms and red berries over the rear wall, and under the Box-arbor I found Spiderwort growing in great clusters.

One day, while strolling down along the orchard fence, a familiar odor, heavy and sweet, led me on to where a wild Azalea was hanging out its fragrant blossoms. I do not see why a hedge of these might not do well in this moist soil. I hailed this one with delight as a fine ornament to the place.

But what we like best is the fine old Box arbor, which has grown up from a garden border until its stout trees are now six inches in diameter, and nearly ten feet high, which shows their great age. They were fair-sized bushes when old men of this town were boys, and to make even a bush of a Box-plant is slow work. Here, shaded by a young Elm which has sprung up in the kindly shelter of these twisted old trunks, we sit and look out upon the meadow and the growing plants, and feel linked with the past by this memento of those who loved this garden spot, and toiled to make it fair and fruitful, even as we, too, toil to restore its beauty and productiveness.

Hingham, Mass. *M. C. Robbins.*

Winter Studies of the Pine Barren Flora of Lake Michigan.—IV.

In peat swamps, and also in wet sands, the Pitcher Plant (*Sarracenia purpurea*) may be studied. The leaves are mostly purple or wine-colored, striped sometimes with brighter lines. A nest of these leaves, resting on the Sphagnum, or among Cranberry-vines, is an attractive sight, aside from the interest which their singular form excites. Every curve and swelling of the vasiform leaf and of the hood is perfect, in harmony with the flowing lines of beauty, and the eye lingers on a beautiful shape. In winter they are mostly filled to the brim with water or with ice. When the latter is the case, by removing the integument a complete model of the cavity is obtained in ice. The water is limpid and the ice clear, except at the bottom of the cavity where objects that have fallen in have settled. The repeated freezing and thawing to which the pitchers are subjected by change of temperature does not harm them, for the tissues are not torn, and they are ready to resume their function of catching insects in the spring, and continue till the plant is supplied with a new growth of leaves.

The nest-like clumps of the Prickly Pears (*Opuntia Rafinesquii*) are very different in appearance and habitat, finding a congenial soil in the dry sands where they grow abundantly. The mixed character of our flora is well displayed by this and the Pitcher Plant, for the latter may be seen in the wet sand, and a few feet away the Prickly Pears and the Bearberry may be found growing. As the only representative of the Cactus family it is an object of special interest to the student of this flora. The winter aspect of the plants will at once be noticed. During the warm weather the joints of the stem are green and plump, and the skin quite smooth, except on some of the oldest, and the stems are somewhat ascending, and some of the joints upright; in the cold season, though retaining their green color, they are much wrinkled, the skin wavy, and the joints are limp, lying flat upon the ground as if to expose as little of their surface as possible. The stiff tissues have become very pliable, and the stems, if lifted up, fall back like a weak or lifeless body. When partly buried in sand, or covered with dead leaves, which their irregular shape and spines well adapt them to catch and hold, they retain more of their summer habits and position. Their spines are sometimes rather formidable, though not present on all plants, or so greatly developed, except upon a few, where they become an inch to an inch and a half long, and stout in proportion.

Several of the herbaceous plants have not lost all their seeds, though the stems are dead. The cottony heads of Anemones, especially those of *Anemone cylindrica*, attract attention. They are swollen to an oblong bunch by reason of the loosened akenes, and the down is rusty-looking. The faded stems abide stiffly in their places, and contribute their part in giving variety to the scene. The pale pappus of the Golden-rods and Asters, and the hairy spikes of the Beard-grass (Ardropogon), still remain in quantities sufficient to remind one of the spots where they were common in summer; and when the ground is mantled with snow, and flocks of snow-birds and snow-buntings appear, such plants as these, rising above it, are a welcome source of food to these birds, lighting on the stalks to gather the seeds or skipping over the surface of the snow to pick up those which have been scattered by the wind.

Those interested in Mosses and Lichens will find many of these forms of plant-life in as good a state to investigate as in the summer. Dr. Henry Muehlenberg, a careful and diligent botanist in the days of firesides and back-logs, resorted to his wood pile for material of this kind in the winter-time, and considered it the best season for their study. Under date of January 18, 1811, he writes to his friend, Dr. Baldwin: "For Mosses, the present season is best. They are best distinguished when the operculum is ready to fall and the peristoma beginning to show itself. The Lichens we can often find at the fireside, and I have gathered a good number just before I put the wood in the stove or on the fire" (Darlington's "Reliquiæ Baldwinianæ," p. 26). But to enjoy such plants and discern their beauties, to learn some of the lessons they may teach, it is not necessary to be a bryologist or lichenologist, or be called by any such hard names, or even be skilled in the use of the compound microscope, though this instrument is indispensable if one would go very far.

The Reindeer Mosses (*Cladonia rangiferina* and allied species) here take to the sand as readily as in rocky regions they do to the rocks. The shapely clumps, usually circular in outline and with a rounded surface, resting on the bare ground, the dichotomous branching of the stems, their varied colors, pale, ashy-gray, greenish-gray, yellowish, pink and flesh-color, all please by their variety. The trunks and limbs of many of the Pines are spotted or nearly covered with the flat expansion of other Lichens, varying in shades of color, but mostly those of gray. These colors are too subdued for brightness, but harmonize well with the dark-colored bark of the Gray Pine, there being enough of contrast for good definition, and the boll of the tree, however small, when provided with the Lichens, takes on the appearance of age. Species of Usnea, with long, glaucescent stems depending from the limbs of trees, are not common as they are farther north, where they hang from the limbs in such quantities as to make the bearded trees, look venerable.

Several of the common mosses are quite noticeable in winter. In patches on the sand are the light green, or the yellowish green tufts of one of the most abundant kinds, *Ceratodon purpureus*. The cushiony tufts vary in size and shape, being as small as a coin to a foot or more across, and round, oval or irregular in shape. The fruiting-stems have already started, and in early spring the bunches will be bright with purple stems and capsules. Much like them are the tufts of Bryum, but with stems less condensed. In marked contrast with these, both for stoutness and color, are the stems of the White Moss (Leucobryum). The compact tussocks are almost white, or white tinged with green, and are very pale, spread out at the base of some sheltering tree, the soft cushions are very inviting as a place of rest in summer, but, if tried, may be found as fully saturated with water as the stems of the better-known Sphagnum, able to absorb seven or eight times their weight of water. Wherever they are, these cellular Mosses aid the trees under whose shade they grow, by helping to retain the moisture near their roots, and enriching the soil with humus when the stems decay, and thus find their rôle in the economy of nature. Large reaches in the damper grounds are carpeted with the Hair-cap Moss (*Polytrichum commune*). Its sharp, slender leaves, resembling those of the Juniper, have an evergreen look. The stems are tall for a Moss, sometimes nearly a foot in height, and in walking through the soft beds one sinks into them ankle-deep. Another pretty moss growing in loose patches of considerable extent in the partial shade

Fig. 41.—A California Rose-bush.—See page 231.

of trees is worthy of notice for the effect its peculiar coloration has on the sandy ground. It is the *Thelia Leseurii*, of Sullivant. The round and closely leaved stems are barely an inch high, and of a glaucous-green hue, contrasting well with the surrounding sands. The leaves are beautiful objects when examined under a low power of the microscope, being thickly studded with lobed or star-shaped papillæ, which seem to affect the light they reflect, and contribute to the charm they have when seen in masses. I find this Moss nowhere except in the dry sands. It is assigned a range in our literature on Mosses from New Jersey south along the Atlantic, and in the southern states, but is not uncommon in the Pine Barrens here.

Englewood, Chicago. *E. J. Hill.*

New or Little Known Plants.

Clematis connata.

NO figure has yet appeared apparently of this handsome Indian Clematis, which produced flowers at the Arnold Arboretum at the end of October of last year, from a plant sent here three years before from the Royal Gardens at Kew under the name of *Clematis Japonica.*

Clematis connata * (see p. 235) is a stout woody climber, with ample long-petioled leaves composed of three to five remote leaflets, which are three or four inches long, broadly ovate, cordate by a broad deep sinus, coarsely and irregularly serrate, or sometimes slightly three-lobed and borne on stout petiolules one and a half to two inches long ; they are dark green on the two surfaces, with five principal veins and prominent reticulated veinlets. The flowers are produced in many-flowered panicles, and are campanulate, an inch long, and clear light yellow in color. The sepals are oblong, acute at the apex, pubescent on the outer and tomentose on the inner surface, and reflexed above the middle when the flower is expanded. The filaments are linear, and are coated with long silky light hairs. The fruit, which has not been produced here, is described as "silky pubescent."

Clematis connata is a native of the temperate Himalayas from Hazara to Sikkim, at elevations varying from 4,000 to 10,000 feet above the sea-level. The stems suffer here in winter, and are generally killed back to the ground. This, perhaps, accounts for its flowering so late in the season (October 27th), a peculiarity which deprives this species of much value as a garden plant in New England. It is, however, a rampant-growing plant with high-climbing stems, large bold foliage and beautiful flowers ; and in regions of longer summers and warmer autumns it will doubtless prove a desirable addition to the plants of its class, certainly well worth experimenting with in some parts of the middle and southern states. *C. S. S.*

Cultural Department.

Cinerarias.

THE Cinerarias at the gardens of Dr. C. E. Weld, Brookline, Massachusetts, this spring, were probably the best, taken altogether, which have ever been seen in this country. In a late number of the *American Florist* Dr. Weld's gardener, Mr. Kenneth Finlayson, describes his method of cultivating these plants, the main portion of which we herewith reproduce :

My experience with Cinerarias, especially with those sown early, say any time in June, and for early-flowering purposes, is that they require more care than most kinds of plants to pull them through the hot months of summer. It is a well-known fact that Cinerarias are very impatient of strong sunlight, such as we get here in the months of June, July and most of August, and the prime difficulty is in providing a temperature which suits them. My method is simply to shade the glass with a thin coating of white paint, and over this, on hot, bright days, I put a lattice shading. These lattice shades are made to fit over our sash (ordinary cold frame, or six by three feet). The bars run horizontally instead of crossing each other ; they are one inch wide and a quarter of an inch thick, the space between each bar being a trifle over half an inch ; the frames on which the bars are nailed are one inch square.

These shades I consider the best of all when shade is necessary, for the reason that they are movable, in the first place, and put on when really needed, and secondly, because they keep the glass cooler than any paint or canvas shading will do, thereby giving, as near as possible, the conditions most favorable to plants needing a shade.

I further lower the temperature by raising the sash at both ends by wooden blocks, cut longer than they are wide, and wider than they are thick, so that one block will raise the sash to three different heights, as necessary.

Syringing overhead in the morning and afternoon of hot, dry days is very beneficial to the plants under consideration.

Greenfly attacks these plants at all stages of their existence, but are easily kept under by fumigation. When in frames outside I strew tobacco-stems all round the pots in which the plants are growing, and find no difficulty in keeping them clean in that way. In the greenhouse I seldom have to resort to any remedy for these pests, as they do not attack them much. To some this may seem strange, but the reason is quite plain, and nothing more or less, in my opinion, than that the Cinerarias are kept in a temperature admirably suited to them, but less congenial to the greenfly, namely, forty and forty-two degrees Fahrenheit at night.

The soil I use for the Cineraria in the early stages consists of one-half leaf-mold and one-half good turfy loam, with a liberal dash of sharp clean sand added. At each successive potting the leaf-mold is withheld partly and the loam increased proportionately. The final potting soil consists of one-fifth leaf-mold, one-fifth good rotten cow-manure, the remaining three-fifths turfy loam, very little sand, a liberal dash of fine crushed bones.

The stimulating begins when the pots in which they are to flower are well filled with roots ; cow-manure, liquid, I use frequently, but chiefly guano and soot in equal parts mixed. I put a large handful of the latter in a six-gallon can of water and stir well with a stick, to incorporate the stimulating ingredients in the water before using. I apply this dose once or twice a week, as the weather demands—that is, if the weather should be bright there is more demand on the water-pot than there would be on cloudy days, therefore the stimulating must be regulated accordingly.

I use guano alone on almost every kind of plants, and on gross feeders, like Cinerarias, Calceolarias and Chrysanthemums, I use it in stronger solutions than do most cultivators.

Odontoglossum coronarium and O. brevifolium.

GREAT confusion has always prevailed among Orchid growers in respect to these two species of Odontoglossum. From the descriptions which have from time to time appeared in horticultural journals, it is evident that but one is referred to under both names—sometimes *O. brevifolium*, sometimes *O. coronarium.* This being the season of flowering, it will not be inappropriate to point out the differences between the two species, and to show that the plant, carelessly designated under both names, is in reality the true *O. coronarium*, as described by Lindley in his "Folia Orchidacea." How the confusion arose it is difficult to say. *O. brevifolium* was discovered about ten years before *O. coronarium*, but does not seem to have been successfully grown in Europe, and it is possible that the latter species, when introduced, was, in the first place, thought to be the true *O. brevifolium*, and was launched into commerce as such.

To afford some means of distinguishing the two species, which certainly appear to be closely related, it may be as well to state that *O. brevifolium*, according to Lindley's description in "Plantæ Hartwegianæ" (1839, p. 152), has ovate oblong compressed pseudo-bulbs, surmounted by a single leaf; the leaves are two inches broad, and sometimes not much longer ; the individual flowers are an inch and a half or more in diameter, and eleven or twelve are borne on a drooping raceme, being apparently purple in color. This species was collected for the first time, with many other Orchids, by Theodor Hartweg, who was dispatched to South America, in 1836, by the Royal Horticultural Society of England, in search of new and rare plants. Dried specimens and plants were sent to England, but, beyond the botanical description recorded in "Plantæ Hartwegianæ," nothing has ever since been heard of them, except when the name has been misapplied to *O. coronarium*, which has flowered several times, and has been

*1. *Clematis connata*, De Candolle, "Prod." i., 4.—Wallich, "Cat.," 4679.—Hooker f. & Thomas, "Fl. Ind.," 11 ; "Fl. Brit. Ind.," i., 6.
C. venosa, Royle, "Ill.," 51.
C. amplexicaulis, *C. velutina*, *C. gracilis*, Edgeworth, *Trans. Linn. Soc.*, xx., 27.

Fig. 42.—Clematis connata.—See page 234.

figured in the *Illustration Horticole* (1874, t. 170) and the *Orchid Album* (t. 27) unfortunately under the name of *O. brevifolium* in both works.

The distinguishing features of *O. coronarium* may be described as follows. The plant has a creeping rhizome, about as thick again as an ordinary lead-pencil, emitting thick, fleshy roots from the lower surface. Numerous pale brown scales are on the rhizome, and these gradually become larger and more foliaceous in character as they approach the base of the pseudo-bulbs, which are encased by some of them, and

are produced, one year after another, at intervals of two or three inches. The pseudo-bulbs are ovoid, compressed, with edges more or less acute, and are terminated by a single leathery, elliptic, oblong leaf, which varies from six to twelve inches in length, and is about two or three inches wide. The stout, erect scapes are produced from the base of the pseudo-bulb, and are from twelve to fourteen inches high, often carrying as many as eighteen or twenty large flowers on the upper portion. The lower portion of the scape is clothed with large, pale-brown, leafy bracts, the outer surface of which is spotted with purplish red, as is also the epidermis of the scape itself. The flowers appear in March and April, and each individual, borne on a pedicel about two inches long, would occupy as much space as a circle with a diameter of two inches and a half. The roundish petals and oblong-clawed petals are of a deep glossy brown—as if the surface were varnished—with a narrow undulated margin of clear yellow, which is very attractive. The base of the petals is creamy yellow, blotched with purple brown. In comparison with the sepals and petals the lip is rather small; it has an obcordate emarginate blade, narrowed toward the base, where it widens out into a small lobe on either side, having a three-toothed crest in the centre. The color is clear, bright yellow, with a forked stain of orange-yellow at the base, in front of the crest. The white column has its "wings" decorated with purple spots.

It must be admitted that, at first sight, the original botanical description of *O. brevifolium* would do very well for what is known to be *O. coronarium*, especially when Lindley adds what would seem to be an emphasizing remark, "flores magintudine et facie Oncidii crispii." By a stretch of imagination the same might be said of *O. coronarium*. But it is important to point out that *O. brevifolium* is described as having leaves often not much longer than two inches, and as carrying its flowers on drooping scapes, while it is well known that the leaves of *O. coronarium* are much longer than two inches, and that its scapes are erect. For ordinary purposes these two particular points should be enough to enable any one to distinguish between the two species, although there are other points of difference in the structure of the flowers.

O. coronarium grows wild in the northern part of the United States of Colombia. It was first discovered by Funck and Schlim in 1847, in the vicinity of Ocana, at altitudes varying from 7,000 to 9,000 feet above the level of the sea, and it is to the latter traveler we are indebted for having first dispatched living plants to Europe—to the nurseries of M. Linden, of Brussels.

Although one of the finest Odontoglossums in cultivation, it is very seldom seen in a good condition. There is always a certain amount of difficulty about its culture, and this being recognized, it is possible that many growers make matters worse by being too careful with it, coddling it in fact, an operation seldom successful. There are some, however, who experience no difficulty in growing this species well, and one of the finest specimens I have seen in flower was grown in the collection of Mr. R. N. Dale, of Bromborough Hall, Cheshire. It was exhibited at a recent meeting of the Royal Horticultural Society, but was first shown on May 1st, 1872, by M. Linden, and obtained a first-class certificate under the erroneous name of *O. brevifolium*.

Owing to what may be called the traveling propensities of the pseudo-bulbs (the production or evolution of which is analogous to that of the common Solomon's Seal), it is not possible to restrain the growth of this plant within the bounds of a pot in the usual way. Some other means must be adopted to suit its peculiarity, and one of the best is to fix the rhizome to a teak raft, having rough peat and sphagnum moss to grow in; the raft may then be stood in a pot filled with large clean crocks, which may be covered over with fresh moss to obliterate the otherwise unsightly appearance. *O. coronarium* will thus thrive in a moderately cool house, with plenty of light and air, and copious supplies of water, with frequent syringings during warm weather and the period of growth.

Isleworth, London, W. *J. Weathers.*

Æschynanthus.

THESE showy epiphytal plants are admirable for baskets in the conservatory. Being natives of India and the Indian islands, they require a high temperature and moist atmosphere. They are generally of a scandent habit and should be allowed to droop over the sides of hanging baskets. A mixture of fibrous peat, sphagnum moss, a little loam and lumps of charcoal makes the proper soil for them, and should have a liberal supply of water when growing, both at the roots and over the foliage. The orange or scarlet flowers are produced in both terminal umbels and from the leaf-axils.

A. cordifolius is a very free-flowering species, with dark green heart-shaped leaves. The flowers are in clusters, deep red striped with black, the inside of tube being orange. The variety is one of the best summer bloomers.

A. speciosus is more erect in growth, and bears very freely large fascicles of erect, long-tubed flowers of rich orange-yellow, with black markings.

A. grandiflorus bears large deep crimson and orange flowers, and *A. Lobbianus* rich scarlet flowers.

A. splendidus is a garden hybrid of very easy cultivation. The flowers remain a long time in perfection. The leaves are long, lanceolate and of a very light green color. The flowers are large, bright scarlet, spotted with black on the edges.

There are many other varieties, but all have the same general characteristics, and they are among the most beautiful summer-flowering stove-plants in cultivation.

Maywood, N. J. *James P. Taplin.*

Dahlias.

THE *Journal of Horticulture* gives, in a late number, some valuable statistics showing the relative positions of the best-known varieties of the Dahlia as revealed by their appearance at exhibitions in England in eight years—*i. e.*, from 1883 to 1890. Here are the first twelve in each section in the order of their rank:

Show Dahlias.—Mrs. Gladstone, pale blush; Harry Keith, rosy purple; W. Rawlings, crimson-purple; J. Cocker, purple; Hon. Mrs. P. Wyndham, pale yellow and rose; Henry Walton, pale yellow and scarlet; R. T. Rawlings, clear yellow; Mrs. W. Slack, blush white and purple; Colonist, chocolate and fawn; Maud Fellowes, pale pink and purple; Goldfinder, yellow and red; Mrs. Langtry, cream and crimson. The premier position has been held by Mrs. Gladstone, which is by far the best of all show Dahlias, five years in succession.

Fancy Dahlias.—Mrs. Saunders, yellow and white; Rev. J. B. M. Camm, yellow and red; Goethe, yellow, red and white; Chorister, fawn and crimson; Duchess of Albany, orange and crimson; Flora Wyatt, orange and red; Henry Eckford, yellow and red; Mrs. N. Halls, scarlet and white; Peacock, maroon and white; G. Barnes, lilac and crimson; M. Campbell, buff and crimson; Hugh Austin, orange and red.

In the following short lists the varieties are arranged according to the total number of times they were staged in competition at the last two exhibitions of the National Dahlia Society:

Pompon.—E. F. Junker, White Aster (Guiding Star), Darkness, Favorite, Gem, Rosalie, Isabel, Golden Gem, Lady Blanche, Grace, Little Duchess, Whisper.

Cactus and Decorative.—Mrs. Hawkins, Empress of India, Panthea, Amphion, Juarezii, Constance, Charming Bride, Cochineal, Henry Patrick, William Darvil, Zulu and Honoria.

Single.—Amos Perry, Miss Henshaw, Duchess of Westminster, Mrs. B. Coninck, W. C. Harvey, Cetewayo, Duchess of Albany, Formosa, Hugo, Marion Hood, Miss Ramsbottom, Miss Roberts.

Hardy Narcissus.

THE Narcissus season is now closing in, and, so far as one can judge at present, has been a complete success. Apart from the newer varieties tried this year for the first time, there are several other points worth recording. It has been fairly tested and proved here that Irish-grown Narcissus are better ripened, and, in consequence, flower better than Holland-grown bulbs. The bulbs received from Ireland were not remarkable for size, but from most of them two flowers, and from many three flowers, were produced, and good flowers, too. This fact may be of use to those who force Narcissus largely, for complaints are common this year of the flowering of bulbs grown in Holland. As to the covering of late-planted bulbs, as heretofore advised, one point should have been emphasized more strongly, which is, that after planting it is absolutely necessary where field-mice abound, as they do here, to allow the frost to penetrate to the depth of two inches in the soil. This will keep the mice above ground, otherwise the Narcissus-bed would be a perfect paradise for them, with the covering of dry leaves to nest in.

One of the best of newer kinds tried this year is *N. bicolor præcox*. This is in flower with the earliest kinds, almost two weeks before *N. bicolor Horsfieldii*, and in shape and color is almost identical except that it is smaller; but one cannot have too many bicolored varieties, especially when they are as good as Grandee or Grandis, which is equal in every respect to

Horsefield's variety, and the one bulb gave us three perfect flowers. The perianth is pure white with a pale yellow trumpet, and the flower is of good substance. I had always thought that Empress and Emperor were tender and hard to keep, but with us they are the most vigorous, and the size and substance of their flowers are unsurpassed. Duchess de Brabant is one of the Eucharis-flowered section and is known as pure white, but there is a tinge of creamy yellow in the flowers, which are two or three on a stem. This is a very pretty variety, dwarf, and useful when cut. Of the Poet's Narcissus the earliest is the variety Angustifolius. It flowered ten days before Ornatus, the well-known early-forcing kind, and is equally as good in its way. The true variety, Pœtarum, is distinct, for, instead of the centre being margined with red, it is wholly of a deep orange-scarlet or saffron. We received a lot of other bulbs under this name which were nothing more than the *N. pœticus*, which is easily distinguished by the coloring of the cup.

Ard Righ, or Irish King, is a very early Trumpet variety, and forces well, and makes a better plant for this purpose than Trumpet Major. Countess of Annesley, also a Trumpet variety, is equal to Golden Spur, and very desirable. It was found in an old Irish garden, as were also many more charming kinds, where they have been hidden for years past, but have been hunted up since the development of what may be considered almost a craze for these flowers. Some of the newer sorts certificated at the London Conference last year command prices which testify to the demand for novelties of this sort among wealthy amateurs. Twenty-five dollars is the modest sum asked for one bulb, and if the flower is as good as described it may be as many years before it will be cheap or common; but this is an exceptional case. Good showy kinds can now be purchased of most dealers in fall, and even the cheapest are good to commence with, and then, again, some of the more expensive sorts are really cheap, they increase so rapidly. Sir Watkin, for instance, is one of the most profitable kinds ever introduced; where one bulb is planted three may be dug the following year, it multiplies so quickly by offsets. The depth at which to plant has been, and is still, a vexed question both here and abroad. Mr. Gerard takes exception to the depth recommended by me, and practiced very successfully in his own locality and in this, but the difference lies entirely in the nature of the soil, which with him is a red clay, while those with which I have had to deal have been of a sandy or gravelly nature, warm and dry in summer, and porous in winter. Had I his soil to deal with it would be necessary, perhaps, to plant differently and to leave the beds bare during summer, but here even the more delicate and even tender kinds do well under the treatment I have described in these columns.

European catalogues often add in their descriptions of Narcissus the dates at which they may be expected to bloom in the open ground. It need hardly be said that this is not of any use to us here, as when spring opens a week of difference there may become something less than a day here, but perhaps if they were grown in pots in cold frames there would be a greater interval between the kinds. Pot-culture, however, is scarcely to be recommended, as even when well grown in pots the plants become so drawn out of all character that it is very difficult to distinguish the varieties. Such was the case at the spring show of the Massachusetts Horticultural Society, and the same may be said of nearly all hardy plants, they lose one of their special charms, their hardiness.

S. Lancaster, Mass. *E. O. Orpet.*

Scilla hyacinthoides, after being grown in gardens some 200 years, would scarcely seem to need an introduction, yet as the Scilla season ends with its blooming in May, perhaps a word as to its value and beauty may cause it to be planted in places where it is now unknown. The white soft bulbs are entirely hardy, and increase rapidly, throwing up in the spring numerous long, narrow, prostrate leaves, and at this season a radical stem furnished with numerous small bell-shaped flowers. In the type these are light blue, but there are also white and rosy forms, both of which are attractive. The flower-stems are some six inches long and useful for cutting.

Trollius Europæus was one of the last hardy plants to bloom in November, and now the same plants are showing their beautiful golden globes. Very satisfactory yellows are their flowers—light yellows to orange in clear fine tones. These Globe-flowers seem of undoubted hardiness, and prefer rather damp places; in such locations they grow vigorously.

Aquilegia flabellata, the dwarf Japanese species, proves the earliest to bloom, leading *A. Sibirica*, and showing flower in April. It is scarcely a foot high and has short-spurred white flowers slightly shaded with violet. The other species and hybrids are rapidly developing and enlivening the borders with their gracefully poised flowers. Either for the border or for naturalizing in wild places there are few more satisfactory and enjoyable flowers than the Columbines, and few plants with a greater range of color and form. Perhaps there are rather too many purples, but on the whole the colors are very attractive. The confirmed hardy plantsman has his tradition that only the true species of Columbines are worth growing. 'Tis true that he is somewhat doubtful as to what may be the genuine type of some species, but he is sternly loyal to the principle. But those who simply enjoy beauty when they find it will be apt to find pleasure in the double and twisted hybrids which spring up through the garden from self-sown seed. The varieties of Columbines are endless since it is very difficult to prevent their crossing. Reliable seeds may be had of some species, however, and it is well to start with a selection of these. A good selection would be, say, *A. cærulea*, *A. chrysantha*, *A. alba grandiflora*, *A. truncata*, *A. glandulosa*, and *A. Canadensis*. It adds to the minor pleasures of the garden to grow the flowers of sentiment, and there seems to be some of this attached to the last-named species, which is our common wood Columbine. I notice that my friends who are old enough or frank enough not to be ashamed of emotion usually pause pensively at this variety, which leads me to infer that in days gone by a great many wild Columbines have been gathered in pleasant company.

Elizabeth, N. J. *J. N. G.*

Begonia semperflorens.—I have been much interested in noticing the hardy character of this Begonia for the past two seasons. On an elevated border, close under the south front of a long piazza in Raleigh, is a row of these Begonias. They are covered in the autumn with rough manure, and in the spring they start up again in full strength. I was at first inclined to think they came from seed, and some may do so, but I find that the fleshy bases of the stems survive. These plants are not tuberous, but the bases of the stems are stout, and are completely protected from our light frosts by the sheltered position in the dry border with the added cover of manure. During each summer the plants grow about two feet high, completely filling the open space between the ground and the floor of the piazza, and they are continually covered with bloom. I have been accustomed to see this Begonia growing as a weed, from seed, about old greenhouses, but had no idea before of its ability to survive out-of-doors.

The Satsuma Orange.—Last spring we planted on an open and exposed hill-top, at the North Carolina Experiment Station, two trees of the Japanese seedless Orange, known as the Satsuma. These small trees are grafted on the *Citrus trifoliata*. One of them was very puny and weak all summer, and we were not surprised to find that it lost its foliage and some wood. The other one did not lose a leaf, though no protection was given it. It is now making a firm new growth, and is in bloom. It seems probable, therefore, that we have here a sweet orange that can be grown a long way beyond the "Orange belt." The lowest temperature noted at the signal station in Raleigh during the past winter was, we believe, twenty-one degrees above zero; but these plants are on an exposed hill-top, fifty feet or more above the city, and must have had several degrees more of frost at times.

Celery-plants.—Celery-plants should be bought in May from those who make a specialty of growing them for sale on a large scale. At thinning time the young plants may be procured for one-third the price asked for them at the regular planting season, and by transplanting them two inches apart each way in a rich border, or, what is better, in a cold frame where a shade can be put over them, fine plants, in the best possible condition, are conveniently at hand when planting time comes. When only a moderate number of plants are needed, it is better to buy them in this way than to raise them from seed.

Raleigh, N. C. *W. F. Massey.*

The Forest.

Redwood Timber.

SOUTH of San Francisco Bay the only Redwood forest of any extent is that of the Santa Cruz Mountains. Compared with the northern belt this forest is small. Two railroads tap it, one piercing it through the centre. A great farming and fruit-growing community is close at hand, while much lumber goes to the cities on San Francisco Bay. With this demand it is a question of no great length of time when this forest will disappear.

North of San Francisco the first great forest is reached at the mouth of Russian River. Here is the southern border of that great Redwood forest which extends, without a break, through Sonoma, Mendocino, Humboldt, and Del Norte Counties, narrowing all the time until it ceases near the Oregon line. On the Russian River were some of the finest Redwoods on the coast. Accurate figures of the yield of Redwood forest per acre are hard to obtain, but here, at Guerneville, Mr. Guerne, the principal mill-owner, cut 24,000,000 feet of Redwood lumber, of first and second quality, from 160 acres, an average actual output of 150,000 board feet per acre. Mr. Guerne paid $2.50 per 1,000 stumpage, or $60,000 for the 160 acres. It is probable that this is as large an amount of redwood as has ever been cut on an equal area. Even at Guerneville, famous as it was for fine timber, there were not over 500 acres of timber approaching this productiveness, while of the Redwood lands remaining uncut now, such quarter sections as will yield 50,000 board feet per acre are considered exceptionally good.

North of the Russian River the Redwood forest widens, reaching its greatest width of twenty-two miles at a point west of Ukiah, Mendocino County. This section is one of very steep mountains and deep cañons, and nearly all of the Redwoods are on the rugged slopes, which even a good mountaineer would consider hard climbing. The river-bottoms or flats are insignificant throughout this region, and a forty-acre piece of level or nearly level land is unusual, and can only be found in narrow strips from which rise the steep, wooded hills. The streams, after a short course, at most forty or fifty miles, flow into the ocean, with deeply cut tidal estuaries. With reasonable accuracy it can be said the entire Redwood belt is included within the basins of these streams. At the mouth of nearly every considerable stream a saw-mill is located. The cutting capacity of the sixteen Mendocino County mills varies from 30,000 to 100,000 feet per day. The mill companies own Redwood lands at different portions of the river-courses. Logging is done at various places during summer, and the logs are rolled into the dry channels to await the winter floods, or, where the tide runs up a river, they are floated directly to the mill. Railroads are also built up the cañons, and make some of the mills independent of high water. These railroads are standard gauge, and from five to fifteen miles in length, and nearly every large mill company has its railroad, which is extended as the timber is cut. Spurs from the main roads are run up lateral cañons, so that the haul by oxen is shortened, and it is all down-hill.

The mills find easy shipping facilities from either a wharf, where the river has no bar, or by chutes, which are, perhaps, peculiar to this high, rock-bound coast. From some bluff a trestle-wharf is thrown to a rock adjacent to deep water, high above the surf. From the end of this wharf an inclined way slants to the deck of the vessel. This slide is upheld by a sort of derrick, and can be lowered to the vessel or raised out of the reach of the waves. The lumber is let down this chute piece by piece, a breaker at the bottom stopping the headway. A line of men stow it away. Passengers and freight are loaded or unloaded by way of these chutes. Steam schooners, of a capacity of 200,000 to 300,000 feet, do most of the carrying trade. On about 100 miles of coast-line belonging to Mendocino County there are twenty-three chutes and ports. In times of extensive railroad-building the Redwood region is the scene of a great railroad-tie industry, and millions are hewn. For this work only the best splitting trees are used, and waste is great. The ties are nearly all cut from the higher ridges and mountains, and hauled by wagon to the coast. Great quantities of the finest timber have thus been cut and half-used. Even in ordinary times no inconsiderable number of ties and posts is cut, and the ridges are cleared far in advance of the operations of the saw-mills.

Northward from Mendocino County the next lumbering centre is at Humboldt Bay, where the output of eight large saw-mills, each cutting from 40,000 to 80,000 a day, is shipped. More of the forest in this region is on flats and lighter slopes, and will average one-third heavier than the Mendocino woods. The last port from which redwood is shipped is Crescent City, near the Oregon line.

The total area of Redwood lands is about 1,450,000 acres, of which five per cent., perhaps, has been cut. The average net yield per acre of redwood under the saw is not easily arrived at, since scaling standing trees will, of course, give gross returns of yield. Such figures are of little practical value, on account of a large percentage of loss by breakage in felling and from unsound trees. This liability to loss is much larger proportionately in very heavy timber, so much so that experts dislike to figure on heavy timber. The most accurate figures I have been able to get are based on estimates made by scaling tree by tree, and rectifying the result by comparison with actual returns from the saw of timber so scaled previously. In other words, not the amount of timber standing on an acre, but the amount which can be actually taken off in merchantable grades. All figures are in board feet. It is to be remembered that, as there is no market for wood or for short lengths, the amount of waste on heavy lands is very large. The Redwood is very brittle, and often a tree shatters into short lengths when felled. By these measurements we find that a very good quality of hill-land will cut 50,000 per acre, with perhaps 35,000 as an all-around average for Redwood lands. Single acres may be scaled which will figure prodigious quantities. In one instance an acre was picked on what is known as the Montgomery tract, near Hot Springs, Mendocino County, which is a narrow creek-flat of perhaps forty acres, and considered the finest small piece in Mendocino County. On the acre selected there were forty-seven trees which would probably cut 1,500,000 feet of sawed lumber.

Not far from here a tree actually cut 49,500 feet of good lumber. At Westport a considerable area of what is considered excellent Redwood, cut 57,000 feet an acre. On Humboldt Bay as high as 250,000 an acre has been cut, but only on limited areas.

Ukiah, Cal. *Carl Purdy.*

Correspondence.

Wild Asparagus.

To the Editor of Garden and Forest:

Sir,—In a recent journey along the shores of Chesapeake Bay I observed that the wild Asparagus which is found growing along the sandy beaches of that region is used quite extensively. The young tops are collected and bunched for sale, and by some are preferred to the cultivated plants, although only the tips are soft enough to be eaten. In his "Field, Forest and Garden Botany," Gray notes that it is "spontaneous about gardens," and in the last edition of his manual it is called "frequent escape from gardens." It grows so abundantly along the western and southern shores of Maryland that it seems to justify the use of the term "naturalized." I observed it also a mile or two inland along the borders of the woods. I find a record of the use of "Sparagus" in "A Perfect Description of Virginia" (1649, p. 4). As a justification for the preference of the wild Asparagus over the cultivated plant, Pomponius, a Roman writer of the second century, says: "Duo genera asparagi, hortense et silvestre, sed incultum gratius est, quod Corrudam."

Framingham, Mass. *E. Lewis Sturtevant.*

Water in "Pot-holes."

To the Editor of Garden and Forest:

Sir,—In your column of notes, page 204, I am quoted as saying that cutting away timber causes more rapid accumulation of water in "pot-holes." What I did say was, that on denuded land there is a more rapid accumulation of water in these hollows. Cutting is not denudation, nor does denudation necessarily follow cutting. In the case observed there had been no cutting within twenty miles.

Washington, D. C. *H. B. Ayres.*

Watering Trees.

To the Editor of Garden and Forest:

Sir,—I am much interested in a large Oak-tree which we moved last autumn. The soil is very dry now, and I wish you would tell me whether the tree should be thoroughly watered and mulched. There seems to be a difference of opinion as to the benefits to be derived from watering at this season of the year.

Ayer, Mass. *E. L.*

[A tree moved last autumn, and therefore with roots which are still working imperfectly, would be greatly benefited, probably, by a thorough watering if the ground is dry, as it is in almost all parts of the country this spring. One thorough watering is better than half a dozen partial ones, however, it must be remembered. The best plan in such cases is to make a dish about the stem of the tree two or three feet wide, by drawing the loam back with a rake, and then fill this basin with water. When the water is all soaked away it can be filled again, and this can be done

two or three times, until the soil in the neighborhood of the tree is thoroughly soaked. Five or six barrels of water would not be too much for a tree fifteen or twenty feet high. After the water has all soaked away the basin should be filled by drawing the soil back, and then the surface of the ground should be thoroughly mulched with a coating of leaves, hay or grass five or six inches thick, and extending out from the trunk several feet. This mulch had best be left about the tree all summer to check evaporation from the ground. A band of straw tied round the trunk will protect it from the sun, and is often beneficial to newly transplanted trees.—Ed.]

On the Names of Some North American Trees.

To the Editor of Garden and Forest:

Sir,—With respect to the Florida and West Indian "Marlberry," which Nuttall described as *Ardisia Pickeringia* ("Sylva," iii., 69, t. 102) in 1854, it appears upon late investigation that a change becomes necessary both in its generic and specific name.

The genus Ardisia, in which this plant has been maintained during the last twenty-five years, was established by Swartz ("Prodromus Flora Indiæ Occidentalis," i., 467, t. 10) in 1797, but this, it seems, must give way to Thunberg's older genus, Bladhia, established in 1781.

The first description of the Marlberry was published by Nuttall, in the *Am. Journ. Sc.* (v., 290), under the name of *Cyrilla paniculata*, in 1822; he next published it as *Pickeringia paniculata* in 1834 (*Journ. Phila. Acad. Sc.*, vii., Pt. 1, 95), and finally described and figured it ("Sylva," iii., 69, t. 102) as *Ardisia Pickeringia* in 1854.

The oldest specific name applied to this plant is therefore *paniculata*, published in 1822; but in calling Professor Sargent's attention to the desirability of resuming this name, he suggested to me the existence of an *Ardisia paniculata* published by Roxburgh ("Hortus Bengalensis," 16) in 1814, which would, of course, preclude the employment of *paniculata* for our species. A suspicion, however, that Roxburgh's name was not founded on a description, led to further investigation and the discovery that no description was published in the "Hortus Bengalensis," therefore making *paniculata* untenable for Roxburgh's plant, and open to use for our Marlberry, as Roxburgh did not properly establish *A. paniculata* until 1824 ("Flora Indica," ii., 270).

Referring our species to its oldest genus under the oldest specific term, the plant becomes *Bladhia paniculata* (Nutt.) (= *Cyrilla paniculata*, Nutt., l. c., 1822; *Pickeringia paniculata*, Nutt., l. c., 1834; *Ardisia Pickeringia*, Nutt., l. c., 1854).

Respecting the author of *Ardisia Pickeringia*, there appears to have been a difference of opinion, some citing Torrey & Gray, and others Nuttall. I believe, however, that Professor Sargent ("Census Cat. For. Trees," 100) was correct in ascribing it to Nuttall (l. c.)

The only author before this who quotes Nuttall for this combination is Cooper (Smithsonian Rep., 1858, 264) though he gives "*A. Pickeringii*, Nutt.," while Nuttall wrote "*A. Pickeringia*"; Cooper may not, however, have intended to change Nuttall's name.

But DeCandolle ("Prodr.," viii., 124), Chapman ("Fl. So. States," 277), Vasey ("Cat. For. Trees," 19), Gray ("Syn. Fl.," ii., l. 65), Hemsley ("Biol. Am. Cent.," ii., 294), all cite Torrey & Gray for *A. Pickeringia*, which is doubtless incorrect, as of Sprengel ("Syst. Veg.," ii., 268), who restored Linnæus' the "Flora N. A." contains, as I take it, no such announcement.

The only reference made to this species in the above work is in a note (i., 256), "*Pickeringia*, Nutt. (*Cyrilla paniculata*, Nutt.) . . . is a species of Ardisia; probably *A. coriacea*, Swartz. . . ." Certainly *A. Pickeringia* could not be properly ascribed to Torrey & Gray on this evidence, and should, therefore, not be so maintained in the synonymy of this plant as a name originating with the above authors.

Persea Carolinensis, Nees.—The synonymy of the Red Bay, a tree which occurs from Virginia to Florida and westward through the Gulf states to Texas, presents some interesting features, aside from the fact that Catesby's specific name, *Carolinensis*, so long maintained, is hardly the one which the plant should now bear.

The first description and figure of this species appears to have been published by Catesby in his "Natural History of Carolina and the Bahama Islands" (i., 63, t. 63), in 1731. But Linnæus, in subsequently studying this plant, seems to have ignored Catesby's name, for he designated it in his "Species Plantarum" (ed. i., 370, 1753) as *Laurus Borbonia*, citing Catesby's name as a synonym, a fact which is of more significance in determining that Linnæus and Catesby described the same plant, than can be drawn from the former's description (l. c.), as this diagnosis gives only in part the characters of the species. The locality given by Linnæus, "Virginia and Carolina," though circumstantial, is additional and legitimate evidence in support of the authenticity of the Linnæan name.

Writers succeeding Linnæus have, nevertheless, chosen to follow and maintain Catesby's name down to the present time, the only exception to the general agreement being in the case name in 1825, referring the plant to its present genus as *Persea Borbonia*. And in the light of present evidence, therefore, it seems advisable that Sprengel should be followed, as there can be no doubt but that the Linnæan name is sufficiently authenticated, and should, therefore, be maintained, in which case *Persea Carolinensis*, Nees, becomes *Persea Borbonia* (Linn.), Spreng.

It should be added, although unknown to me until now, that Professor Sargent had already taken up *Persea Borbonia* for the Red Bay, as he informs me, having changed last year the name in the Jesup collection of American Woods.

It is further of interest to note that the name *Laurus Carolinensis*, founded on Catesby's publication (l. c.) in 1731, and commonly placed in the synonymy of this plant, cannot be longer maintained in this position, as it antedates the Linnæan starting-point for specific names. The reference is, however, of historical interest, and may therefore be properly preserved, though in another connection. *Laurus Carolinensis*, of post-Linnæan synonymy, must take its date from the second edition of Catesby's work, published in 1754.

Forestry Division, *George B. Sudworth.*
U. S. Department of Agriculture.

Recent Publications.

A second edition of the *Catalogue of the Flowering Plants and Cryptogams*, and a list of the vertebrate animals found within about thirty miles of Hanover, New Hampshire, including a few cultivated species, has been issued by Henry G. Jesup, professor of natural history in Dartmouth College, the first edition having appeared in 1882. The region is an interesting one, embracing the mountain peaks Moosilauke and Kearsarge in New Hampshire, and Killington in Vermont. It includes several large sheets of water, and is divided by the Connecticut River. It is, therefore, a fairly representative region of northern New England, and, with the exception of the alpine plants found on the high mountains and the literal plants of the sea-coast, contains a large representation of the New England flora.

"Thirty miles south of Hanover," Mr. Jesup tells us, in his introduction, "in the towns of Charlestown, New Hampshire, and Springfield, Vermont, some trees and shrubs, so common a little further south in both of these states, have already reached their northern limit and begin to disappear from the native woods. The Chestnut and the Shagbark Hickory are no longer abundant. The season is too short for any considerable quantity of fruit to reach perfection, and seedlings are rare. Trees of these two kinds when planted in sheltered localities may attain considerable age and size. A single Chestnut of exceptional size may be seen in Norwich, Vermont, five feet eight inches in diameter, and more than fifty years old, but it was planted where it now stands, and the chestnuts are of little value. An occasional Shagbark Hickory of moderate size may also be met with, though the Pignut Hickory is not infrequent in the woods, and the Bitternut Hickory ascends the Connecticut as far north as Wells River. The Black Birch and the Gray Birch, as well as the Pitch Pine, are rare north of Hanover and not common in its vicinity, while the Sycamore or Buttonwood is nowhere seen in a wild state. To the above may be added, as decidedly rare, the Sassafras, the Spice Bush, the Flowering Dogwood, the Red Cedar and the common Juniper, together with many other trees and shrubs that fifty miles south of Hanover may be common.

"On the other hand, as the traveler advances thirty miles northward from Hanover, another class of arborescent vegetation appears that either is not found at all southward, or at least is not abundant. Here the White Cedar becomes plentiful and very valuable, the Tamarack, or American Larch, fills the swamps, and the White Spruce occasionally appears, while the Black Spruce covers the lower mountain-tops, the Paper Birch adorns the hillsides, the Green Alder is found by

the streams and in the ravines, and the Elder has red berries more commonly than black ones."

The arrangement of genera and species and the nomenclature is that adopted in the latest edition of Gray's "Manual of the Northern States."

Notes.

The first cherries of the season arrived in New York about May 12th. They came from San Jose, California, and were retailed at $1.25 a pound.

The Earl of Gosford, a member of the British House of Lords, has purchased an entire section of land (640 acres) near Bakersfield, Kern County, California, and has begun to plant it with Grape-vines, Peaches and Pears.

A large part of the shore of the picturesque harbor of Sydney, Australia, is already laid out in parks and botanical gardens. Now it is announced that the Government, wisely intent upon preserving as far as possible the beauty of the bay, will take possession of all the islands still unoccupied and devote them to ornamental plantations.

"Perfumes," wrote Heinrich Heine, "are the feelings of flowers; and as the human heart feels most powerful emotions in the night, when it believes itself to be alone and unperceived, so also do the flowers, soft-minded, yet ashamed, appear to wait for concealing darkness, that they may give themselves wholly up to their feelings, and breathe them out in sweet odors."

Part I. of the thirteenth volume of the "Journal of the Royal Horticultural Society" has reached us. It contains papers on the Dahlia, the Grape, on Trees and Shrubs for large towns, on Chinese Primulas, on cultivated Ferns, and other subjects of great and immediate interest to horticulturists, and shows the vitality and usefulness of the Royal Society, which has never done better work than it is doing to-day.

When the votes for a "state flower" were cast by the school-children of New York a year ago the Golden-rod proved the favorite, with the Rose so close a second that another ballot, confined to these two flowers, was thought desirable. This has just been taken in fifty-three public schools; 22,945 children voted for the Rose, and 25,360 for the Golden-rod, which thus becomes the emblem of New York state.

The leaves of *Salvia triloba* are extensively used in the Levant in the preparation of a kind of tea. The plants are simply cut, dried, tied in bundles and sold on the market-place, and are found, ready for use, in every café of Greece, and even in the poorest homes. This "Athenian tea," or, as the Greeks call it, "Phaskomylia tea," is believed to be a sure preventive of colds and fevers, and is therefore universally drunk in winter weather and by sailors at sea.

"In 1873," says a writer in the *Evening Post*, "the government of Assam began to cultivate the India-rubber-tree in the humid forests of Charduar, at the foot of the Himalayas. It was found best to propagate from seedlings, which were planted in the forks of trees, and by 1885 they had reached the ground. The trees were subsequently planted in beds forty feet wide, amid the surrounding forest, which sheltered them. Last year the plantation comprised 1,106 acres, and contained 16,054 healthy plants, besides 84,000 seedlings."

In his "English Flower Garden," Mr. H. A. Bright well says: "One of the greatest ornaments to a garden is a fountain, but many fountains are curiously ineffective. A fountain is most beautiful when it leaps high into the air and you can see it against a background of green foliage. To place a fountain among low flower-beds and then to substitute small fancy jets that take the shape of a cup, or trickle over into a basin of gold-fish, or toy with a gilded ball is to do all that is possible to degrade it. The real charm of a fountain is when you come upon it in some little glassy glade of the 'pleasaunce,' where it seems as though it sought, in the strong rush of its waters, to vie with the tall boles of the forest-trees that surround it."

The *Illustrirte Gartenzeitung* of Vienna says: "White fruits are rather rare in nature, and in this country are represented almost solely by those of *Symphoricarpus racemosus*. Variations into white from the usual red, blue or yellow fruit-colors do, indeed, occur in cherries, plums, raspberries, blackberries, whortleberries, gooseberries, strawberries, tomatoes, privet-berries and other fruits; but they almost always show a tint which is not pure white, but is tinged with the original green, yellow or red. The establishment of L. Van Houtte, Senior, has, however, produced a variety of the common Elder with pure white fruit. The originators say that the plant is vigorous in habit, and bears fruit freely; that this fruit is not only pure white, but translucent like white currants, and that a delicious preserve may be made from it."

According to an account in one of our daily journals, an association of women has been formed in London for the purpose of contracting for the care of city conservatories, window-boxes, balconies and small urban gardens. "It will personally supply and superintend all orders, employing men only for the digging. Once a week one of the lady-gardeners will call to attend to the conservatories, valuable plants in rooms, etc., and leave orders for what is to be done until she comes again. People wishing to close their town homes leave their plants in the charge of the ladies. Swanley Horticultural College is to open a ladies' department, so popular is this work becoming among women, when the women will occupy a separate residence, and devote the days to theoretical and practical work."

The Secretary of the Parisian Chambre Syndicale des Horticulteurs (which may be translated Florists' Board of Trade) recently declared that many of the four hundred gardeners who supply the flower-markets of Paris have been ruined by the exceptional severity of the past winter. Fifty Rose-growers, he declares, have lost about a million francs because they could not house their plants quickly enough on the sudden advent of frost. One hundred and fifty gardeners who make a specialty of hardy flowers, such as Pansies and Gilly-flowers, have lost their entire stock; and the loss of those who furnish pot-plants, or the cut flowers of such plants, is estimated at 800,000 or 900,000 francs. About 6,000 other gardeners, living in the departments of the Seine and of the Seine-and-Oise, have likewise greatly suffered. In general the damage has been much greater than even during the famous winter of 1870-71, for then the excessive cold did not extend to the western and southern parts of the country.

"Variations of flowers," wrote Leigh Hunt, in an essay called *A Flower for your Window*, "are like variations in music, often beautiful as such, but almost always inferior to the theme on which they are founded—the original air. And the rule holds good in beds of flowers, if they be not very large, or in any other small assemblage of them; nay, the largest bed will look well, if of one beautiful color, while the most beautiful varieties may be inharmoniously mixed up. Contrast is a good thing but we should first get a good sense of the thing to be contrasted, and we shall find this preferable to the contrast if we are not rich enough to have both in due measure. We do not, in general, love and honor any one single color enough, and we are instinctively struck with a conviction to this effect when we see it abundantly set forth. The other day we saw a little garden-wall completely covered with Nasturtiums and felt how much more beautiful it was than if anything had been mixed with it, for the leaves, and the light and shade, offer variety enough. The rest is all richness and simplicity united—which is the triumph of an intense perception. Embower a cottage thickly and completely with Roses and nobody would desire the interference of another plant."

The April issue of Hooker's *Icones Plantarum*, being part third of the twenty-second volume, contains figures and descriptions of a number of plants of extraordinary interest, including a new Chinese Rubus; a Magnolia-like tree from Hong-Kong, Mangalietia, the first record that this genus is represented in China; *Eperua Jenmani*, a fine leguminous tree from British Guiana furnishing timber, and from the root a remedy for the toothache; *Ligusticum Sinense*, one of the sources of the Chinese drug known as Kao-pên; *Nyssa Sinensis*, an interesting addition to a genus known before only in North America, where several species occur, and in the Himalaya, where one is known. This Chinese Gum-tree differs from its allies in the pedicellate ovaries. *Dalbergia Hupeana;* this is the T'an-tree of the central provinces of China, and is common in Hupeh "in the flat country, and its wood, being hard and durable, is much used in making rammers for oil-presses, wheel-spokes, tool-handles, and the blocks and pulleys used on the native craft." *Buddleia officinalis*, one of the sources of the Chinese drug known as mêng-hua; it is common about Ichang. *Inula racemosa*, a very fine species from the western Himalaya and China, where it is cultivated as a drug and as a substitute for the root of *Aplotaxis auriculata*, which is so largely imported into China by way of Calcutta and Bombay from Cashmere.

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The Swamp White Oak.

IN eastern North America there is a peculiar group of Oaks known generally as Chestnut Oaks on account of the fancied resemblance of the leaves of one of their number to those of the Chestnut-tree. They are White Oaks, that is, they belong to the section of the genus in which the fruit matures in one season; and they all have coarsely sinuately-lobed leaves, more or less pubescent and white on the lower surface, and, with one exception, pale, scaly bark. The exception is the Rock Chestnut Oak, which grows on the dry banks of streams and in dry upland forests; on this tree the bark is deeply divided into broad rounded ridges, and is dark-colored like the ordinary bark of Black Oaks. The cup of the fruit of the Chestnut Oak is hemispherical, usually hoary, and encloses nearly one-half of the large oblong acorn, which is sweet and more palatable than the fruit of other American Oaks.

The upland Chestnut Oak was known to Linnæus, who called it *Quercus Prinus;* the elder Michaux, who studied our eastern Oaks conscientiously, and published, or, at least, supplied, the material for an admirable book about them, knew all the Chestnut Oaks. He considered them forms of the Linnæan species, and in all the old works on American trees they are spoken of as varieties of that species. Two of the Chestnut Oaks grow in low, wet situations, near the borders of swamps or pond-holes, and, although they do not grow naturally in swamps, are usually known as Swamp White Oaks. One of these trees belongs to the north, where it is found from Canada to the Potomac and along the mountains as far north as northern Georgia, and from the Atlantic sea-coast to Iowa and Missouri. This is the tree which botanists now generally call *Quercus bicolor;* it is represented or replaced in the south by a larger and finer tree, one of the noblest and most beautiful of the deciduous trees of eastern North America, a second species of Swamp White Oak—the *Quercus Michauxii.* This statement needs, perhaps, some qualification. Extreme forms of the northern, and of the southern, Swamp Oaks are distinct enough, but in the region where the two species mingle—in southern Delaware and in Virginia—it is not so easy to distinguish them, and one appears to pass gradually into the other. These intermediate forms led Dr. Englemann, the most careful student of American Oaks we have ever had, to believe that the two trees should be regarded as varieties of one species. But this is a subject which need not be discussed at this time, our object now being to call attention to the beauty and value of the northern tree as a good subject for care when it is found growing naturally, or for cultivation where proper conditions can be supplied for it.

The Swamp White Oak in its young state, and until it has reached the height of twenty or thirty feet, develops short, rather stout, branches, which grow almost at right angles with the stem, and form a narrow, formally pyramidal head; as the individual grows older the formal habit is generally lost, and an irregularly spreading top is developed, which is broad or narrow, as it has abundant or scanty room in which to enlarge. The lower branches, in its youth at least, are remarkably persistent and generally pendulous on this tree, or intricately contorted toward their extremities. This habit is well shown in the portrait (see page 246) of a tree thirty or forty years old, made in Massachusetts in winter by Dr. William H. Rollins, to whom we are indebted for the privilege of publishing it. The bark of young trees separates into large, thin, brown, papery scales, which remain for a long time on the trunk and branches, and give them a ragged appearance which other young Oaks do not present. The pendulous habit of the branches and this peculiarity of the bark make the Swamp White Oak, as long as it is young, one of the easiest of all our trees to recognize in winter. The bark of large trees is rough, with thick, pale, flaky scales not very unlike those of the White Oak, although usually rather darker-colored.

In summer the Swamp White Oak is easily recognized by the leaves. These are oblong or oblong-ovate, with a narrow wedge-shaped base and are very coarsely crenately-serrate, especially above the middle, where there is often, on each side, a deep sinus; they are six or eight inches long and three or four inches broad, and are smooth and dark green on the upper surface and pale or sometimes nearly white on the lower surface, which is covered usually with fine pubescence. The foliage of no other Oak of the northern states is more beautiful. When the leaves unfold, the upper surface is sometimes pale and sometimes bright red, and the lower surface is thickly coated with white tomentum. The contrast between the colors of the upper and of the lower surfaces of the young leaves makes the Swamp White Oak a delightful object in early May, when the branches are draped with the long catkins of staminate flowers. It is hardly less beautiful in summer, when the wind plays through the foliage and turns to the light first the pale under-surface of the ample leaves and then displays the dark green and glossy covering of their upper surface. In autumn, just before falling, the leaves turn yellowish brown and never assume the brilliant colors put on by many of the Oaks of eastern America. The fruit, which is not produced very abundantly, is borne singly or in pairs on stalks two or three inches long and much longer than the leaf-stems. The upper scales of the cup are pointed and sometimes form a delicate fringe-like margin; the acorn is an inch long, rather obtuse and bright chestnut-brown when ripe. Squirrels and hogs find it to their liking, and a man, if he was very hungry indeed, might get some satisfaction from eating it; it is not as sweet and much less palatable than the acorn of the southern Swamp Oak.

The wood of the Swamp White Oak is perhaps even more valuable than that of the White Oak; it is hard, strong, close-grained, very tough, and is not distinguished from White Oak by timber merchants. The two woods are used for the same purposes.

The Swamp White Oak is a common tree in some parts of the country, especially in eastern New England and in New Jersey, and in some parts of Pennsylvania. It is found usually with the Swamp Maples and the Tupelo, the White Ash and the Shellbark Hickory, and south of New England with the Pin Oak (*Quercus palustris*) and the Liquidambar. It grows occasionally to a great size. Individuals, a hundred feet high, with trunks seven or eight feet in diameter, can be found; such specimens are rare, however, and it is not usual to see this tree more than half this size. The greatest Swamp White Oak of which any record has been preserved is known as "The Wadsworth Oak." It stood on the intervale of the Genesee River in western New York, on the Wadsworth estate, where many large Swamp Oaks still exist. Mr. S. B. Buckley published, many years ago, a note on this tree in the *American Journal of Science and Arts*, from which it appears that in July, 1851, when he visited it, the trunk varied little in size from the ground to the branches, and that it had an average circumference of twenty-seven feet. Its smallest circumference was twenty-four feet. "It was situated in a pasture, and the ground was bare and hard beneath it from the tramping of cattle and visitors. The big tree seems fated soon to die." The prediction, unfortunately, came true, and a few years later this tree, the pride of all the country round, was undermined and washed away by the gradual changing of the bed of the river near whose banks it had stood for centuries.

The Swamp White Oak is rarely planted. It bears transplanting, however, better than most White Oaks, and comparatively large specimens can be moved if care is taken in the operation. It is better, however, as it is in the case of all White Oaks, to plant the acorn or a small seedling where the tree is to grow permanently. Transferred to upland the Swamp White Oak grows rapidly and thriftily, although it is not probable that it will make a very large or long-lived tree, except in deep, moist soil in the neighborhood of streams or swamps. When such positions are available there is no better tree to plant, and when the Swamp White Oak is found growing naturally it will repay the small amount of care and labor required in cutting away any less valuable trees which encroach upon it and interfere with its characteristic development.

The western Arbor-vitæ, of which a portrait was published in these columns a few weeks ago, seems destined to disappear from the face of the earth if the shingles made from the wood of this tree continue to grow in popularity as rapidly as they have in the last two or three years. Nearly a hundred mills devoted exclusively to making shingles from the Red Cedar, as the western Arbor-vitæ is called, have recently been erected in western Oregon, and large quantities of the shingles are manufactured also by hand and by machines attached to saw-mills. It has been found that these shingles are very durable, and that practically the action of the elements alone has little effect on them; and they are now supplanting the Pine shingle of Michigan, the Cypress shingle of the south and the Redwood shingle of California. They are sent all over the United States, the transcontinental traffic companies fostering the industry by advantageous rates; and large numbers, especially those made by hand, are sent to the Hawaiian Islands and to other Pacific ports.

The combined daily product of the fifty shingle-mills controlled by the Northern Pacific Consolidated Shingle Company is said to be 3,500,000 shingles, and probably as many more are made from this wood in Oregon and Washington by individuals and in mills uncontrolled by this company. The supply of this timber is still large, but the region where the western Arbor-vitæ flourishes is not extensive, and it is only a matter of time when the last of these trees will have fallen under the axe of the timber-cutter.

Ivy in an Old French Garden.

THE article recently published in these pages, on the Renaissance Colonnade in the Parc Monceau, may well have recalled to many readers memories of other French parks and gardens where Ivy is most beautifully used. One such picture is especially vivid in my own mind, although it was received in the immediate vicinity of the great cathedral of Chartres, where, one might easily suppose, architectural pictures would crowd out all besides.

When we stand in front of the splendid sculptured porch which furnishes the north transept of the cathedral we have a glimpse off to the left, through a huge ornamental iron gate, of a garden shadowed by lofty graceful trees. Perhaps it is not always possible to pass this barrier, for we were told that the Bishop, who had recently died, was old and cross, and permitted no one to come within sight of the windows of his palace. But when we were at Chartres this unchristian Bishop, fortunately, was dead, and his successor had not yet arrived. So we got into the garden, not, indeed, through the gate of honor, but by a little side entrance at the further end, near the south-east corner of the church. Entering at this point, however, our first view of the quaint, delicious, out-of-the-world spot was all the more delightful.

The garden forms a long narrow rectangle, lying, like the cathedral and the streets beyond it, high above the more eastern portions of the town. At the end where we stood, and all along the eastern side, one looked over a stone parapet far down a massive wall into streets and court-yards, and far above picturesque masses of roofs and a winding little river to the distant hills. Above the other side, to the west, towered the apse of a great chapel which is attached to the end of the cathedral; and at the further end of the garden stretched the white façade of the episcopal palace, with a terrace running in front of it, a few beds of flowers close beneath, and long rows of clipped shrubs in pots. And this was seen between two rows of great ancient trees, whose branches almost met overhead and whose trunks were almost concealed by thick shrubberies, while all the space between them was filled by a quiet expanse of grass. The paths which lead from one end of the garden to the other lie outside these trees and shrubberies, close to the parapet on the one side and close to the chapel on the other. No line of gravel or bed of flowers breaks the harmonious simplicity of the central area. The trees are not planted with formal regularity, though the canopy of their foliage has become uniform and symmetrical; and one almost forgave the selfish isolation of the defunct Bishop, reflecting that, perhaps, had he cared more for company, he would have instructed his gardener to trim up the shrubs which now grew in beautiful luxuriance, trailing their branches on the rather rankly growing grass. It was a picture of the utmost beauty, and if it looked as though no human hand had touched it for many years, this only increased its poetical charm and added that touch of pathos which always seems to befit the neighborhood of a great ancient church.

But what I wanted especially to explain was, that the final finishing touch of beauty was given by the luxuriance of the Ivy which ran riot in almost every part of the garden, yet in its wildest freaks seemed to have been guided by the hand of some non-human artist. It clambered up the trunks of the great trees until it clambered out of sight among their own foliage. It wove each trunk to the stems of the shrubs beneath it, and then it ran out in long festoons and streamers amid the grass until it was impossible to say where the shrubberies ended, where the lawn began. Beautiful, indeed, were the graceful garlands it wove, and beautiful the contrast of their dark shining green with the paler green of the shrubs and the grass. Admiration changed at last to envy, thinking what one would give in an American country home for a growth of Ivy like this, planted, perhaps, a hundred years ago (I should imagine this to be about the age of the garden, as it is not formal in design), and growing since with only shade, dampness and a fertile soil to dictate its course. One felt that such a place as this ought to be seen, to be enjoyed, to be used. And yet, had it always been used and enjoyed, had its most recent owner been something different from a nervous, ecclesiastical recluse, would its pathetic loveliness have so enchanted the eyes of our lucky band of tourists?

New York. *M. G. Van Rensselaer.*

In those vernal seasons of the year when the air is calm and pleasant, it were an injury and a sullenness against Nature not to go out and see her riches, and partake in her rejoicing with heaven and earth.

John Milton.

Native Shrubs of California.—V.

ALTHOUGH the cultivated Cherries, natives of the Old World, thrive better on the Pacific than on the Atlantic slope of our continent, the Atlantic side is richer in native species, for while, between Canada and the Carolinas, as many as seven or eight kinds of wild Cherries are indigenous, an equal extent of Pacific coast territory yields but four or five, and all of these are found within the limits of California. *Cerasus emarginata*, Dougl. (Hook. "Fl. Bor., Am.," i., 169), our best native type of the Cherry genus, is, however, limited in California to the northern counties, and even there fails to attain those tree-like dimensions and that symmetry of outline which it develops in the wooded country of Oregon and Washington. But, whether great or small, the species nowhere degenerates into a scraggy or shapeless bush. Seldom less than fifteen feet high, the branches are ascending, and the general outline of the head is more or less conical. The very finest specimens of this species which I have seen are on one of the streets of Portland, Oregon, where they were planted years ago for shade and ornament. Some of these are about forty feet high, and are so much like the cultivated Cherry-tree in foliage and form that I should perhaps have passed them by as exotic trees had not the ground beneath been strewn with the fallen fruit, which revealed at a glance the native species. The fruits are small for true cherries, of a dark dull red, and intensely bitter. The flowers are borne in umbels, but are small. At Lake Pend d'Oreille, in north-eastern Idaho, where, in a somewhat reduced state, the species is common, I observed that many of the flowers had been bipistillate, and that the drupes were often two to each flower; a circumstance, perhaps, not rare in cultivated Cherries, but which, occurring spontaneously in a wild tree of western America, cannot but suggest a still closer relationship between our western Cherries and their curious relative, the Oso Berry (Nuttallia), in which the drupes are normally from two to five to the flower.

Some years ago Dr. Kellogg, under a misunderstanding, made a synonym for the species, calling it *C. glandulosa*. He had been taught by authority that the following, much more common in California, was the true *C. emarginata:*

Cerasus Californica, Greene ("Fl. Fr.," 50). A mere shrub of unsymmetrical habit, often six or eight feet high, with a very smooth and shining brown and dotted bark; it is entirely distinct from *C. emarginata* in size, habit, and, more particularly, by the characters of its foliage. Its fruit is very small, of a clear and almost translucent bright scarlet, the flesh so keenly bitter—the bitterness so penetrating and permanent in one's organs of taste—that no one is likely to make a second experimental test of its qualities. The bush is common in middle California, among the hills of the coast range and of the Sierra, extending northward beyond Mount Shasta.

Cerasus demissa, Nutt. (Torr. and Gray, "Fl.," i., 411). This, the western Choke Cherry, very nearly allied to the Atlantic coast shrub or tree known as Choke Cherry, is not very prevalent in many parts of California. The acidulous fruit, hanging in somewhat inviting rich red racemes, is astringent when fresh; but cooking dispels this unpleasant quality, and a marmalade, entirely palatable, with a fine cherry flavor, is commonly made from it in most places where it is at all plentiful.

Cerasus ilicifolia, Nutt. (Hook. & Arn. "Bot. Beech.," 340). We seem to have on the American continent only two representatives of the Old World Laurel-cherry group of trees. *C. Caroliniana* is the Atlantic one, *C. ilicifolia* the Pacific. In its distribution, ours, like its eastern analogue, is southern. *C. ilicifolia* does not appear to extend to the northward of San Francisco Bay, and here, at its northern limit, it does not make much of a tree, but is low and shrubby. Its broad, shining, spinose-toothed, evergreen leaves render it useful, as well as ornamental, for hedges, and it has here and there been planted for that purpose. Southward, in the counties of Monterey and San Luis Obispo, it becomes a low, well-rounded tree of compact habit, with a clean trunk, showing a rough very dark bark. The fruit of the species is nearly an inch in diameter, of round outline, but distinctly compressed laterally. The sweet and agreeable pulp is very thin, the stone large, thin and soft for that of a cherry, and the kernel is of so mild a bitter as to be scarcely unpalatable—quite comparable with that of the Bitter Almond. On the island of Santa Cruz, off Santa Barbara, and elsewhere in that archipelago, the species comes out with narrow and perfectly entire foliage. This was at first thought to be specifically distinct from the tree of the mainland, and so like the West Indian *C. occidentalis* that it was so referred. But specimens growing on the grounds of the University, now five years old, from seed of insular trees, up to this time have shown only the notched and Holly-like leaves of the ordinary *C. ilicifolia*. It should therefore, at most, be made only a variety, *integrifolia* (Britton), of *C. ilicifolia*.

University of California. *Edward L. Greene.*

An Oak Scale.

DURING the meeting of the New Jersey State Horticultural Society, Mr. E. P. Beebe, of Elizabeth, New Jersey, brought a small branch of Oak, densely covered with round, clear, golden-yellow scales, and stated that the entire tree was as fully infested. The tree is isolated, in a garden plot in the city itself, and is an old Swamp White Oak. The attack was first noticed during the summer of 1890, but it must have existed some time before. Apparently no other trees in the vicinity are so infested. The scales (see Fig. 43) are either round or a little oval, densely clustered, especially on the smaller twigs, but they do not spare even the older wood. They are from ·04-·08 of an inch (1–2 mm.) in diameter and slightly convex, hard and brittle. Beneath the scale there is a distinct, cup-like depression, extending not only through the bark but indenting the wood itself. I recognized the specimens at once as *Asterodiaspis quercicola*, Bouché, a European species, which Mr. L. O. Howard, of the United States Department of Agriculture, had exhibited at the Toronto meeting of the American Association for the Advancement of Science, from the European Oaks in the Department grounds. In the report of the Department for 1880, Professor Comstock, then United States Entomologist, described the species. According to him, the male scale is oval rather than round, and only about half the size of that of the female. He had not found any male scales, and copied the description from the European authors. In none of the specimens seen by me do I identify a male, and the differences are either less than described, or that sex does not occur very abundantly. Professor Comstock states that the scales are "upon the imported Oaks in the Department of Agriculture Grounds at Washington. The species is not a common one in Europe, but is occasionally quite destructive to an individual tree." I have seen no record of the occurrence of this scale other than at Washington, and its appearance at Elizabeth, on a native species of Oak, is decidedly interesting. I recommended a thorough winter spraying with the kerosene emulsion, one to ten, with the view of destroying whatever of life existed in or under the scales, and I would suggest that a lookout for this pest be kept on ornamental trees. If it be discovered the treatment should be radical. If not too wide-spread, all infested twigs should be cut and burnt. If that be impracticable the trees should be thoroughly sprayed with the kerosene emulsion when clear of leaves. Trees so badly infested as that from which my specimens came will inevitably succumb. The figure gives some idea of the appearance of an infested twig, and most of the specimens showed a greater number of scales than that figured. They are on all sides of the twigs and branches.

Fig. 43.—An Oak Scale.

Rutgers College. *John B. Smith.*

How We Renewed an Old Place.

VII.—A NEW PERENNIAL GARDEN.

A LITERARY man, who paid his only visit to Scotland in the winter-time, remarked that he realized more fully than ever before how great was the genius of Sir Walter Scott, which had given world-renown for picturesqueness to those low, round, bare, uninteresting hills, the Trossachs. Lacking that genius, I am somewhat dismayed at making my very unimportant little garden the subject of a paper. Our late, cold springs render it rather a dreary object of contemplation even in the month of May, and with only the power of words to help the reader's enjoyment, I shall have to ask indulgence for the meagre record of its very simple charms.

Mrs. Carlyle used to tell a story of an Irish prison that was to be built out of the stones of an old one, while the prisoners were to be kept in the old jail until the new one was com-

pleted. This tale suggests our fashion of constructing a new garden out of the former one, and in our case the prisoners showed a decided preference for the original institution, and were with great difficulty persuaded to leave it. We started out with no very definite plan beyond killing two birds with one stone, always a desirable object when one is short-handed, and the results scarcely merit a place in so eminent a horticultural sheet as this, except to point a moral for the editor, whose text we are proud to be, and to adorn his next account of how well the knowing ones would have managed it. But you shall hear, and we can at least serve as a warning.

While the house at Overlea was building, the carpenters kept their tools in a part of the old dwelling that was still standing, and their constant journeys to and fro, between the knoll and the workshop, wore a narrow winding path, along which we had a flower-bed dug, to put such roots in as we wished to bring with us from the rented place that we were occupying, and also to serve as a home for such plants as we might dig up about the farm. Some sprigs of Box, broken from the arbor, and set in the soil at the edge of the bed, took root and made a rough border, and here, in August, I transplanted Lily-bulbs, and a little later put in such perennials as needed to be set out in the fall.

Between this flower-bed and the street were three rows of straggling old Pear-trees that gave some suggestion of possible fruitfulness, though it seemed likely that they were too old to profit by pruning. They had been famous in their day, and still preserved the remnants of a reputation, though more modern varieties have borne away the palm in newer gardens. But Bartletts and Sheldons and Seckels will never be out of date, and there are others, the very names of which the old settlers have forgotten, which still yield sweet and luscious fruit, when the weather and the insects permit. Half-dead they seemed when we first went to work at them, cutting away the dead branches and scraping their mossy trunks, to the infinite disturbance of the insects that had clustered there for warmth, and we recognized that only strong methods would revive them.

We needed sods for the terraces we were making, and so began by removing the turf around the trees, leaving narrow strips of grass to walk upon. This furnished us with three wide beds, which we fertilized heavily with rich compost and wood-ashes, the surface being tilled with great care, keeping the edge of the spade turned toward the trunk to avoid cutting off the rootlets of the trees. A memory of an old garden in which I had played when a child, where Pear-trees grew among the flowers, induced me to think of utilizing these broad fertile spaces for perennials. The Pear-trees were at that time doubtful as fruit-producers, but they would afford a grateful shelter from the hot sun when we were working among the plants, and their sparse foliage would hardly interfere greatly with the flowers.

In the spring a generous friend sent me a box of hardy plants, which were set out at random, as they came without labels, and many of them were unfamiliar to me. I do not find that they interfere much with the Pear-trees, which, under this steady cultivation, yield more of their fine old-fashioned fruit than we know what to do with, for pears are a drug in this market and can hardly be given away. The Pear-trees certainly do not hinder the growth of the sturdy perennials, which multiply enormously, so that every spring and fall there are boxes full of them to be given away. A nurseryman, who came last year to set some Strawberry-plants, declared that, if properly divided, there were roots enough there to stock an acre.

Such strong, showy plants as the Iris, the Foxglove and the Giant Evening Primrose flourish admirably, while Phlox and Hollyhocks and Columbines and Spiræas encumber the ground.

There is a huge Oriental Poppy that is a gorgeous spectacle, with its rich blue-green velvet robes and its silken headgear of scarlet and black, producing all alone the effect of a procession, as Brett Harte once said of Roscoe Conkling.

Smaller Poppies come up of their own accord, some single, some double, as the fancy takes them, and there is a wild array of Larkspurs and Coreopsis and Sweet Williams all summer. In the spring the variegated Thyme comes up promptly, followed closely by English Daisies and Moss Pinks, and Pansies and Violets, white, blue and yellow. The Giant Solomon's Seal rings its green bells over the heads of the tiny Bellwort; and all summer the Lilies and Pæonies and Spiderworts fight for possession of the ground, while the perennial Peas and Calendulas and Marigolds linger there till the last frost-horn blows.

The collection is not very choice, and, beyond a periodical struggle with the weeds, which try to grow as rampantly as the flowers, it gets not very much attention; but it makes a fine show from the street, and from the veranda which looks down upon it. Any minute effects would be wasted here, and we do not extend its area, which we might readily do, because it already requires more attention than we are willing to spare from the shrubs and trees that we are hurrying along upon the lawn, and which, consequently, take all our best energies, as well as the lion's share of food. In short, the flower-garden takes what it can get—copes more or less successfully with its own weeds, and possibly is more satisfactory than if we took more pains with it, and so were liable to disappointments. It is not at all well adapted to annuals, even Mignonettes and Asters, which are sown every year, for the stronger plants rob them of their proper nutriment; but I have future plans for a parterre in that neighborhood which shall have fitting accommodation for all the sweet old-fashioned kinds of yearly flowers.

Supplemented by the old garden, the new will even now at any season afford a fragrant and showy nosegay, such as our grandmothers liked for a beaupot, and there is always a mass of color under the Pear-trees until late in November, when the cold pinches the very last Calendula. The neighborhood of the salt-water makes this garden cold, and slow to awake in spring; but, on the other hand, it modifies the temperature in the autumn, so that it escapes the early frosts, and, under the shelter of the trees, the flowers last long after those upon the high ground about the house have withered and fallen.

There is a sheltered corner, backed by a mass of Lilacs and Mock Oranges, where I dream of seeing some day a fine clump of Rhododendrons and hardy Azaleas, though I have some doubts about a southern exposure being the very best thing for them; but the decorative effect from the house will be so good that we are disposed to make the attempt.

Hingham, Mass. *M. C. Robbins.*

New or Little Known Plants.

New Orchids.

Mormodes Lawrenceanum, Rolfe.—A fine species of this interesting genus, which was imported from New Granada by Messrs. Linden, L'Horticulture Internationale, Parc Leopold, Brussels, and flowered in that establishment during January last. It is allied to *M. Cartoni*, Hook., but has more acute segments and a markedly pubescent lip. The erect racemes bear numerous flowers, which have the sepals and petals lined with brown, on a paler ground, and the lip light ochre-yellow, with a few light brown spots. It is dedicated to Sir Trevor Lawrence, of Dorking, the possessor of one of the finest collections of Orchids in existence.—*Lindenia*, t. 273.

Zygopetalum Lindeniæ, Rolfe, is a very pretty Zygopetalum, much resembling *Z. rotratum* in habit, but belonging to a different section of the genus. It has large flowers, borne in twos and threes, on an erect raceme, the sepals and petals light rose color, the lip, with many radiating rose-purple lines, on a white ground. The large fleshy crest, which is purple in color, shows that it belongs to the section *Enzygopetalum*. It was discovered by Monsieur Bungeroth in Venezuela, and imported by Messrs. Linden, L'Horticulture Internationale, Brussels.—*Lindenia*, t. 275.

Cattleya × Parthenia, A. Bleu, is a very handsome secondary hybrid, raised from *C.* × *fimbriata*, crossed with the pollen of *C. Mossiæ*, by Monsieur Alfred Bleu, of Paris. The flowers are white, the disc of the lip bright yellow, and the front lobe light rose-purple, both disc and front lobe being veined with deeper purple. Different plants have flowered at various seasons of the year, from April to November. The mother-plant, *C.* × *fimbriata*, was raised from *C. intermedia*, crossed with the pollen of *C. Aclandiæ*, so that three species are involved in the parentage of the present hybrid.—*Lindenia*, t. 276.

Lælia anceps, var. holochila, Rolfe, is a distinct and very remarkable variety, with an entire lip; evidently a peloriate condition of the species. The sepals and petals are lilac, the lip light purple, with a white disc and some yellow at the base. The petals are rather narrow, and the lip elliptical-lanceolate, over two inches long by three-fourths of an inch wide. It was imported by the Liverpool Horticultural Company with *Lælia anceps morada*. There are several plants in existence, all showing the same character, and may all be subdivisions of one original clump.—*Gardeners' Chronicle*, April 4th, p. 426; Garden and Forest, April 15th, pp. 172, 173, fig. 31.

Cattleya × Vedasti, Perrenoud, is a hybrid raised in the collection of M. Perrenoud, of Paris, between *Cattleya Loddigesii* and a form of *Lælia pumila* (to which the name

"*Cattleya Pinelli marginata*" is affixed), the latter being the pollen parent. It flowered for the first time in November, 1889, from seeds sown in 1883. The flower is ten centimetres in diameter across the petals, light rose-purple, flaked with a slightly darker shade, the lip nearly entire, undulate, the front lobe crimson-purple, with a paler margin, the side lobes margined with light rose-purple, and the disc rather pallid with some purple veins.—*Orchidophile*, February, 1891, p. 48, with colored plate.

Kew. *R. A. Rolfe.*

Recent Plant Portraits.

THE *Botanical Magazine* for May contains a figure (t. 7172) of the trunkless *Yucca rupicola*, a native of western Texas, where it was first discovered by Lindheimer, and of northern Mexico as far south and west, at least, as Chihuahua. It is one of a group in which the leaf is margined with minutely horned teeth, and is a showy plant in flower, although, unfortunately, it has not proved hardy in northern gardens. It is interesting to note that it has now flowered in England in the open air—in the garden of Canon Ellacombe, at Bitton.

There is a figure of *Hermannia cristata* (t. 7173), a native of southern Africa, and rather a weedy-looking subject, although it is said to deserve a place in any conservatory, but which, however, is rather botanically curious than horticulturally beautiful. It is interesting in that it differs from all the other species of southern Africa, where the genus is very largely represented, and in approaching an American species, *Hermannia Texana*, in the broad crest of the capsule.

Wahlenbergia undulata appears on t. 7174. This is a widely diffused species from the Transvaal to the Orange Free State and southward to Plettenburg Bay, ascending an elevation of 6,000 feet on the mountains of Natal. Our correspondent, Mr. Watson, who visited southern Africa a few years ago and who brought home seeds with him, speaks of it as "growing in masses in marsh-lands, the stems supporting one another, and the whole forming a beautiful picture, suggestive of a group of Campanulas." It is said to be well adapted for pot culture as a hanging plant, as the branches descend on all sides, with ascending tips loaded with bright blue flowers.

There are figures also of *Pitcairnia Roezlii* (t. 7175), one of a large number of Pitcairnias with red flowers, which resemble one another closely in habit and structure. The species here figured is said to be one of the finest of them all; it is distinguished by distinctly petioled and comparatively broad leaves and long simple racemes of bright scarlet flowers, remaining in perfection for a long time. It is a native of South America.

Cœlogyne Rossiana is figured on t. 7176. This is a native of Burma, and a not very showy species, although, as the editor points out, of considerable botanical interest.

Foreign Correspondence.

London Letter.

L'Horticulture Internationale, Brussels.

THIS powerful nursery company was founded four years ago on the nurseries of Monsieur John Linden, who had built up for himself a great reputation in Ghent, where during the greater part of half a century he occupied himself with the introduction and cultivation of beautiful exotic plants of all kinds. What Veitch, Low and several others were to English, Linden was to Belgian horticulture. But Ghent is provincial, and Monsieur Linden felt that Brussels could afford much greater opportunities for the success of his enterprise. His anticipations have been more than realized, for not only does his "Société Anonyme" include some of the most influential and the richest of Belgian amateurs, but the result of his venture has been to create among the wealthy residents in Brussels, as well as in Belgium generally, a love for Orchids which now bids fair to become at least as far-reaching as it is in England.

The director of the company is Monsieur Lucien Linden, his father retaining control only over the collecting and introducing of new plants. The nursery is very extensive; it is almost entirely devoted to the cultivation of in-door plants, and is planned in such a manner as to afford the best possible conditions for the healthy growth of the plants and at the same time the most enjoyable "show-room" for visitors. From the entrance to the stoke-holes everything in the establishment is in most admirable order, so that whether the visitor is inspecting the gigantic Palms and Tree Ferns in the corridors, the tropical Orchids or the admirably fitted workshop in which packing, cleaning, potting, etc., are performed, he cannot help being struck by the excellent order and cleanliness which prevail everywhere in this well-organized establishment. The nursery is a gigantic drawing-room, for it teems with beautiful objects which may be inspected with perfect ease and enjoyment. In my opinion, this nursery is one of the very best of the many attractions which the beautiful town of Brussels offers to visitors.

So much for L'Horticulture Internationale as an exhibition. The attractions for cultivators of exotic plants are, at least, as great as those of any other nursery known to me. The collection of Orchids is very extensive. All the best garden kinds are grown in enormous numbers and grown wonderfully well. Odontoglossums, Masdevallias, Cattleyas, Lælias, Vandas, Aërides, Dendrobiums—these are represented by thousands of plants, and all so full of vigor that one can scarcely refrain from purchasing. The houses, of which there are about thirty, are all very large, some exceptionally so. They are lightly built, with stages running close to and parallel with the roof-glass; the floor is of fluted tiles, and beneath the stages there are open tanks of soft water. The material used for shading is thin lath-blinds, so constructed as to allow the rays of sunshine to reach the plants directly, but never to shine on any one point long enough to burn. The compost used for almost every one of the Orchids is a mixture of finely chopped sphagnum, and chopped peat formed of the roots of Polypodium, not the Brake Fern commonly used in England. Water is supplied much more liberally than one usually sees, even for Orchids, some of the plants, such as Odontoglossums and Vandas, being liberally syringed overhead several times a day, even in spring. These are the conditions and material, so far as I could discover, which produce such marvelous results in this nursery. There remain still the skill and judgment of the cultivator. Monsieur Linden is his own grower, but he knows the wisdom of having a large staff of permanent assistants. Very few of the men employed by him are what are termed journeymen.

I must not overlook one very important item in the cultural arrangements of Monsieur Linden, namely, the use of tobacco to keep down insect pests, the curse and ruin of the large majority of Orchid collections. Tobacco is an old insecticide, but it is not often applied as Monsieur Linden applies it. In every house, resting upon the hot-water pipes and held in position by means of wire netting, is a layer of the refuse stalks and midribs of tobacco leaves, which, in Belgium, can be obtained at about seven francs the hundred kilos. This is wetted once or twice a day and the vapor which arises is consequently impregnated with nicotine, which permeates the whole atmosphere in the house and is inimical to insects. It does no harm to the most delicate plants, but it keeps down insects so well that Monsieur Linden finds it scarcely ever necessary to clean his plants. In this manner much labor is saved and the plants are kept clean. Moreover, the injury which is the almost inevitable result of scraping and sponging the leaves of delicate Orchids, is altogether avoided. In England tobacco is too expensive to be used in this way, but it would not be difficult to devise some means for obtaining the nicotine cheaply and in such a form as would satisfy the excise authorities. These are small details, perhaps, but upon them a great deal more depends than many growers imagine.

There is a house with about five thousand magnificent plants of *Angræcum sesquipedale*, only a few months imported, but as healthy in foliage and vigorous in root-action as though they had been there for years. Then a huge houseful of *Lælia purpurata*, many of them grand specimens. A large batch of healthy plants of *Saccolabium cœleste*, one of the most beautiful of blue-flowered Orchids, was pointed out as "all that remained" of a very large and successful importation of that very bad traveler. Of Odontoglossums I saw some of the most beautiful species and varieties that it has ever been my privilege to see. Their names were legion, their value, in many cases, almost fabulous; about their exquisite beauty there could be no question. It was abundantly evident from what I saw that Monsieur Linden had "struck a particularly rich vein" of *Odontoglossum crispum*. His recent great success, *Cattleya Warocqueana*, which he insists is the autumn flowering *C. labiata*, is revealed in an astonishing range of richness of variety, both in habit of plant, form of flower and in color. As a garden Orchid it is of the very highest merit, being a vigorous grower, and flowering with great freedom even for a Cattleya. Monsieur Linden pointed to the few plants which remained of the thousands he began with as a proof that Orchid fanciers had discovered the beauty and value of this Cattleya.

A house containing several thousand plants of Dendrobiums from northern Australia, all in splendid health and most of them coming into flower, was pointed to with pride by both

Fig. 44.—A Young Swamp White Oak (*Quercus bicolor*) in Winter.—See page 241.

the veteran Monsieur John Linden and his son, as being likely to reveal some treasures in the way of *D. Phalænopsis*, *D. Goldieana*, etc., before very long. A big batch of *Cattleya Buyssoniana*, another of the new *Coryanthes Bungerothii*, another of *Grammatophyllum Ellisii*, and still another of the new Bornean *Cœlogyne peltasites* followed each other in rapid succession. These may be taken as an example of the richness of the collection which was revealed as we walked through one house after another; they also are evidences of the enterprise of this company in the work of introducing new plants, for in these plants we have new discoveries made by Monsieur Linden's collectors, and under his directions, in Australia, Borneo, Madagascar and South America. At present there are five collectors employed solely in the search for new plants, two others being told off to look after those which are in great demand, such as Odontoglossums and Cattleyas.

Smaller houses contain many rarities such as delight the eye of the connoisseur in Orchids. I noted in them living plants of the beautiful Telepogons, which are certain to rival the best Masdevallias if they can only be induced to stay with us. *Trichoceras muralis*, *Lissochilus giganteus*, *Hæmaria Otleta*, a prettily veined ally of Anæctochilus, *Cattleya Rex*, which Monsieur Linden declares is the most lovely of all Cattleyas, and which has been seen by his collector with fourteen flowers on a spike. *Cattleya Gibezi*, the white variety of *C. superba; Odontoglossum Leopoldii*, one of the most beautiful of recent discoveries. I might go on to enumerate all the best Orchids hitherto described, and add to them nearly fifty new ones as yet undescribed, but here growing under Monsieur Linden's watchful eye, and even then I should not have exhausted the list of interesting Orchids to be seen at this nursery.

Although Orchids are the principal plants, there are many others which are objects of Monsieur Linden's special care. Nepenthes of all kinds are grown in large numbers, a large house being entirely filled with them, so far as roof-space is concerned. Stove plants of the choicest kinds, such as Aroids, Palms, Ferns and many flowering plants, are represented by many beautiful species, a considerable number of them being quite new. Monsieur Linden has decided to pay particular attention to this class of plants, which have lost considerably in popular favor, chiefly because collectors have neglected them for Orchids. He has already secured a large number of new things, which, unless I am very much mistaken, are certain eventually to meet with general favor among lovers of exotic plants. At present I can only refer to them thus vaguely.

By their work in the introduction and distribution of plants alone the Messrs. Linden have won for themselves a reputation of the very highest standing among European horticulturists. Besides this, they have enriched the literature of the garden by their publications, of which *Lindenia* is the most meritorious, the *Illustration Horticole* and the *Orchidophile* being also useful to practical men. Monsieur Lucien Linden has also invented a boiler for heating plant-houses which is likely to become a powerful rival to the best of boilers in use at present. It may be described as a combination tubular and saddle, with an arrangement which insures the exhaustion of all the fire-heat before it leaves the boiler, and the economy of fuel. For large structures, where much piping is necessary, this boiler is likely to become popular.

To those who want to look at all the best Orchids grown, as only few can grow them, I would recommend a visit to Monsieur Linden's establishment. Altogether this nursery is one of the most instructive as well as one of the most delightful to be found in Europe.

London. *Visitor.*

Cultural Department.

The Abuse of Insecticides.

GREAT things are evidently anticipated, all over the country, from the use of insecticidal poisons in Orchards, and upon many of our small-fruit plants. There is also a strong disposition to use mineral poisons as fungicides. I am by no means disposed to make objections to any proper and necessary use even of arsenical preparations, when they are not applied directly to the edible product of our orchards and gardens. I am fully prepared to allow that they may be so used, and that no traceable evils will be noted, perhaps for a long time, if ever. I will admit even, that a small quantity of arsenical spray, falling upon green grass, will not be likely to cause any marked effect upon the health of the animals fed upon either the grass or the hay made from it. It may be true that in many cases nothing short of spectrum analysis will show the presence of arsenic in such food. But, nevertheless, arsenic is a very dangerous substance to introduce into the food of man or beast, even in minute quantities. This is fully proved by the many cases of poisoning from inhabiting rooms papered with arsenical papers. The symptoms of this form of poisoning are so very obscure that even the most skillful diagnosticians may fail to recognize them. On the other hand, I will allow that too much has sometimes been made of the danger arising from this cause. With all reasonable discounts called for by these admissions, hundreds of tons of a most virulent mineral poison in the hands of hundreds of thousands of people, to be freely used in fields, orchards and gardens all over the continent, will incur what in the aggregate must be a danger worthy of serious thought.

As for myself, I have decided that I cannot consent to the use of arsenical sprays in my orchards, either as an insecticide or a fungicide. I have no doubt at all that they can be made effective in the destruction of some of our worst insect pests, especially the codlin moth, the curculio and all leaf-eating species. But there are other effective means within our reach, and without the use of these sprays we may still easily supply, and even overstock the markets with fine fruit in all except such very exceptional seasons as last year. The careful grower should be very cautious in the use of this class of remedies. What will be the effect on consumers when it is widely understood that arsenical sprays are in general use in American orchards?

The codlin moth is rather a benefit than an injury in well-managed orchards. Without them our trees would be overladen, and even with their help, thinning by hand is often imperative. True, the moth makes no discrimination in depositing her eggs, and the worms infest the largest and finest as well as the inferior fruits. But still there is enough for the market, and if all orchards were even fairly well managed there would be a large surplus for export in all but the very worst seasons. As for other insects, like the curculio, which may be met and foiled by simple mechanical means, no other method is needed. Plum-growing is really made more profitable to reasonably active growers by these little beetles, and, without the curculio, plums would soon become too plentiful to be profitable, except in the case of the very finest fruit. In the highest interests of orchard-industry, therefore, I hope it will be seen that the direct application of this substance to fruit-trees, after the formation of the fruit, had better be avoided, at least until its necessity is more fully established.

Newport, Vt. *T. H. Hoskins.*

The Influence of Stock upon Cion.

ABOUT a year ago a large number of experiments in herbaceous grafting were performed by a student under the direction of Professor Bailey, and, among others, a trial was made of grafting a portion of a half-grown Dwarf Champion Tomato upon a similar fruit of the Ignotum variety, from which a corresponding piece had been removed. In habit of growth, as well as in fruit, the Dwarf Champion is very distinct from the Ignotum; the former has thick and short-jointed stems, thick, crumpled, dark green leaves, and the fruit has a distinctly purple tinge; the Ignotum is similar in character to the common red varieties. The two parts of the graft united and grew to maturity, after which the seeds were removed and planted, care being taken to keep the seeds of the two halves, stock and cion, separate.

The results obtained from the seeds of the cion half of the fruit, the Dwarf Champion, were very striking; so surprising, indeed, that it was decided to distrust the accuracy of the records of the experiment until it should be confirmed by further trials. Soon after their appearance above ground the plants from these seeds began to show some of the characteristics of the stock. As the plants developed, this resemblance to the Ignotum increased until at maturity both the plants and the fruit which was produced were indistinguishable from the pure Ignotum variety.

The interesting development of this experiment led to its repetition during the past winter, the work being carried on by means of the Tomato-plants growing in the forcing-houses of the Experiment Station. Of the grafts thus made a part were Ignotum upon Dwarf Champion as a stock, the reciprocal of that mentioned above, and from the seeds of the cion half young plants are now growing which again show a very decided influence from the stock, being plainly intermediate in character of leaf and in habit between the two varieties,

thus confirming to that extent the observations made during last year's experiment. The further developments of the plants and their fruit will be looked for with great interest, since, among the many forms of grafting which have been practiced in the past, few, if any, records are to be found of such a preponderating influence of the stock.

Cornell University. *C. W. Mathews.*

Lima Beans.

THE Bush Lima Bean known as Henderson's, while quite small, is enormously productive and of fine quality. It is remarkable how quickly other varieties of this form of Lima Bean have appeared since the advent of Henderson's. This year Dreer's Bush Lima Bean is placed on the market. The seeds look like the ordinary form of Dreer's Lima Bean, and, if as good as this, will be valuable. Lima Beans have been very uncertain and unproductive in the south, while Dreer's always did well. We have another form of Lima of bush habit. These are larger than Henderson's and larger than the old Sieva or Butter Bean of this section. The seeds are handsomely mottled like the Golden Wax Bean, some of them almost as dark as Scarlet Runners. This is possibly a cross with the latter kind, as the blooms are said to be pink. There are two forms of this Bean, one a climber sent by a North Carolina grower, and the other said to be dwarf, and sent by a Georgia seedsman. Henderson's Bush Lima was also of southern origin, having been raised in Campbell County, Virginia. The prospect is that soon all tastes can be suited with bush varieties, and poles will no longer be needed. One of the greatest advantages of these Bush Limas is the fact that most of them are earlier than the pole sorts, so that the season for this vegetable at the north will be much lengthened.

Raleigh, N. C. *W. F. Massey.*

Spring Garden Notes.

THIS spring has proven the most successful season with us in the cultivation of Irises. A dozen roots of *I. Susiana* were purchased in the fall, and these were planted in deep pans and placed in a cold frame; they were often frozen during the severe winter, but they started to grow, and recently bore eight large flowers. After flowering the foliage dies off rapidly. The pans will then be placed in a frame covered with a sash, where they will receive a thorough drying off. In the fall, when signs of growth are apparent, they will be repotted and treated as before. Any one having a cold frame can grow this plant.

Tulipa cornuta is in flower in the border. Its petals are yellow, striped with red, and are long, very narrow and erect. *Anemone coronaria*, the Saint Bridgid strain, are flowering fairly well in an open border, where they were planted in November last, and covered with dry leaves. When the leaves were removed this spring many had already commenced growing, and since then others have come up. There is no doubt that frame-culture is best for them in Massachusetts, but our frames were all filled when the Anemones came to hand. They were imported direct from Ireland, where the St. Bridgid's strain originated, and where I have had the same strain in bloom in the open border every week of the whole winter. The practice was to sow seeds in the spring for the next winter's flowers; in the moist climate, with very little frost, they were almost evergreen, and flowered abundantly, especially in spring. Anemones require a rich, well-drained soil and early fall planting.

Puschkinia Libanotica.—It is a matter of surprise to me that this desirable plant is not better known. It blooms earlier than the Chionodoxa or Scillas, and, to my mind, is prettier than the Chionodoxa. *P. compacta* is said to differ from the type in having more flowers to a stem. The flowers are like little white bells with a blue stripe down the centre. The Puschkinia is as easily grown and naturalized as the Scilla or Grape Hyacinth. Those who want a showy and easily cultivated spring-flowering plant must not forget the *Mertensia Virginica*. We planted a lot of collected roots last fall which came from Iowa, and they are now vigorous and every one is in flower. The Mertensia should, I think, be planted in the same way as the Oriental Poppy, in patches or clumps, as both die down at midsummer. Annuals may then be planted over them to cover the bare ground. Hardy Cypripediums brought on in pans to flower at this time are a great success, especially *C. spectabile*. We use fourteen-inch pans, with plenty of soil, and these hold six to eight crowns. Many of the stems are bearing two well-colored flowers each. There was a fine exhibit of this plant at the spring show in Boston, by Mr. Jackson Dawson. It is not generally known how easy it is to have an Orchid that will rival any of the exotic Cypripediums in its delicate coloring, or we should not be able to buy good strong collected roots of *C. spectabile* at six cents each. *Cypripedium pubescens* and *C. parviflorum* have also done well, but they do not equal the showier species. All these Cypripediums force well year after year, but as much care must be taken of the plants after the flowering period as before.

Spiræa (*Astilbe*) *Japonica* is a good plant for forcing. It does not seem to be generally known that the variegated variety, besides having leaves variegated with golden yellow, has also spikes of flowers that are much more dense and compact, while equally as graceful as the typical variety. It lasts longer, and is altogether a better plant for room decoration and for cutting purposes. It is easily obtained in the fall from dealers and growers in hardy plants. Home-grown clumps of Astilbe give much better results than imported ones, as the buds that contain the flowers get badly bruised in transit.

S. Lancaster, Mass. *E. O. Orpet.*

Musas.

THIS handsome group includes several species and varieties of value for conservatory decoration where space is ample, and during the summer some of them are also useful for out-door tropical effects, for which their bold leaves make them particularly desirable. When planted outside, however, the Bananas should have a somewhat sheltered position, for when exposed to the full force of the wind the leaves are often split and torn. These plants are gross feeders and enjoy rich soil, and respond to liberal treatment generally. Another point in their favor is, that they are but little subject to insect pests, unless surrounded by infected plants of other species.

The true Banana, *Musa sapientum*, is rather too large a plant to be included in a small collection, but the variegated form of this species, *M. sapientum vittata*, is an extremely handsome one, and is not quite so rampant in growth as the type. This variety is perhaps the most striking member of the genus, the leaves being oblong in form and the ground color bright green, on which are many stripes and blotches of white. The fruit is of little value, but when planted out in a warm house, and at the same time encouraged in growth by a moist atmosphere and plentiful watering at the root, it makes a very effective specimen. The propagation of this form is accomplished by means of suckers, which, in common with most of the members of this genus, it produces in moderate number.

The Chinese Banana, *M. Cavendishii*, is quite dwarf in habit, and has been frequently fruited under glass, for when full-grown it seldom reaches more than eight feet in height, and has often been fruited when about six feet. Its leaves are from three to four feet long and one to two in width, forming a rather compact head of dark green color, and the stem is quite stout in proportion to its length. *M. Cavendishii* is also propagated by means of suckers, the latter being thrown up at the time of fruiting, and frequently before this occurs.

M. coccinea is another highly ornamental species, and was introduced from Cochin China many years ago. This species is of comparatively slender growth, and has bright green leaves about three feet long and six inches wide, the entire height of the plant being from four to six feet. The most striking feature of *M. coccinea* is the flower-cluster, which is terminal and about one foot long, and covered with spathes of bright scarlet, making it the most showy member of the genus in this respect. It may be well grown as a pot plant if it be not convenient to plant it out, by giving it a little extra stimulation in the form of liquid manure from time to time.

The Abyssinian Banana, *M. Ensete*, is now well known as a plant for decorative use, either in-doors or out, and is grown from seeds in quite large quantities in some commercial establishments. This is probably the largest species of this genus, the stem sometimes reaching a height of twenty feet, while the leaves are truly immense. The latter are bright green in color, with a red midrib and stem, and stand out boldly in a semi-erect manner. The fruit of this species is of no value except to furnish seeds, these forming the only means of propagation, as *M. Ensete* does not produce suckers. *M. superba* is also a strong-growing species, and bears some resemblance to the preceding, though possibly more compact in habit, and is a native of India. The two last-mentioned are the best species to use out-of-doors, their leaves being tougher than those of most of the others, though *M. Cavendishii* may also be used in this manner if it has not been grown in a close, warm house just previous to removal outside. *M. zebrina*, also from India, is another handsome foliaged species, the

leaves of which are oblong in shape, and dark green in color, irregularly blotched with bronzy red and purple. The stem of *M. zebrina* is slender, and the plant seldom exceeds ten feet in height. Its peculiar coloring makes it an admirable contrast when grown in company with *M. Sapientum vittata*.

There are some eighteen species in all, but those specially referred to are the most useful for decorative purposes, and are all worthy of more extended cultivation.

Holmesburg, Pa. *W. H. Taplin.*

Gypsophila paniculata is one of the indispensable hardy plants, and seeds of it may now be sown. It should be grown in clumps, and, being furnished with long tap-roots, which make transplanting difficult, it is well to sow seed where the plants are to remain. The seed germinates readily, and plants sometimes show bloom the first season, or, in any case, make strong growth before winter. They are usually reliably hardy, and come into bloom in May and June in many-branched racemes of very small, fine, white flowers. Plants in flower are very pleasing, being covered with a mist of bloom. But it is for bouquets that they are of the greatest value, in their ability to blend and harmonize almost any gathering of seasonable flowers. While a cluster of one variety of flowers with their own foliage, properly arranged, is often the most satisfactory floral effect for vases, there is no reason why a varied collection should not be equally effective. Often, however, one finds, after gathering flowers with good long stems, that they do not seem, for some reason, to "compose" well. In such cases it will be often found that a cluster or two of light, small flowers will give the finishing touch to the arrangement, amalgamating the differing forms into a consistent and graceful group. *Gypsophila paniculata* will give a supply of early flowers, while later the Statices may be grown for the same service. *S. latifolia* is probably the best of the hardy ones, the flowers being very lasting. The little dwarf-growing Baby's Breath (*Gypsophila muralis*) is a dainty little hardy annual, which may be used for the same purpose, and is a beautiful front-border plant, where it will perpetuate itself if the border is undisturbed. The florist in early winter grows Stevia to lighten his bouquets.

Iris pumila alba is a light-colored form of the old purple *Iris pumila*, so common in gardens. Like the type, this plant is very hardy and very dwarf. The color is a faded, uncertain yellow rather than white, resembling in effect somewhat, though lighter in color than *Iris chamæiris*, the latter being very slightly taller.

Elizabeth, N. J. *J. N. G.*

Salsify should not be sown too early. It is a plant of very hardy character and germinates quickly. The result is, when sown so early, growth is checked by the hot weather of midsummer, the lower leaves die and many of the plants run to seed. The roots do not attain their best size and become tough and stringy before they mature. The sowing should be deferred until June, in ground that has been well manured for early radishes, beets, or spring spinach. Here and southward Salsify, sown in August, will make a better crop than if sown in the spring, as it will continue to grow until Christmas. Last summer one of my neighbors was obliged to change his residence about the middle of August. He sowed a plot of Sandwich Island Salsify in his new garden, and the result was the finest Salsify that I saw last year. People here are slowly finding out the value of their long temperate autumns, and I think the time is not far distant when, by later sowing and transplanting after the hot weather is gone, we can grow good fall Cabbage. Early sowing, starving through the long summer heat and drought, has brought about the tall-stemmed Collard, and from this Collard, with proper treatment, we will yet get the Southern Cabbage.

Tuberous Begonias are of special value here, for we find that the tubers are hardy and increase in size and vigor with slight protection. It has long been known that the old *Begonia Evansiana* is hardy almost anywhere with slight protection, but it is gratifying to find that this is also true of the showy and constant blooming sorts of recent introduction.

Amaryllis.—A bed filled with various Amaryllis is a very interesting object. The early blooming Atamasco, which has been making acres of woodland here gay for weeks past, is the earliest one to appear. This variety forms the outer edge, while the centre is filled with exotic species and an imposing clump of Johnsonii. This bed is on a sheltered lawn with no special winter cover, and the perfection of the great masses of Amaryllis gives one a new idea as to the hardiness of these bulbs.

Raleigh, N. C. *W. F. Massey.*

The Forest.

Redwood Timber.—II.

ANY estimates of the value of bodies of Redwood over three hundred acres in extent, which place the amount which can be taken off at over 100,000 feet per acre, are misleading, as even that amount is exceptional, and not to be had except by following water, instead of Government section, lines.

By far the larger part of the Redwood lands have passed from Government to private ownership. In Sonora, Mendocino and Humboldt Counties scarcely any good claims are not titled. By the Timber-land Act citizens could buy 160 acres at $2.50 per acre. A few years ago there was a perfect craze for this class of property, and immense quantities were purchased from the Government. Every one who could get the money took a timber-claim. Men who made a business of it located claims for hundreds. In the course of time the original purchasers have usually sold to mill companies or speculators, who are buying to hold as a long-term investment. Still a very large quantity in the aggregate is owned in tracts of 160 acres by persons who live on their land, selling pickets, trees, tan-bark, etc., and having a small area available for pasture, agriculture and fruit-raising. The Redwood soil produces the best of fruit, especially apples, and many comfortable homes are to be found in the forest.

The holdings of the mill companies range from a thousand acres upward, and are of extra fine selections, which have been bought from time to time. The men who are buying for investment also select the best, carefully inspecting all purchases, and some large buyers have all the forest scaled. Among the largest investment buyers are the "Scotch Syndicate," who have secured a very large area at Humboldt Bay, and several Michigan and Wisconsin companies.

A few figures as to the largest ownerships in Mendocino County may be interesting. The Fort Bragg Company own 70,000 acres; The Navarro Company, 35,000; Big River Company, 32,000; Gualala Company, 18,000. In Humboldt County the Scotch Syndicate is credited with 80,000 acres.

Redwood lands are held at from $5 an acre upward. Outside of exceptional locations, valuable from proximity to a railroad or tide-water, or of extra heavy timber, $5 an acre is a fair price, while claims are held as high as $40 an acre. Of the vast quantity that has changed hands in recent years far the greater portion has brought from $4 to $6 per acre, and any quantity of Redwood lands which will cut from 30,000 to 40,000 feet an acre, and which are within twenty miles of tide-water, can now be purchased at $6 per acre. Indeed, they are cheaper than they were a few years ago, because so much is owned by parties who cannot afford a long-term investment, and who are anxious to realize. If the quantity of land available for the use of the mills were limited, the land would be worth from $70 up, on the basis of usual stumpage, but the vast possessions of the mill companies make them independent, and timber-land on those streams can only be regarded as a long-term investment. The exhaustion of the forests east of the Rockies, in the future, with the great growth in population in California, will doubtless considerably accelerate the rate of cutting. At the present rate of cutting, the forest, if protected from fire, would almost reproduce itself before this growth is cut. The vitality of the Redwood is wonderful. From every stump hundreds of sprouts grow, and with great rapidity. In old clearings quite large trees are to be seen of the new growth.

The forest-fires do little or no injury to any but very small trees, but the seedlings coming up through the leaves, and the sprouts from the stumps, suffer, and although they reappear with great vigor, repeated burning finally destroys the life of the stump, and the Redwood charring grows up a tangle of Ceanothus, known as the "Blue Blossom" (*Ceanothus thyrsiflorus*), and only the blackened stumps testify to the once great forest. If forest-fires were prevented, no forest would be more easily perpetuated. Although the Redwood seeds freely, the number of seedlings to be found in the forest is very small. The Redwood in log is practically indestructible. Fallen trees will lie generations without decaying, and such trees are always cut up and sent to the mill. I have seen logs on which mold had gathered and good-sized trees grown, which were perfectly sound and good for lumber. To fire, as well as decay, these logs are invulnerable if sound. It is only when a tree is shattered in falling, or when a rotten heart gives the fire an entrance, that it can make any serious impression. When logging is done by water, the butt-cuts, which are too heavy to float, are left on the ground for several years to dry out, and, although the ground is burned over several times, are uninjured.

The first saw-mills were built in the redwoods in early days. That at Mendocino City was established in 1850, and has been in continuous operation since, with a present cutting capacity of 60,000 feet a day. This company gives a good illustration of the rate at which cutting progresses. It owns 35,000 acres on Big River, or less than half the water-shed. In its forty years' operations it has cut over less than ten per cent. of its own lands. Most of the large companies have been in operation from twenty to thirty-five years, and several have cut a smaller percentage of their timber than the Mendocino company. On the other hand, all of the timber on some small streams, two to five miles long, has been cut, and the mills moved to new locations. The exceptionally large logs, and the steepness of the slopes, give rise to methods of working peculiar to the Redwood industry. The mills are well equipped, and everything at the mill is utilized for which there is a market. In the woods the waste is large.

Oxen are used altogether in the woods, and logging is summer work. For the wood-roads skids are used, which are either greased or kept wet by water-carriers. From three to five yoke of oxen drag several logs attached by dogs and chains. In a few instances slides, or, as they are called here, chutes, are used. The tidal estuaries are used for dams, and a boom keeps the logs in. Redwood-trees have a bulge at the base, and in cutting large trees a staging is built around the base and the trees cut at ten to twelve feet from the ground. Very narrow, long-bladed axes are used by the woodsmen. The thick bark is peeled off before the logs are hauled. As sawdust cannot be dumped into the streams, it is burned in large furnaces. Logs above seven feet in diameter are blasted.

Ukiah, Cal. *Carl Purdy.*

Correspondence.

Are Plums and Cherries of one Genus?

To the Editor of Garden and Forest:

Sir,—The question is not raised with any view to a full discussion of the subject. If read with due consideration as to the meaning of the word "genus," there will seem little room for discussion at all, for it will readily appear as carrying with it its own negation. Each of the two principal terms of the query, as an English word, is simply and absolutely generic. Each calls to mind a natural group of trees and shrubs, and the two groups are so thoroughly distinct that neither orchardists nor botanists have ever in reality confounded them. No one has said that Cherries are only a sort of Plums, or that the Plums are merely so many species or varieties of Cherries. The qualities of the wood, of the bark and of the fruits of the two are so dissimilar, and their natural constitution, as indicated by their refusal to hybridize with one another, is so different that no man, learned or unlearned, ever thinks of them as congeneric. Nevertheless, some learned botanical theorists, under the disguise of a Latin nomenclature, have pronounced them to be of one genus. Prunus is the Latin equivalent of Plum or Prune, and Cerasus of Cherry, and some authors, dropping Cerasus out of their list of generic names, have named all the Cherry species as species of Prunus. This, in spite of the disguise, may clearly enough be read as a theoretical endeavor to make Cherries over into Plums, but that this is an artificial, not a natural classifying of these well-known trees is attested by the fact already alluded to, that the simple, every-day intelligence of men, whether botanical or unbotanical, has never regarded the two as congeneric. The trees have been under cultivation with nearly all civilized peoples from ages almost prehistoric, and there is yet no dialect of human speech in which they have but one term in use for these two kinds (genera) of trees.

It is not my purpose now to name in order those several distinctive peculiarities upon which many of the most eminent botanists, as well as the common judgment of all unbotanical people, have regarded the Plums and the Cherries as generically distinct. But having read, in a somewhat recent issue of this journal (page 180), that the limiting of the genus *Prunus* to the Plums, and the genus *Pyrus* to the Pears (excluding the Apples as a separate genus, *Malus*), is essentially at variance with the views of "most botanists," it has seemed desirable that a few hints of what may be said on the other side of the question should here be given.

The assertion that most botanists have held Plums and Cherries to be of one genus we judge to have been made without forethought; and only a passing review of leading authors is needed to show it erroneous. Of course we do not in scientific matters decide the merits of an opinion by the number of names of men who, figuring as scientists, have at one time and another subscribed to it. The greater number of botanical authors in every generation are, in so far as their systematizing goes, mere disciples of others. Their own opinions upon the limits of genera have no weight; they have, indeed, no opinions not borrowed. Let us see upon what solid strength of authority one may lean—from what illustrious masters one may have borrowed the opinion when he reiterates it, that the Plums and the Cherries are generically different. The following could hardly be objected to as a fair list of names of the supereminently original men who have figured prominently in the history of plant classification within the last two centuries: Ray, Tournefort, Dillenius, Bœrhaan, Haller, Linnæus, Adanson, Jussieu, Gærtner, Necker, De Candolle, Robert Brown and Salisbury. Only three of these thirteen taught that Plums and Cherries were all of one genus, and they were Linnæus, Gærtner and Brown. And I suppose that any well-read botanist of our time, if asked to name the four greatest of these thirteen, would be likely to select Tournefort, Linnæus, Jussieu and Adanson; and of these Linnæus alone would stand sponsor for the opinion that Cherries are only another sort of Plums. The doctrine originated with him. And if, coming down to our own day, we find in the majority of compiled floras and small hand-books the Linnæan extension of *Prunus* maintained, it is also true that in the most elaborate recent monographs of this family *Prunus* and *Cerasus* are held distinct; and so are *Pyrus* and *Malus*. I need only mention the names of Rœmer, Spach and Decaisne, whose treatises upon these plants, unsurpassed in scholarliness, must be in the hands of all who wish to attain to the fullest understanding of the subject. In America, at least in the western part of it, all our native Cherries were first described—some by Nuttall, others by Sir William Hooker—as species of *Cerasus*, not as sorts of Plums; and Asa Gray, in what is, after all, one of the finest monuments remaining to us of his great ability, the "Flora of North America," conforming to that opinion, which has the support of the most splendid array of great names, retained *Cerasus* for the Cherries and *Prunus* for the Plums, though in more recent works he accepted the unnaturally extended *Prunus* of Linnæus.

But still, everywhere outside the technicalities of the most artificial systematists, it is conceded that Plum and Cherry—*Prunus* and *Cerasus*—are generically distinct. Whether the lines of demarcation between the two will ever be so strongly drawn in the set terminology of botany as to satisfy the requirements of artificial systematists is unimportant. All men, without exception, when speaking in their mother-tongue, and the most weighty authorities upon natural classification in the plant-world, even in their Latin, salute the Plum-trees as one genus, and the Cherry-trees as another.

University of California. *Edward L. Greene.*

Southern Mississippi Floral Notes.

To the Editor of Garden and Forest:

Sir,—To one new to the south the flora of the Gulf shore of Mississippi is full of interest as early in the season as the first of May. The spring flowers have finished blooming, and Orchids are seen in profusion. Even from the car-window it was evident that lower Mississippi must be the home of the Polygalas. Chapman gives twenty-two species in his flora, and the most showy of them are now in full bloom here. The two most conspicuous are *Polygala lutea*, sometimes called "Bachelor's Button," with its orange-yellow flowers in dense spikes, scattered everywhere in the grass-land. More than any other plant, this reminds one of the Pine-barrens of New Jersey, where it abounds later in the year. *P. nana* is less abundant, with beautiful lemon-yellow spikes; the flower-stalks are very short. Among the other Polygalas now in bloom may be mentioned *P. incarnata*, *P. polygama* and *P. Chapmanii*. Everywhere in the grass beneath the tall, scattered, spectral, southern Pine-trees is the showy *Phlox divaricata*, with a tint of pink that at first leads one to take it for *Calopogon pulchellus*. Both of these plants flourish near each other, the latter in low wet places.

The two other Orchids most common in the moist places are *Pogonia divaricata* and its close of kin, *P. ophioglossoides*, each equally abundant and beautiful after its own type. These boggy places are full of the showy and peculiar leaves of the yellow Pitcher-plant (*Sarracenia flava*). It is late for blossoms now, but the variegated foliage makes up for any lack of bloom. Two Sundews frequent the same localities, the *Drosera rotundifolia* being sometimes so abundant as to cover the wet sand with a carpet of sticky red leaves. More striking than any other of these glistening fly-catchers is the *Drosera*

filiformis, which attains more than a foot in height, and bears a single flower an inch in diameter each day through the blooming season. The long slender leaves unroll like a watch-spring, and the inflorescence in like manner turns fast enough to bring the opening bud each morning to the upper side of the wheel.

As we pass to the dry areas again the two species of Star Grass, *Aletris farinosa* and *A. aurea*, are conspicuously abundant. They are about equal in size with their strict tall stalks, bearing numerous scattered blossoms, but one is a pure white, while the other is an attractive yellow. In the thickets there is a tangle of *Schrankia uncinata*. This plant is so sensitive that it closes its leaflets at the slightest touch of its prickly creeping stems. Overhead the *Magnolia fœtida* exhibits its gigantic solitary white blooms in striking contrast with the multitudes of minute Ilex flowers that cover the shrubs below. Perhaps the two most showy red blooms are those of the *Æsculus Pavia* and the more rare *Erythrina herbacea*, only one cluster of which we have thus far seen.

Ocean Springs, Miss. *Byron D. Halsted.*

How Dandelions Escape the Lawn-mower.

To the Editor of Garden and Forest:

Sir,—A day or two after a lawn has been cut with the mower the long, upright stalks of the Dandelion may be seen. The explanation that the stems have been bent down by the machine and left uncut may be true in some cases, but there is a peculiar habit of the plant that is worth noting here. The flower-stalks of this handsome lawn-weed are usually upright until the time of blossoming is past, when they bend outward and downward, and in from three to five days assume what may be called the "scythe-shape," or a double curve, with the head quite close to the turf. Almost any Dandelion-plant, growing unmolested and with several flower-stalks, will show all stages of this downward curving of the stems.

After the depressed stems have remained apparently inactive for from three to five days the period of rapid elongation begins, when they become upright, and the seed-ball is held several inches higher in the air than were the flowers of the same head a week previously. It will be remembered by those who have observed this matter that it is the seed-bearing stalks that quickly appear after the lawn has been mowed. The flowers are first raised for the attention of insects, then comes the reclined repose followed by the second uplifting, that the winds, this time, may bear away the parachute-provided seeds.

Rutgers College. *H.*

Recent Publications.

Description et Emploi des Eucalyptus Introduits en Europe Principalement en France et en Algerie. Second Mémoire. Charles Naudin. Antibes, 1891, pp. 1–72.

The first memoir published by Monsieur Naudin upon the Eucalyptus cultivated in Europe appeared in 1883. Since that time the veteran French botanist has continued his investigations, and has been able to study a much larger number of species in the garden of the Villa Thuret, over which he presides, and in which he has brought together the largest collection of these trees which has been formed; and in the present paper he arranges fifty-six of them in synoptical tables according to the shape of the leaves, the flowers and the fruit, so that the cultivator of these trees will be able now much more readily than ever before to determine the different species, which have always proved extremely difficult to understand from the fact that many of them appear entirely different in their juvenile and adult states, producing at first leaves of one sort and then later in life leaves of an entirely different shape and character. To overcome this difficulty in the study of the genus Monsieur Naudin has made a special Eucalyptus herbarium, in which are represented all the species cultivated in Europe, by specimens taken at different periods of their growth, and showing all the different stages through which they pass from youth to maturity. In these studies it may be mentioned that Monsieur Naudin has brought to light among the plants cultivated at Antibes no less than thirteen undescribed species, now first made known in this memoir, a fact which shows the value of arboreta and the importance of studying trees in a living state, where different species can be compared with each other and their differences noted.

A few brief extracts from the general considerations which form the first part of this work will be interesting, perhaps, to our readers, especially as different species of Eucalyptus are destined to play, it seems, an important part in the future of California, where many of them have long been successfully grown. "The most interesting things," Monsieur Naudin remarks, "about the genus from the cultural point of view, is the rapidity with which certain species grow, a rapidity which is unequaled by any of our native trees, and the quantity of wood valuable for manufacturing purposes and for fuel which they can produce in a comparatively short time. To this advantage possessed by these trees must be added that of being able to support themselves much farther south than most of our forest-trees of Europe, even to the southern limits of the Algerian Sahara, although the region in which they can be cultivated is extremely restricted on the north. There are certain species, however, natives of Tasmania and of the high mountains of southern Australia, which will succeed beyond the Mediterranean region, and which can be cultivated on the Atlantic coast as far north as Brittany, and even in the southwest of England. In countries with warm and humid climates, especially in equatorial regions at the sea-level, the introduction of the Eucalyptus has so far been a failure. There is reason to believe, however, that there are certain species of the intertropical regions of Australia and of the Maylaysian Islands which might be expected to succeed even in the tropics. More than a hundred species are now known, and it is easy to understand that from this number there is a considerable choice to be made, according to the usages for which they are intended. Most of the species are forest-trees, some reaching in a comparatively short time a colossal size. Their principal value, then, is the production of timber, although the value of their wood for fuel is almost as great—a quality which will be appreciated in countries where the absence or high cost of coal is a serious obstacle to the production of metals or to the use of steam-engines.

"Two species may be distinguished among all the others for the rapidity with which they reach a large size; these are *E. globulus* and *E. Mulleri;* and they grow much more rapidly than any of the native trees of Europe. In twenty years these trees attain to the size and height of an Oak a hundred years old. Other species, without growing as rapidly, are still remarkable for the short time they require in which to grow to a size large enough to produce valuable material. Such species are *E. diversicolor, E. marginata, E. crebra, E. botryoides, E. robusta, E. leucoxylon, E. Gunnii, E. viminalis, E. rudis, E. corynocalix, E. rostrata, E. gomphocephala, E. cornuta, E. amplifolia, E. tereticornis* and *E. polyanthema*. The wood of some of these species is exceedingly heavy, and might be used to advantage for blocks for paving the streets of cities."

"The climate is not all that is necessary to insure the successful cultivation of Eucalyptus. The character of the soil is important. Many species, it is true, are not particular in this respect; others, on the contrary, are apparently very fastidious, and if the soil is not suitable to them they grow badly or soon die outright, either immediately after the seed has germinated or in the course of a year or two afterward. It is difficult to say with our present knowledge what they need, although experience seems to show that granite or sandstone soils suit them, as may be seen on the shores of Provence, where such soils are the most common. It is also necessary that the soil in which they are planted should be well cultivated and freed of other arborescent vegetation. The Eucalyptus cannot bear the neighborhood of other trees, disputing the possession of the ground and depriving them of the light of the sun. When it is attempted to grow them in the shade, they become drawn up and give unsatisfactory results. No Eucalyptus can grow on land impregnated with salt, and they all suffer when planted so near the sea that salt spray reaches their leaves. Bright light and a free circulation of air is indispensable to these trees, two conditions made necessary by the large amount of water evaporated from their leaves, for it is well known that the Eucalypti exhale a large quantity of water drawn from the soil drained by their roots. Certain species, particularly those which grow naturally in the most arid regions subject to long droughts, store water in their roots and in the lower part of their trunks, which are sometimes enlarged into a sort of bulb, and from which they draw the water necessary for their existence during periods of excessive drought. It is useless to hope that arid rocky hills can be covered with forests of the large Eucalyptus, which require for their rapid growth an abundance of soil."

"The seeds of Eucalyptus may be planted at different periods of the year, according to regions and climates. With us the best time is the spring—in March, April or May—for if the seed is sown at that time, the young plant will have sufficient strength to support the cold of the following winter. In forming a plantation of Eucalyptus, it is of prime necessity to decide upon the object to be attained, that the species may

be selected best suited to accomplish it. If, for example, it is desired to obtain timber in as short a time as possible, *E. globulus*, *E. Mulleri* or *E. gomphocephala* should be planted. If very heavy wood is desired, then *E. marginata*, *E. rostrata* and especially *E. polyanthema* should be used. If it is a question only of obtaining handsome trees for the decoration of parks or avenues, one would choose naturally the species most remarkable for the beauty of their growth, for the dense shade cast by leaves and by their abundant flowers, such as *E. robusta*, *E. cornuta*, *E. botryoides* or *E. leucoxylon*."

These short extracts will give, perhaps, an idea of the scope and character of Monsieur Naudin's contribution to dendrological science. For the full account of the Eucalyptus, as known in Europe, however, we must refer our readers to the paper itself, which, it seems to us, might with great advantage be reprinted in this country for the benefit of the rapidly increasing class of people whose homes are in southern California, where the cultivation of these trees is every year becoming a more important industry.

Notes.

The Messrs. Putnam are about to publish a "Leaf-Collector's Hand-book," prepared by Professor Charles F. Newhall.

The Russian Department of Agriculture and Farming proposes to introduce the cultivation of the Opium Poppy into the Caucasian region.

Among the pretty names applied by the Japanese to their Chrysanthemums are: "Snow on the Leaf of the Bamboo," "Thin Cloud," "Gold Dragon," "Spray-capped Wave" and "Star-lit Night."

A well of clear water which existed near what is now the city of Dublin was called, in Celtic times, "Fain-Usk," and the name, in a curiously altered form, has been preserved to our own times in that of Phœnix Park.

The Massachusetts Agricultural Society has doubly honored *Spiræa Japonica*, var. *grandiflora*, by awarding it a first-class certificate and a silver medal at recent meetings. It is a new and much improved form of the familiar *S. Japonica*.

Among the most beautiful of the shrubs in Central Park at this time is the Ramanas Rose (*Rosa rugosa*), and especially the white variety. In grace of form, richness of foliage and beauty of flower and fruit, this shrub has hardly a superior.

A correspondent of the *American Florist* writes that the Village Improvement Society of the town of Winchester, a suburb of Boston, has inaugurated the commendable practice of distributing to the school-children flower-seeds and bulbs, with the offer of certain premiums to those who excel in the culture of the same. The children have entered into the scheme with great enthusiasm.

Professor Trelease issues, in a separate volume, from the second annual report of the Missouri Botanic Garden, his revision of the American species of Epilobium growing north of Mexico. Thirty-eight species are described, some of them being now characterized for the first time, and the paper, which is one of the most important of the recent contributions to North American botany, is enriched with forty-eight full-page lithographed plates, showing the habit and structure of the different species.

In that old and curious book, the "Rarities of New England," the Touch-me-not, or Jewel-weed (*Impatiens fulva*), is called the "Humming-bird-tree," and is thus quaintly described: "This Plant the Humming-bird feedeth upon, it groweth in wet ground, and is not at its full growth till July, and then it is two Cubits high and better, the Leaves are thin and of a pale green Colour, some of them as big as a Nettle Leaf, it spreads into many Branches, knotty at the setting on, and of a purple Colour, and garnished at the top with many hollow dangling Flowers of a bright yellow Colour, speckled with deeper yellow as it were shadowed, the Stalks are all hollow as a Kix and so are the Roots, which are transparent, very tender and full of a yellowish juice." Its leaves are declared to be a remedy for the effects of Poison Ivy and to be good for "Bruises and Aches upon Stroakes."

Steps are now being taken by members of the Royal Scottish Arboricultural Society to secure a fund for the foundation of a Chair of Forestry in the University of Edinburgh, and to endow it properly. The subject has been before the society for many years, and has received the cordial support from the most eminent forest-students of the day. During the two last sessions of the University a forestry class has been successfully taught by Dr. Summerville. The interest shown in this course has been considerable, and points to the desirability of establishing in Scotland, on a permanent basis, the study of forestry as a science. Dr. Summerville's lectures have been supported by a grant from the senate of the University, but there is now reason to fear that this aid will be withdrawn unless a permanent endowment fund is provided by local effort. It is thought that $25,000 will be required for this purpose; about $7,500 of this sum have already been received by the University and by the Highland Agricultural Society of Scotland.

From the annual report of the City Parks Association of Philadelphia, it appears that during the past year two parks, Weccacoe Square and Bartram's Garden, have been opened to the public, while two more, Northwood Park and Juniata Park, bid fair to be opened. The final acquisition, after a century of neglect, of Bartram's Garden is an achievement for which all good citizens will be grateful. Four new parks have been placed on the city plan by Councils, and an ordinance was passed last winter providing for grass-plots and the planting of trees along the sidewalks of the streets and avenues of the city, which are seventy feet wide, and over, from house-line to house-line. Other progress has been made in the matters concerning which this association interests itself, and no doubt the work done by it, and the efforts of its individual members, have exercised a marked influence in keeping alive public interest in the necessity of open squares and pleasure-grounds in the city. It is to be hoped that similar associations will be formed in other cities.

The idea so often recommended that winter as well as summer should be considered in the arrangement of country-places, was thus charmingly set forth by Joseph Addison in the *Spectator* for September 6th, 1712: "I can by no means think the verdure of an evergreen comparable to that which shoots out annually and clothes our trees in the summer season. But I have often wondered that those who are like myself, and love to live in gardens, have never thought of contriving a winter garden, which should consist of such trees only as never cast their leaves. . . . When Nature is in her desolation and presents us with nothing but bleak and barren prospects, there is something unspeakably cheerful in a spot of ground which is covered with trees that smile amid all the rigors of winter, and give us a view of the most gay season, in the midst of that which is most dead and melancholy. I have so far indulged myself in this thought that I have set apart a whole acre of ground for the executing of it. The walls are covered with Ivy instead of vines. The Laurel, the Hornbeam and the Holly, with many other trees and plants of the same nature, grow so thick in it that you cannot imagine a more lively scene. The glowing redness of the berries with which they are hung at this time, vies with the verdure of their leaves. . . . It is very pleasant at the same time to see the several kinds of birds retiring into this little garden spot, and enjoying themselves among the branches and foliage, when my great garden . . . does not afford a single leaf for their shelter."

The tenth bulletin of the Central Experimental Farm of the Ottawa Department of Agriculture is devoted mainly to the treatment of the disease known as Apple Scab. This fungus, which has been long known, has come to be so serious in many parts of Canada that orchards of Fameuse Apples which, ten years ago, yielded from sixty to seventy-five per cent. of first-class fruit, now give no more than twenty-five or thirty per cent., the remainder being "seconds" or "thirds." The late Mr. Charles Gibb once stated to the Montreal Horticultural Society that in his orchard the effect of this disease was so marked that his apples brought an average of only twenty-five cents a bushel, while, if they had been free from the spot the same variety would have sold for seventy-five cents a bushel. To this reduction in selling price must be added the loss resulting from diminished size, which is quite as serious, so that the total direct and indirect depreciation of value, when compared with that of first-class fruit, would be about in the proportion of one to four. The bulletin goes on to give an account of the fungus (*Fusicladium dendriticum*), which has been often described, together with an account of experiments to show that carbonate of copper in simple mixture or suspension with water is a very effective remedy. The experiments confirm what has been often stated in these columns, that the application should be made early, that is, the first one should be made before the blossoms open and the second soon after they have fallen. The liquid should be distributed in a fine spray by proper nozzles, and, although the trees do not need to be drenched, they should be completely moistened.

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Matters of Taste.

THE expression, "It is a matter of taste," is often used to signify that no rules or principles can be applied to the subject which is thus indicated, and it is a popular notion that a matter of taste supplies opportunity for absolute choice or caprice, and that one decision or preference is as good and as appropriate as another. But the faculty of discerning beauty, order, congruity, proportion, symmetry and whatever constitutes excellence in landscape-gardening requires cultivation and intelligent direction. The notion that whatever accords with the whims or preferences of the owner is for that reason fit and right, is constantly used to justify all kinds of unintelligent and unpleasing arrangement of the grounds about dwellings.

It is every year becoming more important to obtain general recognition in this country for the truth that in matters of taste, appearance or beauty, pleasing effects do not depend on caprice, but that the character of results is determined by the arrangements and conditions of each particular case—that is, by facts and principles which should be recognized and regarded in practice. Of course there are often matters pertaining to the plan and treatment of the grounds about dwellings which afford opportunity for unrestricted choice. These are usually features or questions of comparatively slight importance, and the preferences of the owner constitute the only standard of judgment which it is necessary to apply. The error which constantly leads to undesirable results is the popular belief that all matters of taste are of this character; that they lie outside of the realm of rules and principles, and that what pleases the owner of the grounds is necessarily good.

If people could be brought to recognize the distinction between the two classes of subjects or questions connected with the arrangement and treatment of grounds about dwellings, the one made up of matters in which one method may be as good as another and the owner's choice is the only law, the other requiring the application of an intelligent and cultivated judgment in order to reach any satisfactory result, it would be the means of greatly improving the appearance of thousands of places, and it would also increase the value of residence property in nearly all the towns of our country. The appearance or effect of permanence, and of the peacefulness and comfort which ought to belong to a home, can be produced only by the adaptation of means and plans to these ends. The position of the house in the grounds, and the relation between its character and that of its permanent surroundings, the disposition of shrubbery and of roadways, and the connection between the lawns and the public streets or highways, are all questions requiring intelligence for their decision. There are principles and laws involved which cannot be safely disregarded, and pleasing effects and impressions can result only from arrangements and combinations which are in their nature adapted to produce them. An unsightly building may be made to appear more distant, and less intrusive and aggressive, by a hedge or line of shrubbery which does not conceal half of its height, and this effect follows whether it is expected and understood or not. A small lawn fronting a public street or roadway which is a wide area of dust, with only a ragged, irregular edging of grass, may have in itself a pleasing effect if it is in some way definitely separated from the street. The limit or barrier may be a slight fence, hedge or wall, but a plain line of demarcation is necessary between the homogeneous and successful expanse of greenery on the one side, and the chaotic domain of ugliness on the other. While the barrier is maintained—it may be a barrier for the eye only—the verdant smoothness of the lawn makes a satisfactory impression. It is so much that has been redeemed from the waste which still exists beyond the wall, and for this outside desolation the lawn is clearly not responsible. But if the limit between the lawn and the street is removed, then the unsubdued ugliness of the street becomes a part of the lawn, and the lawn is dominated and dwarfed by it, and appears unfinished and unsuccessful.

An Interesting Rediscovery.

MRS. J. G. SMYTH, of Greenville, South Carolina, sends us fresh flowers of *Lonicera flava*, gathered by herself on Paris Mountain, probably in the very spot where this plant was last seen growing wild by any botanist. This was in the year 1810, when John Fraser, a Scotch collector, paid a visit to Paris Mountain and gathered seeds or roots of this plant and sent them to England. From the descendants of these plants of Fraser's kept in gardens has been preserved the knowledge of this beautiful species. Last year a figure and description of *Lonicera flava* were published in this journal (vol. iii., 187, f. 187), and the interest this excited in what appeared to be a "lost plant" led our correspondent to investigate Paris Mountain, a low outlying spur of the Blue Ridge which rises from the plain close to Greenville. Her search was successful, and on the 27th of April Mrs. Smyth found the Honeysuckle in flower, and now sends us specimens with this note:

The plants were found, and this was the only place, on the north side of the mountain, a hundred and fifty or two hundred feet from the top or highest point of the mountain, which is 2,054 feet above the level of the sea. The Lonicera was growing in a very rocky place, about fifteen or twenty feet square, a place which looked, except for the many and large rocks scattered over it, as if it might have been a cleared spot. All around and about it the original foliage of the forest had never been disturbed, tall Oaks and Chestnuts, and the thick undergrowth of Azaleas and Rhododendrons forming a dense shade. The soil is rich and black from the long accumulation of leaf-mold, damp and rich, and just such a soil as the Rhododendron grows and thrives in. The stems are not more than two feet high, but I thought would have grown longer if there had been any support for them to cling to and run on. The roots send out long runners, and these send up shoots from every little point, so that in trying to get a root one might pull up yards and yards before it would break.

Lonicera flava is one of the rarest of American plants, and although it has been known from the very beginning of the century, there is apparently no evidence that it grows anywhere except in this one spot on Paris Mountain. Mrs. Smyth's most interesting discovery removes another from the now short list of plants known to our early botanists, but unknown to their successors. Now that Darbya, Shortia and *Lonicera flava* have been found again, *Gordonia Altamaha* and *Illicium parviflorum* are the only prizes left among species known to have existed to reward the botanical collector in the south Atlantic states. It is a curious fact that both of these plants, like *Lonicera flava*, have been preserved in gardens for nearly a century, although all recent efforts to find them in their native haunts have failed.

In another column of this issue a correspondent expresses a mild disappointment in the gardens of Bermuda because they fail to display that richness and variety of material which one would expect to find in such favorable soil and climate. No doubt there is some justice in this criticism, but the same is true of the gardens in nearly every other portion of the civilized world. The fundamental error usually consists in ignoring the peculiar natural conditions of the place and endeavoring to construct a garden or to modify a landscape in accordance with some foreign ideal. The perfect English lawn is a delight to every one who sees it under English skies, but over a large portion of the world greensward is unknown and impossible, and in such places it is worse than a waste of energy to strive for any garden effects in which a stretch of clipped grass is the prevailing feature. And even in certain regions where grass might be persuaded to grow with careful nursing such lawns may be misplaced, as, for instance, among the rocky ledges, dwarf Cedars and scrub Birches of our wild north-eastern coast. In the same way a sub-tropical garden rarely looks happy in the north, even during the heat of our short summers, and if this tender vegetation could be induced to thrive it would still appear misplaced among the sturdy trees and shrubs and herbs which look fearlessly forward to the approach of winter.

The true method everywhere, and this is the first canon of all garden art, is to study the native and peculiar beauty of the place and then endeavor to unfold and enhance it, resisting every temptation to give it an alien air by decorating it with foreign and incongruous finery. This is the fundamental charm of all the famous gardens of the world. The English lawn itself is beautiful in England because it is the legitimate outgrowth of English natural scenery, while the Park of Muskau and the gardens on the shores of the Mediterranean emphasize the same teaching. In every successful instance art comes to the help of nature, working in accordance with the informing spirit of the scene. Wherever, on the contrary, attempt is made to oppose or thwart nature the end will be disaster. It would not be strange if the Bermudians had committed some errors of this sort. If they have endeavored to provide themselves with English gardens in a latitude south of that where the finer grasses thrive, their lawns will give them little satisfaction. It would be a natural mistake on their part to try the strictly tropical plants which clothe some of the West Indies with such luxuriant beauty, for they have intimate commercial relations with these islands, and, of course, are familiar with their flora, but Tree-Ferns and Crotons could hardly endure the chill of the more northern islands. Again, these islanders are in the habit of visiting our northern states in summer, and, after enjoying the singular beauty of our flowering shrubs and trees and hardy plants, they have endeavored to naturalize many of them. Here, too, failure was inevitable. Plants which can endure a long winter are rarely hardy enough to survive an almost endless summer, and, therefore, most of the Hybrid Perpetual Roses and scores of shrubs and trees from our nurseries have been planted in Bermuda only to perish.

But, although mistakes may have been made in planting on these islands, we must acknowledge quite as serious and even more prevalent errors at home. Taken as a whole, Bermuda scenery has a singular charm for northern eyes, and the possibilities of gardening there are endless. Most of the delightful plants which thrive just outside the borders of the tropics would here make themselves at home, and, having been developed in similar climatic surroundings, would blend harmoniously with the native growth. Olives, Laurels, Myrtles, Magnolias, Rhyncospermums, Laurestinus, Gardenias and Pittosporums, with Cycads, Yuccas, Aloes, Agaves, Euphorbias and other plants which brighten the gardens of southern Europe, ought to thrive here. The Cherokee Rose, if introduced, might soon be as common as it is in our southern states, while *Pinus Cubensis* and other southern conifers ought to live happily among the native Cedars.

But, after all, there are only a few chosen spots in all the world where the art of the gardener is so little needed as it is here to supplement the beauty with which nature has already endowed them. Instead, therefore, of regretting that man has done no more to enhance the beauty of these islands, we ought to be grateful that he has done so little to mar it.

Sir Christopher Wren as a Gardener.

One usually connects the name of Sir Christopher Wren only with the erection of city churches, but he deserves at least a little niche in the memory of those whose chief concern is with plants and with the useful or ornamental disposition of the surface of the ground. I cannot discover what share he may have taken in arranging the grounds of the country homes he built or altered, but we can fancy that he may have been active in this direction, for the art of gardening was then still in its strictly formal phase, the immediate surroundings of great country houses were architectural in design, and clients were wise enough to know that the same artist who planned the structure itself should be consulted about its accessories. Moreover, there is historical witness to the fact that once at least he shared in the arrangement of a famous garden. About the year 1690 Queen Mary engaged Wren to make alterations in Cardinal Wolsey's former palace of Hampton Court; and, though I cannot find any detailed account of what his work on the gardens was, it is known that they were included with his purely architectural problems. "Queen Mary," says Wren's latest biographer, Miss Phillimore, "though she amused herself with planning the gardens and making suggestions, had yet the wisdom to defer to Wren's better taste and knowledge. Her husband, with characteristic obstinacy, insisted on his own ideas, thereby dwarfing the cloisters and marring much of the architecture. It is, however, fair to say that King William always owned that the defects were his, the merits Wren's; and these merits were very great as any one who knows the fine old palace, with its rich red brick, its arcades and the quaint formal gardens, will readily allow. He built, at about the same time, the Pavilion and the Ranger's House in Bushey Park."

But it is in Wren's writings that we find what will be of most interest to the readers of Garden and Forest. No man ever worked harder at his own profession than he, even during the later years of his long life; yet he found time to investigate many other intellectual questions and occasionally to write about them. An article, "On the Surface of the Terrestrial Globe," is mentioned by biographers, but is no longer extant. Another, however, "On the Rising of Sap in Trees," has been preserved. In full it exists only, I believe, in a manuscript inserted in a volume of the "Parentalia," a folio book of family memoirs published by Sir Christopher's grandson, and now itself a rarity. But some extracts from it are printed by Miss Phillimore and are valuable as showing how such a subject was approached, just two centuries ago, by a man who, although he was not a naturalist, had one of the acutest and most cultivated intellects of the time.

"It is wonderful," writes the great architect, "to see the rising of the sap in Trees. All will bleed more or less when they are tapped by boring a hole through the Bark, some very considerably, as the Birch, which will afford as much liquor every day almost as the milke of a cow; in a Vine when a bough is cut off it will if not stopped bleed to death. Now by what mechanism is water raised to such a height as in Palmitos to 120 foot high? A skillfull Engineer cannot effect this with-

out great force and a complicated engine, which Nature does without sensible motion; it steals up as freely as the water descends; the reason of this is obscure as yett to naturalists." Various theories which Wren then quotes are not explained by his biographer, but, she tells us, he shows by a little marginal drawing "that the onely Vicissitudes of heat and cold in ye aire is sufficient to raise the sap to the height of the loftiest trees." Mechanical explanations are then given to refute the idea that there is "a secret motion in nature contrary to that by which plants aspire upwards." And in conclusion Wren says: "But though I have shown how the sap may be mechanically raised from the Root to the top of the loftiest trees, yett how it comes to be varyed according to the particular nature of the Tree by a Fermentation in the Root; how the Raine water entering the Root acquires a spirit that keeps it from freezing, but also gives it such distinguishing tastes and qualities, is beyond mechanical Philosophy to describe and may require a great collection of Phenomena with a large history of plants to shew how they expand the leaves and produce the Seed and Fruit from the same Raine water so wonderfully diversified and continued since the first Creation."

Special students of such questions would be glad to see the explanatory passages omitted from these quotations, although, of course, we can understand how they did not find a place in a general biography of the architect. But it is certainly interesting to discover that a man so practical and sensible as Wren, seems to have anticipated a day when even such secrets as the transmutation of inert into living matter would be explained. Unfortunately, our "collection of Phenomena" and our histories of plants, vastly though they have increased during the past two centuries, have brought us no nearer to the reading of riddles of this sort.

When discussing the condition of the churches of London and the best way of repairing them, Sir Christopher once wrote: "As to roofs, good oak is certainly the best, because it will bear some negligence. The churchwardens' care may be defective in speedy mending drips; they usually whitewash the church, and set up their names, but neglect to preserve the roof over their heads. . . . Next to oak is good yellow deal, which is a timber of length, and light, and makes excellent work at first, but, if neglected, will speedily perish; especially if gutters (which is a general fault with builders) be made to run upon the principal rafters, the ruin of the church may be sudden. Our sea-service for oak and the wars in the North Sea make timber at present of excessive price. I suppose, ere long, we must have recourse to the West Indies, where most excellent timber may be had for cutting and fetching."

Wren lived, as I have said, before the time when naturalistic methods of gardening art were introduced, and very long before the establishment of great rural cemeteries for the reception of the dead of cities. In his day it was customary to bury in churchyards and actually within the walls of churches, even in the densest parts of London. But he was too intelligent a man not to protest against so dangerous a practice, and, in one of the many reports on architectural and urban questions which he wrote, we find what his conception was with regard to the proper disposal of the dead. If they are not interred in or near the city churches, he says, "It will be enquired, where then shall be the burials? I answer, in cemeteries seated in the outskirts of the town. . . . A piece of ground of two acres in the fields will be purchased for much less than two roods among the buildings; this being enclosed with a strong brick wall, and having a walk round, the two cross walks decently planted with yew trees, the four quarters may serve four parishes, where the dead need not be disturbed at the pleasure of the sexton or piled four or five upon one another or bones thrown out to make room. . . . It may be considered further, that if the cemeteries be thus thrown out into the fields, they will bound the excessive growth of the city with a graceful border, which is now encircled with scavengers' dung-stalls." To-day we should hardly consider such cemeteries a "graceful border" to a city, although, it must be confessed, too many in America are encircled by the more unpleasant heaps of refuse with which Sir Christopher desired to do away. His words convey, I may add, an exact picture of many cemeteries still in use near European towns; but, though they are much larger than the churchyards which preceded them, the horrible results of overcrowding cited by Wren as existing in such yards may often be witnessed within their wider yet now insufficient and inelastic walls. I have myself seen, in German cemeteries in the outskirts of cities of the first class, even the piling of three or four bodies one upon another, and this not in portions devoted to the poor, but in lots owned by aristocratic families.

New York. *M. G. Van Rensselaer.*

Native Shrubs of California.—VI.

AGAINST the five or six native species of Plum with which the Atlantic states are credited, the Pacific coast has only one, though this appears in different localities under two very well marked varieties. The type is *Prunus subcordata*, Benth. (Pl. Hartav., 108). The variety *Kelloggii*, Lemmon (Piltonia, ii., 67), is not well known, and may possibly, at some future day, be admitted in the rank of a species. But the species, in the typical form, is common in many parts of California, though along the seaboard it is so rare as to have escaped the notice of all the early explorers, Menzies, Chamisso, Douglas, and even Nuttall. Not until the year 1847, when Hartweg botanized up the Sacramento to the foothills of the Sierra, was our Wild Plum brought to the knowledge of botanists.

It is a common observation that, in many genera of plants common to the Old World and the New, it is the Pacific coast species, rather than those of Atlantic America, which make the nearest approach to Old World types; and this holds good in respect to the Californian Plum. It is more intimately related to *Prunus domestica* and other European or Asian Plums than are any of the Atlantic coast species. Indeed, the Atlantic group, by their divergence from the Plum-tree genus in one or two particulars, were what led certain eminent botanists to regard Plums and Cherries as congeneric. In the Old World the Plums, as a genus, have this fine mark, that their leaves are rolled up from edge to edge in the bud, while the Cherries all have theirs folded together lengthwise. But all the Plum-trees indigenous to Atlantic North America have been found to agree with the Cherry-trees in that their foliage is conduplicate in the bud. Our *Prunus subcordata* is not at agreement with its American cousins in this regard, but has that rounded foliage, convolute in the bud, which betrays its closer affinity with the species of another continent. In the color, texture and flavor of its fruit it is, however, quite like the other American Wild Plums, and the quality is variable, according to the locality. And, although exotic Plums are cultivated with all success in almost every part of California, the improvement of our native species has not been neglected. In some instances cultivated seedlings from this parentage are said to have already yielded fruit very superior in size and quality to the last products of the wild tree.

As above intimated, the shrub is not common except in the lower altitudes of the Sierra Nevada. There, and especially toward the northern parts of the state, it is plentiful along streams, where, attaining the shape and dimensions of a small tree, it forms considerable thickets, and, in places remote from the older and fruit-growing settlements, the wild plums are valued, and are, in fact, not far inferior in quality to some of the domestic sorts. In the coast range I know of no locality where the species is at all common. One small clump of it, in a cañon a few miles east of Oakland, and another on the grounds of the University at Berkeley—in a secluded nook, where it is no doubt spontaneous—are all I have been able to record as Bay-district stations for it. These bushes flower in March, and the blossoms, of rather large size for those of a wild Plum, in fading assume a rosy tint, such as I have not otherwise noticed in Plum blossoms.

Neither the Atlantic slope of North America nor the Pacific slope proper has any native species of the Peach and Almond genus, Amygdalus; but the Mexican region, including its northern extension, the Interior Basin of the United States territory, has, perhaps, three or four. At least one of these, *Amygdalus Andersonii*, Greene (Fl. Fr., 49), comes within the borders of California, east of the Sierra Nevada, and is no rarity among the rocky hills and mountains which enclose the great Colorado Desert of the southern counties. The shrub was first made known to botanists under the generic name of Prunus, and hence it has been called the Desert Plum. But whoever sees it in flower will recognize it at a glance as congeneric with the Peach and Almond, rather than with the Plums. When out of bloom it is about as inconspicuous as other desert shrubs, for the foliage is both small and sparse. Its associates are the smaller Agaves, Yuccas, and the bristling Opuntias and other Cacti which prevail in those verdureless and almost rainless districts; and then, rooted firmly in the scant soil of crevices and fissures of sunburnt rocks, in February it clothes itself with a fine display of rose-red blossoms, and so becomes an ornament to a hard landscape otherwise enlivened at this season only by the red and yellow of certain Cactus-blossoms. The shrub is low and bushy, perhaps seldom attaining a man's height; and to its flowers there succeed in their season the small velvety drupes, scarcely more than a half-inch long, which, when ripe, divest themselves of their

thin fleshy external coat, after the manner of the common Almond, and expose a small, nearly smooth putamen, or nut. I have not heard of any attempts to cultivate this native Almond, either in the fertile and fruitful regions of California proper or elsewhere. It is even something of a rarity in the herbariums of the botanists, though this is owing simply to the fact that the desolate and uninviting regions which it inhabits are so seldom visited and so little cultivated by even the most zealous of botanical collectors.

University of California. *Edward L. Greene.*

New or Little Known Plants.

The Japanese Hamamelis.

THE Witch Hazel (*Hamamelis Virginica*) of eastern America, with its bright yellow flowers which cover the branches late in the autumn as the leaves, which are then orange and scarlet, are falling, is one of the most common and best known of our woodland shrubs or small trees. The genus is confined to eastern America, where a single species occurs, and to eastern Asia, with a Japanese species, and another which has been discovered recently on the mountains of central and western China. The characters which are used to distinguish these plants are not important, and to botanists, who look to species largely, and do not give great weight to geographical distribution as a factor in their establishment, the three Witch Hazels might be considered forms of one species, slightly differentiated by local surroundings.

Hamamelis Japonica (Fig. 45), as it appears in the Arnold Arboretum, can only be distinguished from our American plant by its rather smaller and somewhat thicker, more prominently veined leaves of a duller green on the upper surface, and by the fact that the flowers appear in February or in early March instead of in the autumn. The number of the nerves of the leaves by which Siebold & Zuccarini (*Sitz. Akad. Münch.*, iv., ii., 193) endeavored to distinguish the Japanese from the American species is variable, as has already been pointed out by Franchet & Savatier ("Enum. Pl. Jap.," ii., 368); and in our cultivated Japanese plant the leaves are very constantly five or six-nerved, like those of the American species. The color of the inner surface of the calyx-lobes has also been used to distinguish the Japanese plant. On many of the plants cultivated in Europe, and in the wild specimens gathered in Japan which I have seen, the inner face of the revolute calyx-lobes is dull red. The effect of the contrast between the red color of the calyx and the bright yellow of the petals is striking and handsome, and makes this form the most attractive, probably, of the Witch Hazels at the time of flowering. But this color of the sepals does not seem to be constant. On the plants in the Arboretum, which were originally derived from Segrez, the interior of the calyx is dull yellow-brown, and the flowers can hardly be distinguished from those of the American plant except in their rather smaller size. Another difference between the Japanese plant, as it appears in the Arboretum, and the American species is found in the size of the persistent fruiting calyx, which in the Japanese plant is confined to the base of the fruit, while in the American plant it varies from a third to half the length of the capsule. The relative size of the mature calyx to the fruit appears to vary, however, on different individuals, and therefore does not afford a character of much value. Siebold & Zuccarini (*l. c.*) found that the calyx was attached to the base of the fruit only; Sir Joseph Hooker (*Bot. Mag.*, t. 6659) found the same to be true on all the specimens he was able to examine, while Franchet & Savatier (*l. c.*), on the contrary, remarked that "in all the specimens of *H. Japonica* with ripe fruit that we have before our eyes the degree of adherence of the fruit to the calyx differs from a quarter to nearly a half; not one of them is attached by the base only; and it is not possible to consider this peculiarity as a specific character." Franchet & Savatier speak of the flowers of the Japanese and of the American species as identical, and it is possible, although hardly probable, that the flora of Japan may contain two species—one with the red calyx of the plant, which seems to be the only one cultivated in England,* and the other with the yellow flowers of the plant which is figured on page 257. It is interesting in this connection as bearing, perhaps, on the tendency of Hamamelis to vary in the color of its flowers to note that I have recently received flowers of the American Hamamelis with bright red petals found on a wild plant in Malden, in this state.

Hamamelis Japonica is described as a small tree in its native country. Here it forms a spreading shrub of straggling habit, four or five feet high, with stout ashy-gray branches which are at first pubescent but become glabrous in their second year, and marked, like those of the American species, with small pale lenticels. The leaves are obovate, sinuately crenate and sharply toothed above the middle, five or six-nerved, rounded or acute at the apex, wedge-shaped or contracted into a narrow rounded base, long-petioled, with prominent midribs and nerves grooved on the upper surface. They are dark green and glabrous above, and are coated on the lower surface with pale or rufous persistent pubescence, and are from two to two and a half inches long by an inch or an inch and a half broad. The flowers are produced in subsessile clusters. The calyx is a quarter of an inch across, with lobes which are rounded at the apex, slightly ciliate on the margins, dull orange-yellow, and reflexed at the flowering period. The petals are strap-shaped, three-quarters of an inch long, rounded or truncate at the apex, and bright canary yellow. The filaments, like those of the American plant, are short and stout, the fertile anthers opening from the front. The carpels are silky-pubescent, with filiform styles. The capsule is subglobose, rather less than half an inch long, covered with bright brownish tomentum, and surrounded at the base only with the remnants of the calyx.

Hamamelis Japonica grows very slowly here, and, from present appearances, will never become a tree. It is very hardy, and the first shrub of the year to flower in the Arboretum. The flowers are bright and cheerful, and their earliness gives to this plant considerable value as a garden-plant, apart from the botanical interest which is attached to it. The red-flowered form is not in the Arboretum, but, judging from the figures which have been published of it, it is a more desirable garden-plant than the form which is figured in this issue, and the most showy member of the genus. *C. S. S.*

Ravenea Hildebrandtii.

THIS elegant little Palm was discovered in the Comoro Islands, between Madagascar and Zanzibar, by the German collector after whom it is named, and was introduced by means of seeds into the Berlin Botanical Gardens for 1878. Two young plants were obtained from that establishment for Kew in 1879, and five years afterward one of them, a male, flowered and was figured in the *Botanical Magazine*, t. 6776. Shortly after this the second plant flowered and proved to be a female; the photograph reproduced on page 259 represents the latter in fruit here in February last. This plant is only four feet high, and it has a naked stem a foot long, by one and a half inches in diameter, with an onion-like base. The leaves are a yard long by two feet across; the pinnæ are smooth, pointed, dark green on both sides; the petiole channeled and covered with gray furfuraceous scales. The female spadix is slender, four feet long, with an elegant panicle, bearing pea-like fruits of a bright scarlet color. These remain on the plant several months, and as they are ornamental they add considerably to the beauty of the plant. Mr. Wendland, of Hanover, informs me that he has obtained several crops of perfect seeds from his plants by placing the male inflorescence upon the female plant when in flower. This Palm is as elegant as *Geonoma gracilis* and as sturdy as a Kentia. It deserves to take a prominent place among garden Palms,

* This is the *Hamamelis arborea* of Masters (*Gardeners' Chronicle*, 1881, 216, f. 38), which is referred by Hooker to *H. Japonica*.

Fig. 45.—Hamamelis Japonica.—See page 256.

its small size, free habit, elegance, good constitution, being all in its favor, while in the freedom with which it flowers and produces seed we have an exceptional character among dwarf Palms.

According to Hildebrandt it ultimately forms a tree six to eight feet high, and it grows on the mountains of Comoro at an elevation of about 4,000 feet.

Kew. *W. Watson.*

Foreign Correspondence.

London Letter.

A LONG and exceptionally trying winter has at last come to an end, and has been succeeded by weather which, for warmth and brightness, equals anything we usually experience here in midsummer. Nearly a fortnight of this excessive warmth has produced a change in the garden quite magical in its suddenness, for the gloomy appearance worn by every tree and shrub and herb a fortnight ago has given place to a wealth of healthy green leaves and gay flowers everywhere. Never were the orchards of the London market-gardeners so heavily laden with flowers. Plums, Cherries, Apples, Pears, in fact, all kinds of fruits, have flowered so abundantly, and in some cases set so well, that already the prophets have foretold a ruinously heavy harvest of fruits. The orchard is the most beautiful part of the garden now, far more beautiful, indeed, than any other part ever is. This leads one to again call the attention of garden-makers to the value of many of these fruit-trees in purely decorative gardening. Where such trees as the Almond, double Peach, double Cherry, and several of the Plums and Crabs are used the effect at this time of year is charming. But we need not stop at the double-flowered and rare species of these. There is no more beautiful tree than an old Apple heavily laden with its big bunches of pink blossoms; but who ever plants the Apple for the same purpose as the Lilac and Laburnum?

Daffodils of all kinds and in all sorts of places—on beds, in grass, by the side of the lake and in tufts among the collections of shrubs—have been very effective; as also have Hyacinths, Tulips, Anemones and Ornithogalums. English gardening has developed very considerably in the direction of out-of-door spring flowers. We have almost entirely left the ancient practice of attempting to grow flowers only in set beds in summer, and allowing the garden to lie undressed for the remainder of the year. There is abundant material with which, by a little management, a garden may be made interesting and beautiful from January to December. Bulbs play an important part in this as a matter of course, although we are by no means limited to them. We had the Spurge Laurels, the Witch Hazels, the yellow Jessamine, the beautiful Forsythias and many others long before the Primrose and the Snowdrop came. These were followed by Magnolias, Brooms, Rhododendrons, the Daffodils and such like heralds of spring. Now there is a great wealth of flower attractions everywhere, Lilacs, more Rhododendrons, the chaste Exochorda, Choisyas and Kalmias. Besides these, the out-of-door beds are gay with the flowers of *Milla biflora*, a charming plant for carpeting small beds such as surround specimen shrubs on lawns; Muscari, several species, most effective when used like the Milla; Irises, Primulas, especially *P. Japonica*, one of the most beautiful of all spring flowers, and as happy in an English garden as the common Primrose. Species of Tulipa are employed for furnishing small beds, and they are, at least, as pretty in color-effect as the most brilliant of the common kinds. The garden is the most pleasant place in the world at this time of year—that is, a well-furnished, nicely arranged garden, wherein the birds come to live and sing all day, and the plants have some new surprise for us almost every morning. Eternal spring might not be delightful, but spring after the frost and smoke and fog of last winter is most enjoyable. When the sun shines long and warm the plants in the houses soon wake up and rush into vigorous growth, so that houses vie with the garden in the open air in interest at the present time.

At Kew there are many noteworthy plants in flower, and perhaps I cannot do better, this week, than enumerate some of the most interesting.

Amorphophallus campanulatus seems to have excited some American horticulturists recently, and it excites most people here, too, when in flower, for the fœtid odor of its large bell-like inflorescence is most repulsive. There are a dozen or more flowers of it open in the stoves at Kew, as well as plants bearing only the large umbrella-shaped leaves. The largest examples have a spathe about nine inches long and a foot across, and colored green, mottled with gray, except about the mouth, where the color is lurid brown; the large misshapen spadix entirely fills the centre of the bell and is colored dark brown.

Phyllocactus.—This genus of Cactus has at last found favor with some of the leading English horticulturists, and there is therefore a prospect of its becoming as popular in gardens as it deserves to be. Cacti are neglected because they are not known. Many of them lack the qualities essential in a good garden-plant, but there are also many which possess them to the fullest extent. Phyllocactus is a case in point; no plants are more easily grown, none flower more freely, while in size, form and richness of the color of the flowers they are as grand as Tree Pæonies. At Kew there is a large collection of kinds, and many of them are in flower now. There are crimson, scarlet, rose, pink, white and cream-yellow varieties, some as large as the flower of the Victoria Water Lily, others only a little larger than the Epiphyllums. The French and German growers have raised many beautiful kinds of Phyllocactus, but one of the best—namely, J. T. Peacock, which is a giant and of the richest colors—was raised in England by the man after whom it is named.

Cineraria cruenta and C. lanata (aurita) are charming plants in the greenhouse at this time of year. They have all the beauty and elegance of the best of the Michaelmas Daisies, and they are as easily managed as the common Cinerarias. The first-named is the progenitor of all the big-flowered popular varieties, which find universal favor, while *C. lanata*, so far as I know, has never altered in character since it was first introduced from the Canary Islands, nearly a hundred years ago. Its flowers are each about as large as a shilling, white, with mauve tips, and they are very fragrant. I recommend these two plants to every one interested in beautiful-flowered plants for the cool greenhouse.

Aristolochia Goldieana is again in bloom. It is a most extraordinary plant, the size and form of the flower being quite sensational. It would be easy for a man to hide his head completely in the upper part of the flower, which, in shape, resembles an old-fashioned Dutchman's pipe. As in the case of many other gigantic and wonderful plants this Aristolochia is a native of tropical Africa, where, in the region of Old Calabar, it was first discovered and sent to England by a missionary some twenty years ago.

Rosa simplicifolia has apparently become quite established in a cool sunny greenhouse here, where there are two large bushes of it in the most perfect health and flowering freely. Although never likely to become a popular garden plant, yet it is a most interesting Rose, the character of its stems, its monophyllous leaves, suggesting some species of Berberis rather than a Rose, and its small, deep yellow flowers being altogether exceptional among Roses. Probably the hybridist may be able to make something of it, for in habit it is a perfect garden plant, and its leaves are elegant and pretty in color, being a glaucous, almost silvery green.

Solanum Wendlandii.—This plant is now magnificent. It is certainly one of the very finest of large stove climbers, its habit being to branch freely, and on the end of every branch there is produced, in spring, a large cymose raceme of rich lavender-blue flowers. It appears to prefer a sunny, moist, tropical house where, if possible, it should be planted in a bed of rich soil. It will continue to flower all summer.

Streptocarpus.—These plants have sprung into popularity with a bound, a result largely due to the foresight and skill of Messrs. J. Veitch and Sons, who have taken them in hand and crossed and recrossed all the best of the varieties originated at Kew. This year the seedlings at Chelsea are a great advance on anything previously seen, some of the flowers almost equaling Gloxinias in size and colors, while the foliage is much more convenient than it was in the first hybrids raised. There can be no question now of the merits of this Cape genus of *Gesneraceæ*. The progress already made with them is remarkable, and if Mr. Heal, Messrs. Veitch's clever hybridizer, can go on improving them at the present rate, we may soon see Streptocarpus rivaling, if not eclipsing, Gloxinia itself.

London. *W. Watson.*

Cultural Department.

Notes on Shrubs.

FLOWERING Cherries and the flowering Crab-apples have blossomed unusually well in the vicinity of Boston this season, the Apples being particularly noticeable for the fullness of their bloom.

One of the very earliest of Cherries to blossom was the Chinese *Prunus tomentosa*, the seed of which was received at the Arboretum from the mountains about Pekin, China. It is a bushy little plant, which appears to be at its full size when from six to eight feet in height and with fully as great diameter. Its earliest blossoms this season began to open about the 20th of April, and at the same time the leaves were well advanced. As the flowers are sessile, or nearly so, and are partly concealed by the growing foliage, they are not so graceful or showy as those of some other species. Its fruit, however, gives

Fig 46.—Ravenea Hildebrandtii in Fruit. See page 256.

promise of usefulness, as the medium-sized, light red-colored cherries which it bears are of quite a pleasant flavor even in this wild state. The stone is rather large, but by cultivation and selection the size of the cherries could be increased, and small-seeded farms adopted and propagated by division. The extremely early-flowering habit has usually prevented a large crop of the fruit here on account of cold weather and frosts which occur at the time; but, otherwise, the plant seems perfectly hardy in a winter like our past one. Last year the plants appeared somewhat injured, although the winter was not considered nearly so severe and the cold was not so great. Apparently, the injury then was due to other causes besides cold alone.

There is so much confusion regarding the nomenclature of the ornamental Japanese Cherries which have been introduced into cultivation that it is almost impossible to know exactly what kind or form will be received when ordering from different nurserymen. There are two distinct types of these plants, and they appear to pass interchangeably under a dozen different names. Both are often considered by botanists as forms of the Chinese and Japanese *Prunus Pseudo-Cerasus*. Whatever their origin may have been, they are certainly quite distinct from a horticultural point of view. The earliest-flowering of the two opened its first flowers this season in the last days of April and first week in May, before any of the leaves appeared. These flowers are large and semi-double; the buds, or outer petals, are deep pink or red, and the opened flower pinkish white within, which soon turns to a distinct rose-color, that deepens with the age and fading of the flowers. The leaves come out when the blossoms are fading. They are of a very dark green color, tomentose above and beneath, the pubescence being very dense on the under side. This is the plant which, besides many other names, is often sold as *Prunus Watereri*. It is the most showy and ornamental of those introduced here.

The other form of these Japanese Cherries does not begin to open its blossoms until at least ten days after the first form, and when the latter one is in full bloom the blossoms of the early one have faded. The flowers of the late one are pure pearly white, with rarely the faintest suggestion of pink, but there is a variation with the outer petals distinctly rosy-colored. As the flowers fade they do not change to the dark rosy color of the other. The leaves are light green, and they are already large and well developed before the blossoms appear. They differ markedly from the other form in being perfectly smooth or glabrous on both surfaces. This form is not nearly so floriferous as the early-blooming kind, and, although very beautiful, its flowers are much hidden by the foliage. Among other names this is often sold as *Prunus Sieboldi flore albo pleno*, or *P. Sieboldi flore roseo pleno*, according as the blossoms are pure white or have the outer petals of a pink or red color. It is apparently the *Prunus serrulata* of Lindley.

These double-flowering Chinese or Japanese Cherries should not be planted with the expectation that they will become large trees, for, although they have the single-stemmed tree form, they do not attain the height of many of our native plants which are classed as shrubs.

Arnold Arboretum. *J. G. Jack.*

The Hardiness of Japanese Bamboos.

THE Bamboos, the noblest of all the grasses, have not only the merit of utility, but the growth of many varieties is characterized by such grace and distinction that they are among the handsomest ornaments of gardens and plantations. Lately much attention has been given to some of the Japanese varieties, among which may be found widely distinct habits, ranging in height from three feet to forty feet, and with foliage varying both in breadth and color. In a small state many of these varieties are useful, grown in jars, for in-door decoration—a use to which they are much put by the Japanese. Florists will find these useful additions to their stock of decorative plants, as they are not only light and graceful in effect, but they will help to break the monotony of the Palms. But their beauty is better shown when grown in large masses in the open air; where rightly placed, they have capabilities of striking effects in the landscape. *Bambusa Metake* has been long known in gardens and is of undoubted hardiness, but there are numerous Japanese varieties which are now obtainable, and many of them will be of great value if they prove entirely hardy. Most of these are said to come from the warmer parts of Japan, but I have been much encouraged, in testing a small selection of varieties last winter, to believe that many of them are hardy in this latitude, and require scarcely any protection. The varieties tested were planted early last spring, and, while apparently well established, they made no great vertical growth. They were in rather stiff loam, where no stagnant water could remain at the roots. They remained during the winter without any protection to the stems and with no mulch over the roots. Six of the seven varieties exposed passed the ordeal safely and are now making vigorous growth. There was, however, an apparent difference in their resistance to severe weather, but this may have been due to less-matured growths. The past winter was not extremely cold, the thermometer only once dropping to zero, but was a fairly average one as to temperature and moisture. They having lived through this without the slightest protection, there seems no reason to think that they will not pass safely through an exceptionally severe winter if the roots are well protected by mulching. It might also be well to provide wind-breaks, though the foliage of most of the varieties could not probably be preserved during an ordinary winter under any protection in this climate. Such varieties as *B. Ragamowski* may be an exception in this regard, since they have hard, firm leaves which would be retained if protected from scorching. *B. Simoni* also has persistent foliage. In detail, the varieties tested are given in the order of apparent hardiness.

B. Simoni, leaves quite persistent, and plant untouched. *B. viridi-glaucescens* and *B. aurea* lost their leaves, but the stems were untouched. *B. Ragamowski* had its leaves scorched. *B.* (*Arundinaria*) *quilioi* lost its leaves, and its stems were slightly touched. *B.* (*Phyllostachys*) *nigra* (Korochiko of Japan), top killed, but now pushing from the roots. This black-stemmed variety is said to attain a height of thirty feet, which would indicate more vigor than it has shown with me.

B. angulata (variety with knotty joints) was entirely broken up, root and branch, by the frost. *B. Castilloni* (Kimmeichiku of the Japanese) was grown in the house, but is apparently as vigorous as the hardiest ones. Bamboos do not often show their distinct characteristics before the second year, and should be planted in permanent quarters. They form thickets by pushing out horizontal short-jointed stems in every direction. These emit roots, and break at every joint, so that a well-established plant soon becomes the centre of a large clump.

Of course, as these plants grow tall, conditions may arise which would prevent their being hardy in this latitude. For instance, an exceptional winter might cut the top growth severely if not matured, but the root-action is so strong that there seems little doubt that the damage would be confined to the tops even in the worst seasons.

Elizabeth, N. J. *J. N. Gerard.*

Wild Flowers around St. Louis.

THE variety of wild flowers in this immediate section is interesting though much smaller than in New England. The species are repeated more than in the east, due to the sameness of the soil and situations. *Phlox pilosa*, now in flower, is a handsome species, hardly excelled by any other of the perennial class in the richness and variety of shades of its flowers, which vary from a pinkish purple to a rosy red, and occasionally almost white. It grows usually in tufts from ten to fifteen inches high. It transplants better than the other species, for, by taking plenty of soil with its roots, it may be moved when in full bloom without wilting at all. It will thrive in any ordinary garden soil. *Oxalis violacea*, though not very abundant, is common here, and the flower is rich pinkish purple or violet-tinged. It is not very lavish in blooming, and one seldom sees more than two at one time on a stem, and I have never noticed more than one stem to a plant. It grows in thinly shaded places. The Dwarf Larkspur (*Delphinium tricorne*) has been in flower here for more than a week. It is, I believe, the first of the perennial Larkspurs to bloom. Though quite common in thin woodlands it seems to be nowhere abundant. It seldom grows over a foot high, bearing at the summit of its almost naked stem a flat spike of six to ten bluish purple or sometimes white flowers, which are a little more than an inch wide and alternate on either side of the radix of the spike. It bears transplanting well, and when in flower is an attractive plant. The spikes are borne on ample stems for cutting, and should be useful in making bouquets.

The little white-flowered variety of the Blue-eyed Grass (*Sisyrinchium Bermudianum*, var. *albidum?*) is common here in some places. It grows about a foot high, and bears in a cluster near the summit several pretty white flowers, with a yellowish centre, half an inch wide. Its stems are ample for cutting, and it is certainly a plant worth cultivating.

If there is any one plant that seems to thrive here better than the average it is the May Apple or Mandrake (*Podophyl-*

lum peltatum). It can be found in almost any thinly shaded location that is not wet, and makes a very strong and healthy growth. Unlike most plants, it seems to be avoided by cattle and other animals, for it is in the pastures and fallow fields that it thrives best. In pastures, where the cattle had eaten off nearly every green thing, and where hogs had dug over a good portion of the ground around them, I have seen large thrifty patches of this plant untouched.

There are few of our native perennials more attractive in their natural homes than the Spiderwort (*Tradescantia Virginica*), which is quite common here. It is smaller than in cultivation, and, though it is a valuable plant in our gardens, it seems to lack the charm that it has in the woods. Its rich blue petals, golden yellow stamens, and dark green sepals and leaves are a pleasing combination of color. The ten to twenty flowers which are borne on a stem do not open at once, but come in long succession, and prolong the flowering season. *Cynthia Virginica* is also common here, and is just coming into flower. It selects the shade in this region, though when cultivated in New England it seems to prefer the full sunlight.

Botanical Garden, St. Louis, Mo. *F. H. H.*

Succulents for Bedding.

IN certain locations a bed filled with plants of a succulent character may be used with good effect, notwithstanding the stiff and formal habit of growth common to so many plants of this class. But, while of formal appearance, there is yet great variety of form to be had in the various genera usually considered under this heading, and, by a proper admixture of types, a very pleasing result may be attained. Among the plants so used are some of the Euphorbias. *E. Canariensis*, *E. grandidens*, and *E. hystrix* are all odd-looking plants, with leafless, or comparatively leafless, stems that are stiffly branched like some of the Cereus. The first two species are unarmed, while *E. hystrix* is ornamented with long spines. It should be remembered, however, that all of the Euphorbias are more or less poisonous, and consequently some care should be taken to avoid getting any of the sap from these plants into a scratch or sore on the hands.

Almost any of the Cereus also may be used with good effect in the succulent bed. Moderate-sized specimens of *C. giganteus*, *C. flagelliformis*, *C. serpentinus* and others are recommended. The Agaves, of course, should be well represented. The familiar *A. Americana* and its variegated varieties are all desirable plants for this purpose, the latter especially so. *A. filifera* is another good species, and has the advantage of being quite a moderate grower. The leaves are six inches to one foot in length, and from one to one and a half inches in width, gradually tapering to the usual terminal spine; they are dark green in color, the edges being gray and more or less ornamented with gray threads, from which it receives its specific name. *A. schidigera* is another handsome species and of somewhat similar character to the last-named. *A. appalanta* is a striking species, and has rather broad leaves of bluish green color, edged with brown and terminated with a long brown spine. *A. horrida* is a distinct type with numerous bright green leaves with gray borders; both the margins and tips of the leaves are armed with sharp spines. Several varieties of this species have been named and distributed, and, in common with the whole family of Agaves, are well adapted for out-door use in summer.

For filling in and carpeting among the larger plants some small-growing species are necessary, it being essential to the appearance of succulent beds that they be filled moderately close; the slow-growing character of most of these plants is well known, and for this purpose there is nothing superior to the Cotyledons, or Echeverias, as many of them were once known. Of the Cotyledons there are several that deserve special mention, among them being *C. secunda glauca*, *C. Mexicana* and *C. Peacockii*. All of these are small growers and of compact rosulate form, and are therefore among the most useful. For variety, *C. agavoides*, which grows somewhat like a small Agave, and *C. metallica*, with leaves of a peculiar combination of purplish metallic tints, and about six inches in length and also in breadth, may be considered, while for distinct character and pleasing effect *C. orbiculata* is one of the best. The latter is of moderate growth, and has nearly round fleshy leaves that are thickly covered with white farinose powder. *Cotyledon lurida* and *C. Pachyphytum* are also interesting species, the latter being formerly known as *Pachyphytum bracteosum*.

Kleinia repens is an old plant that may also be used effectively in the class of bedding referred to. It has thick fleshy leaves of a bluish green color, covered with a glaucous bloom, and the plant is of dwarf-branching habit. As an edging some of the Houseleeks are useful, the tiny *Sempervivum arœnoideum*, with its web-covered rosettes of leaves, being a pretty variety for this purpose, as is also *S. calcareum* and *S. fimbriatum*.

Holmesburg, Pa. *W. H. Taplin.*

Points of Merit in Asparagus.

THERE has been a good deal of discussion as to whether this vegetable should be blanched or green, and some, claiming that blanched shoots only are really fit to eat, refer for proof to the long, tender and delicious shoots served up in France, where only blanched Asparagus is used. Others say the brown or blanched portion is always tough, woody, and flavorless, and only the green portion should be used; that we must never cut or break below the surface. We think a little consideration of how the plant grows will disclose the cause of this difference of opinion. The young shoots of Asparagus expand and elongate very fast at first, but with decreasing rapidity. The hardening or development of woody fibre commences at the base of the shoot and extends upward, slowly at first, but with gradually increasing rapidity until it overtakes the elongating point about the time it breaks into branches, and the entire shoot becomes hard and inedible.

An Asparagus-shoot, or bud before it becomes a shoot, is woody at the point of juncture with the collar from the first, so that if we cut it at the collar when it is ever so small the lower part will be woody and tough, and we shall have to cut it at a proportionately greater distance from the collar, as the shoot elongates, to avoid this woody portion; so that, if we plant shallow and cut much below the surface, we shall always have woody butts, and to avoid them we cut above ground and have green and tender shoots. If, however, we plant deeply (or better still, follow the French method and plant shallow and thin, during the cutting season banking up over the plants with light, friable soil, or other suitable blanching material) we may have long, perfectly blanched shoots, but far enough from the collar to insure tender blanched asparagus without woody butts. The secret is, cut your shoots at a distance from the roots proportionate to their age.—*Professor W. W. Tracy, before the Michigan Horticultural Society.*

Vegetable Garden Notes.

AMATEUR gardeners often wait for what they call a favorable season to transplant vegetables. After a hard summer rain they hasten to get plants and set them in the muddy soil. This is bad practice, as men of experience know. Plants should not be set immediately after a heavy rain, while the soil is soaking wet, for the packed earth hardens in the sun and bakes into a dry cake about the roots of the plants. If planted just before a rain, they would have taken hold at once. But we cannot select a day before the rain with any certainty. It is safer always to transplant when the soil is moderately dry. Have the plants in a bucket of water, to keep them fresh, make holes large enough to contain the roots without crowding, let an assistant fill the holes with water, put in the plant, then fill the hole with earth, press the soil closely about the roots and cover the surface—that is, mulch the plants with dry earth. In this way the ground will not bake, and the growth of the plants will be unchecked. Tomatoes and Sweet-potatoes particularly need this treatment.

I gathered a beautiful crop of little pickling onions on May 21st. These were sown in February and are now fully ripe, and the ground is free for other crops. Of course, this is earlier than they can be had at the north, but I mention it to note the fact that even at the north a crop of these little Queen Onions can be grown in time to use the ground for late Cabbage, Salsify, Beets or Carrots. Sown at the same time with these the Giant Rocca Onion is still growing, and will probably keep on growing all summer. For family use we prefer the Queen Onion for all purposes. Those grown early will not keep, but we can sow them here in September and let them remain for use all winter where they grow. At the north this Onion will mature a crop if sown early in August.

We are much pleased with the Parker Earle Strawberry from one season's trial. Hoffman is still here the earliest good berry. Cloud is nearly as early, but is small, soft and worthless. Bubach No. 5 lacks productiveness, but is a fine spring sort. Jessie is early, large and good; our market-growers are planting it largely. We have a promising number of seedlings at the station, but, of course, nothing will be done with any of them until tested at other stations.

A Grape called Winchell was sent to us this year with the statement that it is the same Grape that has been sent out as "Green Mountain." We planted it alongside the Green Mountain received last year. So far it differs widely in the appearance of its foliage from the Green Mountain.

Experiment Station, Raleigh, N. C. *W. F. Massey.*

Syringa pubescens, of which a figure was published in these columns (vol. i., page 415), is one of those plants which improve with age. The large plants in the neighborhood of Boston, raised in the Arnold Arboretum from seed sent by Dr. Bretschneider from Pekin, have flowered better this year than ever before, and have proved that this species is one of the most beautiful Lilacs in cultivation. The individual flowers are not large, and the clusters are smaller than those of the other species; they are produced, however, in the greatest profusion, and quite cover the branches. The flowers are at first a delicate rose-color, but, before fading, become almost white; they are deliciously fragrant. *Syringa pubescens*, which must not be confounded with the plant sometimes cultivated in European gardens under that name, but which is really the *Syringa villosa* of Northern China, and probably identical with the Himalayan *S. Emodi*, is perfectly hardy even in our most severe climates, and nurserymen will do well for themselves and for the public by placing it within reach of all planters of hardy, handsome-flowered shrubs.

An Abundant Rust.—The well-known and destructive orange rust of the Blackberry (*Cæoma nitens*, Schw.) is very abundant this season. Specimens have been received at the station from various parts of the state, and during a recent trip through the south it was observed in many places. It is a showy rust, and the fungus not infrequently gave a decided orange color to the infested areas. This rust is one of those that penetrate all portions of the plant and live within the tissues from year to year. When new shoots and leaves form, it quickly spreads from the old parts and shows itself in countless yellow spores, usually in large blotches upon the under side of the leaves. On account of its perennial nature, it is difficult to eradicate this pest by spraying, and the best method is to remove the diseased plants, roots and all, and burn them. As the rust spreads from plant to plant by means of the spores, spraying, if done at the right time, would tend to prevent the spread of the rust.

N. J. Experiment Station. *Byron D. Halsted.*

Correspondence.

Bermuda in May.

To the Editor of Garden and Forest:

Sir,—It is not surprising that the genial climate of Bermuda should attract so many winter visitors from our northern states. A sea-voyage of less than three days, and one which a fast steamer might easily make within forty-eight hours, suffices to bring them to shores that are green the year through, and yet to an air so equable that the fervors of the summer sun are rarely oppressive or enervating, because the heat is so constantly tempered by breezes from the sea. The change in the political and social atmosphere is quite as striking, for the American citizen will suddenly find himself in a loyal English colony where even the negroes—perhaps the most active and intelligent specimens of their race to be found in all the world—speak with a perfect English accent, where fleet or fortress is forever in sight to manifest the imperial power of Britain, and where a large proportion of the men one meets on the street wear the uniform of her army or navy.

The great mass of those who flee to Bermuda to escape the rigors of winter return in April, so that the impressions one receives from a flying visit in late May may be worth recording. The islands are not at their best until June, it is said, and, perhaps, the time is not far away when this will be a favorite haunt for the summer tourist from New York, who could hardly find elsewhere a week or a fortnight of rest and change so perfect and so convenient as that furnished by a trip over cool seas to these breezy islands.

One need not expect any touch of the sublime in the landscapes here, for it would not be possible to crowd many natural objects which inspire awe by their vastness or sublimity within a long and narrow chain of islands containing altogether an area of some twenty square miles. But the land, what there is of it, is pleasantly diversified in surface, rising at one point to an altitude of some 200 feet; and the ever-present sea of itself suffices to insure every wide prospect against the charge of being tame or commonplace. One charm of the sea, by the way, is its marvelous and indescribable color, for the water over these coral reefs outrivals the azure of the sky in the richness and depth of its blue. There are occasional inland views where, in happy valleys, the sea is shut out of sight by encircling hills, and here, at times, one is reminded of New England, with roads winding along Pine-woods with an undergrowth of Ferns. No Pines are here, it is true, but the Bermuda Cedar, at a little distance, constantly suggests the Pine, and on a nearer view it shows so close a relation to our common Red Cedar that there is nothing strange or unfamiliar in its presence, although the species is confined mainly to these islands. When Juan Bermudez, nearly 400 years ago, was feeling his way along the treacherous reefs which surround them, he saw the islands covered with forests of these trees, which then attained to stately proportions. These forests have been cut and re-cut since, and yet they form the most conspicuous growth upon the island to-day; indeed, the larger proportion of the surface seems forest-clad, for wherever the land is left to itself the Cedar "comes in." It would be naturally supposed from the shiploads of onions and potatoes that reach our markets from Bermuda in the spring that every rod of the scanty territory was under plow or spade, but the visitor's first surprise, and one from which he can hardly recover during a brief sojourn, is, that he rarely finds these articles of export growing in large fields—indeed, an acre would pass for a considerable plantation here—but generally in little pockets a rod or so across, where the red soil is deep enough to furnish root-room for the plants, while all about them the rock is thinly covered or thrusts its massive shoulders quite above the ground.

Next to the forests, clothing the hills which slope toward the shore, one who for the first time sails in sight of them through the tortuous channel which leads to Hamilton is struck with the white houses which nestle in their foliage. These are all built of the light friable limestone of the island, which is so soft that it can be readily sawed into blocks. Even the roofs are made of thin stone plates, and the whole building is whitewashed till it glitters. In spite of this shining color the houses have no staring or obtrusive effect, but being substantial and low they only serve to deepen the color of the green about them, making the landscape more cheerful and investing it with a more home-like and human interest.

Once on the land, the roads are among the first objects to invite attention. Very few level acres can be found on the islands, but these old highways adjust themselves most graciously to the contour of the hills and the curving of the shores, winding in and out apparently without purpose or direction. But in so small an area there is little need of railway directness, and one is glad to lose a little time in travel where there is so much of it in a day. At every turn there is a changing prospect, a new arrangement of sea and shore, of cliff and dell, of Lily-fields and Oleander-hedges. Broken pieces of the soft stone spread upon the road-bed at once pack into a smooth surface over which a wheel delights to roll, and its gray tone blends most happily with the prevailing colors of the landscape. And then the fences, which generally are objects whose ugliness needs some excuse, are here a positive ornament. They are walls constructed of the same sawed-stone blocks and cement which are used in all the island architecture, and they would stand for a century here, where there is no frost to heave them, unless they should chance to be crowded over by the roots of some pushing tree. They seem to have been built along the roads generations ago when slave-labor was abundant, standing everywhere square and firm—now as parapets along the brow of some cliff whose base is beaten by the sea, and again as retaining walls against the face of some cutting—usually bare, gray and honeycombed with age, but often draped and garlanded with Maurandya and other vines, or overhung by huge masses of Cactus. They are always picturesque, and, like all solid, hoary and weather-beaten structures, are agreeably suggestive of antiquity. These, then, are the leading features of the landscape which are permanent: a narrow stretch of land, with a rolling and often a rugged surface; bold shores surrounded by a sea of an unspeakable blue; open fields with scant, coarse grass, which leaves them rather brown than green; forests of Cedar with blue-gray foliage; snow-white cottages and a web of roads in a close net-work, uniting with each other at every conceivable curve and angle. Over all hangs a translucent atmosphere which dims the distance, mellows the outline of objects nearer by, and softens away the glare of every intense color. Very beautiful and impressive are the shifting combinations of these simple elements under such a sky.

The efforts of the Bermudians in the past to improve the scenery by planting do not seem to have been as successful as one could wish. So many treasures for gardens in such a climate could be found by searching that one marvels at the scanty catalogue of materials used in the most elaborate places, and yet the gardens are by no means devoid of interest or beauty. Just now the most conspicuous of plants is the Oleander, which grows and spreads with such persistence that many of the islanders count it a nuisance. To a stranger, however, there are few more attractive objects than the great mass which ultimately forms from a single parent stem in rich soil. These are often twenty feet high, with branches arching to the ground in a circle whose diameter more than equals the height—green mounds starred all over with bright flowers which range from pure white through shades of pink to almost crimson in some cases. All that is needed to start an Oleander-hedge is to place a row of cuttings in the ground, and one often sees a broad belt of these plants extending entirely around the boundary of some estate. The Chinese Hibiscus is, perhaps, next to the Oleander in abundance, and it seems equally luxuriant. In many places these plants are sheared into formal hedges, and the great flowers open on the smooth face of this verdurous wall as freely as on the plants which are left to develop into fair-sized trees. *Tecoma Capensis* is another plant which is largely used in hedges, and, just now, it is brilliant with orange-colored flowers, while *T. stans*, one of the most beautiful of yellow flowering shrubs or small trees, is at the height of its bloom. The Tamarisk, here as elsewhere, shows its sturdiness against the salt-laden gales of the sea-coast, and has been planted very largely and with good judgment in exposed places on the shore. The gorgeous blooms of *Poinciana regia* had not yet appeared, but its relative, *P. pulcherrima*, was growing and blooming everywhere. Occasionally fine masses of Bamboo are seen, and these, with the native Palmetto (*Sabal Blackburniana*), the ever-present Banana, and some of the hardier Palms, are the most distinctly tropical features of the scenery, although the Poinsettias, Pomegranates, Bignonias (especially *B. pentaphylla*, known here as the White Cedar), the so-called Sand-plant, *Erythrina speciosa*, with brilliant scarlet flowers on bare branches, and large specimens of the India Rubber-tree wear a strange look to northern eyes. Of course, this is not meant to serve as a complete list of the garden plants of the island, but only to recall those which were sufficiently conspicuous at this season to impress a casual visitor. Space would fail to mention the striking individual plants, like the two fine "Gru-Gru" Palms (*Astrocaryum aureum*) at Mount Langton, but Roses ought not to be omitted, for, although our hardier kinds do not flourish here, those with some blood of the Teas or other tender strains, like Lamarque, for example, were bearing fine flowers in profusion. In the Governor's grounds a superb specimen of *Rosa bracteata* showed that the soil and climate were well adapted to this beautiful species.

How readily some plants will become naturalized when they find favorable conditions is shown by the case of one of the Jessamines (*J. gracile*) which was brought to the islands in 1840. It soon escaped from cultivation, and now it is clambering over the rocks and making an almost impenetrable tangle in the woods of a broken region near the famous Walsingham tract. It is a delightful vine with glossy and fragrant white flowers, and it seems strange that more general use has not been made or it. It would make a charming addition to the landscape if allowed to clamber over the walls along the highways. Occasionally one sees a European Elder, which grows here with great vigor, and is always a beautiful tree. The islanders seem to have caught the European habit of setting it close to the sides of their houses, and it shows to great advantage against their walls. This masking of the house-foundations with shrubbery, however, is no more generally practiced than it is in the United States, but these stone houses would seem to offer excellent opportunities for making such connections with the earth. By one cottage along the road which winds about the north shore stands a pair of Agaves close to the front wall, one on either side of the entrance of a narrow loggia, and the sharp stiff leaves against the white stone produce an effect that no one who drives by them will forget.

All the world knows how extensively the bulbs of the great Easter Lily are cultivated here, and the more beautiful old Ascension Lily, *L. candidum*, flourishes equally well, while Hippeastrums (Amaryllis) and Freesias grow like weeds. At many seasons the fields are brighter than the gardens, but Bermuda is a land of flowers at all times. Our northern states in late May are so attractive that one hesitates about leaving them even for a short absence. But when a few hours can land us amid the vegetation of the tropics, under a new sky and encircled by a strange sea, the change will prove a pleasing one, and the return will bring a keener appreciation of the rare loveliness of our northern spring.

New York. *S.*

Dionæa muscipula as a Window-plant.

To the Editor of GARDEN AND FOREST:

Sir,—One of your correspondents has recently written of the Rattlesnake Plantain as a window-plant, and perhaps some experience with the little Venus' Fly-trap (*Dionæa muscipula*), also as a window-plant, may prove of interest. Early last March five melancholy little plants were given to me by a friend to whom they had been sent from their native haunt near Wilmington, North Carolina. I planted them in a deep pot, which I set in a dish of water in a sunny window. They drooped for a while, but soon became acclimated, and began to send up fresh leaves and long straggling flower-stalks amid a flourishing crop of grass and Chickweed. Beyond giving them plenty of water, little attention has been paid to them, and now my Dionæas are in fine condition, blooming well and exercising their insect-catching propensities to the best of their ability. It was hard to understand how the apparently thin, delicate, little leaves could catch flies nearly as large as themselves, but they certainly do hold them with a murderous grasp. Once I tried to help the plants, and after some trouble caught an unusually large fly, and with a pair of forceps held the tempting morsel between the two valves of a leaf. They very promptly closed on the poor fly, who struggled in vain to escape. Since then my plants have been a daily source of interest, though I let them pursue their insectivorous habits without further help from me. Their leaves are mostly over three inches long, including the curious blade-like stem; the flower-stalks are eight to ten inches tall, and bear at the apex a small cluster of buds and flowers. The latter are about an inch across when fully expanded, the five white petals almost transparent and very delicately veined, and the fifteen fluffy little anthers are light yellow on slender white filaments.

It is a pretty little plant, and certainly a most original and amusing one to watch.

New York City. *Anna Murray Vail.*

Recent Publications.

The New Potato Culture, by Elbert S. Carman. The Rural Publishing Company, New York.

For a dozen years or more Mr. Carman has been making experiments in hybridizing and cultivating potatoes, and in this volume he has collected what he considers the most important results which seem to be demonstrated by his tests. What he claims primarily is, that potatoes should be planted in a trench—say ten inches deep and as many wide. So far as can be gathered from a rather diffuse explanation of the method, the practice advocated is to loosen the bottom of this trench, fill in some five inches of soil, and on this mellow bed to drop the seed-pieces, say a foot apart, and then fill in the remainder of the soil and give level culture. It is claimed that the trenches conserve moisture, which is essential to a good crop. The deep planting also encourages the formation of tubers in two or three planes or tiers, one over the other, so as practically to increase the area of the field by growing one crop above another. The plan also offers some convenience for the application of fertilizers. No doubt, in some soils the trench system would pay well, although it may be questioned whether any revolution in the general method of cultivating the potato is at hand, as the title of this book would seem to indicate.

Many interesting trials with various so-called chemical fertilizers are here recorded—trials made to ascertain the proper proportion of the various elements of plant-food, and the best time and place for their application. All such experiments are indecisive, on account of the small area occupied in the test, the varying conditions of different seasons, and the short time during which they have been conducted. Still they afford valuable hints to the thoughtful cultivator, and they ought to encourage additional experiments on a larger scale in many different soils and climates. Many instructive directions for producing new seedling varieties are given, as well as for the preservation of potatoes during winter, the amount of "seed" to be used, for improving varieties, for mulching, and so on.

The book lacks methodical and systematic arrangement, but a very complete index goes far toward correcting this fault, and Mr. Carman's careful and long-continued studies deserve grateful recognition.

Notes.

It is claimed that Castor-beans grown in California average three times the size of those grown in the east.

The Rhododendrons in the Central Park have never been finer than this year. They were at their best about the 25th of May, when the glen at the north end of the Park was a beautiful sight.

A Washington correspondent writes of the beauty of some fine specimens of *Cladrastis lutea*, or Yellow-wood trees, in the Capitol Park. They have a symmetrical form, with clean bark, smooth twigs and rich green foliage, and are now in full bloom, bearing graceful racemes of snowy pea-shaped blossoms, which have a delicate perfume.

The Horticultural Society at Elizabeth, New Jersey, recently offered a package of China Aster seeds to any girl or boy who would apply for them and agree to grow and enter them for competition at the exhibition to be given in September. Over 500 packages have been distributed. This incident contains a practical suggestion for individuals and societies.

A long-continued blooming season is certainly a great recommendation for any plant used to ornament public parks. None is more remarkable in this respect than the Moss-pink. Early in April its flowers began to unfold in the Central Park; by the 20th of the month they were in full bloom, and on the 25th of May the wide mats they form had not yet wholly lost their rosy color.

A new species of Lilac, discovered in Thibet and western China by Prince Henry of Orleans and his companion, Monsieur Bonvalot, is described by Bureau and Franchet under the name of *Syringa tomentilla*. Its affinities are with *Syringa pubescens*, from which it differs in its longer and narrower leaves, pubescent especially on the lower surface, and by the nearly entire calyx.

The most conspicuous blossoms in the Central Park, after the Forsythias, the Lilacs, the Wistarias, the Judas-trees and the Dogwoods had had their day, were those of the many species of Spiræa which, in every direction, spread their close white clusters. Fortunately the park authorities do not think it needful to "trim" shrubs like these, and the wisdom of leaving them to their own graceful inclinations must have been apparent to every one who noticed how beautifully their long branches drooped toward the grass, uniting the verdure of the ground with that of the shrubberies above.

According to the *Brick, Tile and Potteries Journal* successful experiments have been made at the Technological Institute, in Charlottenburg, Prussia, with regard to the use of sawdust as a building material. Mixed with certain refuse mineral products the sawdust is compressed into excellent bricks, which are very light, are impervious to moisture, and are uninflammable even when brought into direct contact with flame. The same journal says that a French writer recommends the use of sawdust instead of hair for mixing with mortar, the special combination named being two parts of lime, five of sand, one of cement and two of sawdust.

A correspondent writes from Manchester, Massachusetts, for information as to the best methods of protecting apples against various insects. Different remedies are needed for different attacks, but just now it is good general practice to spray the trees with the Bordeaux Mixture, containing in addition Paris Green at the rate of one pound to 200 gallons of the mixture. This will prove useful against the Apple-scab as well as against insects. Bulletin Number 13, just published by the Massachusetts Agricultural College Experiment Station, contains an admirable summary of practical directions for the preparation and use of remedies against insects and fungi injurious to fruit.

A circular recently issued by the Forestry Commission of New Hampshire might well be imitated by similar bodies in other states. It invites the people to give facts and suggestions regarding fires in the forest; to note the places in mountain regions where new roads and paths are needed; to record the effects of denudation on the volume of water in the rivers and streams; to point out views of unusual beauty or natural objects of scientific or picturesque interest, access to which has not yet been rendered easy; and to report upon the value of timber-lands as investments, as well as upon any new or unusual uses to which timber or other forest-products are being put by manufacturers. If the people of the state generally respond to these invitations, a mass of very interesting and ultimately beneficial information will unquestionably be collected.

In his "Common-Place Book" Southey quotes from Pierre Huet, a French critic of the seventeenth century, a passage which proves that the garden roller was not then, out of England at least, a familiar implement. Writing of the garden of Lord Paulet, at Hinton, St. George's, Huet says: "It is very different from the common style of English gardens. These are usually walks of sand, made perfectly level by rolling them with a stone cylinder, through the axis of which a lever of iron is passed whose ends, being brought forward and united together in form of a triangle, serve to move it backwards or forwards, and between the walks are smooth grass-plots, covered with the greenest turf, without any other ornament." The garden of Lord Paulet, we are then told, "is a meadow divided into several compartments of brick-work which are filled with flowers."

A writer in the *Sun*, of this city, recently remarked, that in spite of the attitude taken by certain prominent men toward the multiplication of railroads in the Adirondacks, "the feeling against them is intense and almost warlike in the hearts of thousands who have seen the woods before and since railroad building began there. 'In 1884,' said one New Yorker, 'I entered the woods below Malone, and fished and hunted through a great reach of as absolutely wild forest as I ever saw. Fish and deer were plenty, and wild nature was luxuriant. Three years later I went there again. The whole area where I had hunted before was waste and bare—all burned over and desolate. A great sand desert was one feature of the country, and the rest was a litter of blackened stumps. Miles of the forest had been irrevocably destroyed, for not even time can replace the original woods. That was what followed the building of one little railroad in the Adirondacks.'"

No single plant does more to ornament the Central Park than the Wistaria. On the many arbors and shelters over which it is trained its spring display of blossoms is enchanting, while after these have fallen its thick, yet graceful, foliage forms an impenetrable canopy of shade without producing too heavy an effect. But if less useful, it is perhaps still more beautiful where it has been planted close to isolated trees and allowed to twine itself among their branches. When the tree is a conifer the contrast of its stiff and dusky green with the paler green and the lilac blossoms of the creeper is perhaps a little too pronounced. But on deciduous trees the Wistaria often combines with its support in a manner as harmonious as it is striking. A most beautiful instance of such a combination could be observed a week or two ago on the East Drive, near the Seventy-second Street entrance, where a Linden of moderate size and symmetrical growth was completely covered with Wistaria, yet so loosely draped that its development had not been hindered and the character of its own leafage could still be seen. From its lowest branches to its topmost twigs it was thickly hung with the fragrant lilac clusters, so that it wore the aspect of a gigantic bouquet composed of flowers and of two kinds of foliage; and this aspect it preserved for many consecutive days. In another part of the park the same plant displayed itself in a different, but almost equally charming, way. Here an arbor runs at right angles to the drive, opening directly upon it between closely flanking trees and shrubs. The Wistaria that had been planted to cover this arbor had spread over the trees as well, so that one saw an archway, apparently composed entirely of flowers, supported by masses of green, over which the blossoms were more loosely spread.

Catalogues Received.

Dr. L. P. Britt, 37 College Place, New York, N. Y.; Britt's Automatic Safety Bit.—Wilfred A. Brotherton, Rochester, Mich.; Catalogue of Michigan Wild Flowers for Parks, Gardens, Bogs, etc. List of Plants for Carp Ponds. Also, Wholesale Trade List of Michigan Wild Flowers, Trees, Shrubs and Ferns.—Dammann & Co., San Giovanni a Teduccio, near Naples, Italy; Wholesale Catalogue of Bulbs, Roots and Orchids.—F. W. Devoe & Co., cor. Fulton and William Sts., New York, N. Y.; Catalogue of Artists' Materials.—Wm. Baylor Hartland, 24 Patrick St., Cork, Ireland; Daffodils for the Trade.—L'Horticulture Internationale, Brussels, Belgium; New Orchids, Established Exotic Orchids, Nepenthes, Ornamental Plants for Conservatories and Winter Gardens, Palms, etc.—A. W. Livingson's Sons, Columbus, Ohio; Vegetable and Flower Seeds.—Pitcher & Manda, The United States Nurseries, Short Hills, N. J.; Descriptive Catalogue of New and Rare Plants. Also Price List of Hardy Perennials, including Alpines, Aquatics, Orchids, Ferns and Small Shrubs.

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Railroads in the Adirondacks.

THE failure of the last Legislature of this state to provide for a forest-reservation in the Adirondack region has been followed by an energetic effort on the part of several railroads to build lines across the entire region. The sudden interest which has been aroused in the question of forest-preservation by the efforts of these railway companies to secure the right of way across the lands which now belong to the state is somewhat surprising, in view of the fact that so little effective work has been done hitherto toward protecting these woods from other encroachments of this sort. If the proposal to set aside a portion of these elevated forest-lands for public use had been a novel one and there had been no time to arouse popular interest in the necessity of such a step, we might infer that the great organs of public opinion in the state had just awakened to the fact that there was such a forest and that it was in danger. But the truth is, that it is now twenty years ago since a commission was appointed, with the Hon. Horatio Seymour at its head, who were directed to "inquire into the expediency of providing for vesting in the state the title to the timbered region lying within seven counties designated, and converting the same into a public park." Even then it was reported by these commissioners that the land of this vast region, once owned by the state, had been largely conveyed away to purchasers who had bought it for timber and bark, excepting a tract of a quarter of a million of acres which had been transferred at the price of five cents an acre to the Sacketts Harbor and Saratoga Railroad Company. It was stated, too, that the small fraction of the territory still held by the commonwealth was in detached parcels, amounting in all to less than 40,000 acres.

At that early day much of the land had been stripped of its timber and had been abandoned by the owners after this had been removed, because it was not worth to them even the taxes due on wild land. In this way great tracts were sold for arrears in taxes and left in the possession of the state as not worth these claims until the lands lying under such condemnation had again been covered with timber enough to make them desirable when they were again bought from the state, to be again abandoned when stripped of everything valuable upon them. Of course this process has been continued ever since. The magnificent Hemlock forest has fallen before the demands of the tanneries along the eastern, southern and western borders of the wilderness, and the timber, after the bark was stripped from it, has been left to perish. Where the lumber has been cut away the remaining wood has been consumed in charcoal kilns or worked up into paper pulp or destroyed by fire.

Railroads have already done their share toward helping on this desolation. The forests along parts of the Chateauguay Railroad have been transformed into a literal waste. The destruction has been absolute and utter; the very stumps have been burned out, together with the humus which had accumulated from a forest-deposit of thousands of years, until no green thing has escaped, and there is no hope of future growth to cover the scorched ground and fire-cracked rocks. Not only does such a road furnish an opportunity for the speedy carrying away of all marketable lumber, but it makes profitable the conversion of all the remaining wood into charcoal, so that every particle of verdure within reach is obliterated. This is a universal law, for what is true of the desolation along this Chateauguay road is true, and worse, if possible, along the other railroads which have penetrated the forest. All this ruin has been going on for years, and the people of the state have taken no effective measures to arrest it. Perhaps the present torrent of discussion means that all the work which the friends of the woods have been doing for years in the way of protesting and educating the people to an appreciation of their value has at last begun to bear fruit, and if so, this must be counted one of the few encouraging signs of progress toward a proper treatment of our natural resources.

It is true that the Reservation Act passed some years ago gave fair promise of greater security to the woods, but, somehow, the commission appointed under it failed to inspire the public with confidence, and although it is claimed that they have done much to prevent trespassing on the state land, the people's park seems as far away from accomplishment as it was when they were appointed. The last activity of the commission, however, has borne some fruit. They have taken steps to prevent a railroad from crossing the lands already in possession of the state, and in the conflict which has followed the Attorney-General has given an opinion which, if sustained, will prevent the building of any line over the state lands in the Adirondacks without special legislative enactment. If this opinion is sound law, it follows that the other railroads which are now built on state lands must be driven out as trespassers. Even this, however, may not prevent the consummation of the most ambitious of these new schemes, for it is asserted that a railroad can be built across the forest for its entire width and keep on private property all the way.

Of course, the success of this plan would be a public calamity. We are aware that the projector of this road is himself a large forest-owner, and we have no reason to question the sincerity of his intention to hold this vast property in forest forever. But, even if it is admitted that this would be possible during his life-time, it must not be forgotten that the permanent preservation of a forest can never be assured until it is under the control of an undying owner. All experience has proved that forests are never safe so long as they are held by private owners. The time must soon come in their history when they are transferred to alien hands and when it will become the absolute duty of some one who has them in charge to realize the greatest immediate

money return which it is possible for them to yield. The forest, then, is doomed to fall; and when that crisis comes to this particular forest, the railroad which pierces it through will make its destruction easy, certain and complete. There is no permanent safety for the Adirondacks until it is owned in fee-simple by the state, and even then it will never be free from attack until the people of the state have been educated to realize its paramount public value.

Of course we appreciate the truth that there should be a steady income from a permanent forest; that such a utilization of its products will not depreciate the value of the forest as a reservation; that, indeed, the forest will be safer for yielding an income, and that to yield an income there must be facilities for removing timber. But it is quite possible to accomplish this by a system of narrow-gauge gravity roads through the tract, together with timber slides and such other appliances as lumbermen of the present day are familiar with. Even if one or more first-class railways through the woods would make such transportation easier and cheaper, their simple presence would destroy the essential value of the Adirondacks as a resort for rest and recreation. The fundamental charm of this region is its remoteness from the great lines of travel and disturbing human activities. If the woods were crossed and recrossed with railroads, settlements would spring up at their intersection, the deer would be frightened from their ranges, the fish in the streams and lakes would be caught for city markets, and the wildness would be chased away with the game. The place would still have attractions, but it would no longer be a wilderness. It would be a commonplace collection of mountains and woods and lakes, with the ordinary conditions of work-day life forever in sight. The strangeness and romance would all vanish, and with them the temptation to tent-life in the presence of untamed nature. It will be hard enough, even under the most favorable auspices, to save the woods with all their suggestions of remoteness and separation from the ordinary conditions of life, but it will be absolutely impossible to do so if railroads are allowed to penetrate them.

A Fountain at Potsdam.

THE picture on page 271 shows part of the façade of one of the minor palaces at Potsdam, near Berlin, and the fountain which its windows overlook. The composition is a charming one in the rather severe classic style which was in favor toward the end of the last century. Although at first sight it may seem odd that the basin of the fountain has a balustrade on one side only, a good reason for this can easily be divined. A balustrade was needed on the side next the house to connect the fountain with the steps, and, by means of these, with the main architectural motive, and to give it dignity when seen from the house. But had it been continued on the further side it would have formed a sharp line against the vegetation beyond, whereas now the eye must pass to this without hindrance, and the little sheet of water must seem to blend naturally with its surroundings. Animals spurting water from their mouths are not often agreeable objects, and we may possibly wish that these lions might be replaced by figures of another sort. Still, they have a stately air, befitting the character of the architectural scheme as a whole, and their descending lines of water contrast well with the great ascending shaft in the centre. The alternating figures and urns on the balustrades are entirely happy features, and, of course, the little pavilions are admirably designed to repeat and support the "motive" of the palace front.

But we wish particularly to call attention to the way in which the whole composition gains by the presence of the thick masses of foliage. As we look from the point where the photograph was taken they form a delightful background for the fountain, and at the same time frame the palace, concealing its extent, and thus giving the imagination a chance to act. And in the view of the fountain from the palace they must be equally effective, revealing more or less of it as the spectator changes his standpoint, be it ever so slightly. If we fancy these masses of foliage pushed back so as to reveal the whole façade and to give a free sight of the whole fountain from its windows, how greatly the scene loses in both dignity and poetry! Nor would it be so beautiful were the shrubberies less dense, allowing the eye to pass between the trunks of the trees. Just this mass of vegetation, solid below and more broken and graceful above, was needed to give its full effect to the architectural group.

California Plants for California Gardens.

SOME time or other the thought that the proper plants to grow in any given place are those native to it, may perhaps spread until it finally reaches popular acceptances. Heretofore it has been the custom in most places to fill the garden with exotics—in fact, anything not indigenous to the locality has always been considered the correct thing to give space to and to grow, if possible. The more care and labor required to make such plants succeed, the nearer right has been thought the choice made. But this is a mistake. The proper plants for California gardens are California plants. Have we any lack of attractive things? Look at the foot-hills! Behold the sandy fields by the seaside and the sheets of gold, of pale yellow and blues and most lovely harmonious grays that cover them over. Is anything more brilliant ever seen in gayest garden or park-border elsewhere?

What we need to do is simply to bring together the splendid collection nature offers us, and that is now so widely scattered over the state. These things she has planted where they are likeliest to succeed, in stony and sandy soils upon which the grasses and civilized weeds that love rank feed are not disposed to intrude and choke them out. We cannot bring these all into one garden, but we may into any one town or county.

Each garden could show a different group. The annuals I would place in the wide, depressed gutters at street-sides, but the bulbous plants and more striking perennials in the borders against and around the house. The shade-lovers, that is to say, the Violets, Trilliums, the Actæa, the Thalictrum, the Anemone, the Trientalis, and all such modest things in size and dress, not to forget the Ferns, would find room out of the sun's way on the house's north side.

If need be, the town trustees could furnish the seed for the gutter plantation, and the town marshal could vary his usual round of duties by filling a gardener's place for a while.

The true California flower season lasts from March to mid-June, inclusive, though afterward here and there a bright spot lingers where some perennial, possessed of deep-feeding roots and a longer or later flowering period, has established itself. These are candidates for the garden I have in mind as its fixed features.

The practice of irrigating garden-ground in summer should be abandoned, because unhealthy, as all confess it to be. Our new scheme for the garden makes this shelving of the hose not only a possibility but a desirability, as the plants we are about to adopt know only a continuous dry summer, and, furthermore, have learned by long practice where to find all the water they need.

It is to be hoped Senator Stanford will bring together, within the ample grounds of the University at Palo Alto, the entire flora of California, so that we may all see just what may be done in the way of furnishing well a series of gardens with native plants only.

[These notes are taken from an article in the *Pacific Rural Press*, and we reproduce them because they present a truth of more than local application. Of course we would not confine the selection of garden-plants in a given region entirely to those that are native there, but the first qualification of a beautiful plant is health and vigor, and when native plants are selected, we are sure, to begin with, that they are adapted to the climate. No one will exclude exotic plants that will thrive, and our own gardens in the spring would sadly miss the Snowdrops, Tulips and Daffodils, the Peonies, Irises and Poppies, which have come to us from distant countries. Nevertheless, it is true that American plants are too rarely seen in American gardens. This is not only true of our shrubs and small trees, which are among the most beautiful to be found in the world, but it is true of herbaceous plants, which can be procured in almost endless variety. It may be added, for the benefit of those who are anxious to decorate their gardens with plants that are rare, that our own Trilliums, Uvularias, Sanguinarias, Erythroniums and many others would be much more strange to the eyes of the ordinary visitor than the exotic garden-plants, which everybody cultivates.—Ed.]

Recent Botanical Discoveries in China and Eastern Burma.—VII.

Davidia.—I have previously said something about this remarkable tree, but as we have since received at Kew abundant specimens of it collected by Dr. A. Henry, with further information respecting the tree and its home in the west of China, it may not be thought superfluous to devote another paragraph to it, especially as it would probably prove hardy in the northern United States and in the United Kingdom—at all events, in the wilder parts. Like the Chinese Tulip-tree, it would seem to have become exceedingly rare, for Dr. Henry met with only one specimen of it during his long journeyings in Hupeh and Szechuen. As already related, the Abbé David first discovered it, now some twenty-one years ago, in the district of Moupine, eastern Chinese Tibet. This locality is about seven days' march west of Chingtu, the capital of Szechuen, and David spent nine months there, with most valuable results to science. The principal mountain range rises to an altitude exceeding 16,000 feet, and David succeeded in scaling the summit. He was located at an altitude of about 7,000 feet, and to reach this place had to cross a ridge about 10,000 feet high. The main ridge he found beautifully wooded up to 11,500 feet, with charming flowery meadows above, and no permanent snow. Davidia grew on the skirt of the forest, at an elevation of 6,500 feet, associated with a large Cerasus, bearing small red fruit, with a gigantic Corylus, with a corky barked Quercus, and with various Laurels and Figs. Judging from this description of the vegetation one would not expect it to be hardy except in the most climatically favored parts of the United Kingdom; but Dr. Henry, who is at present in England, is of opinion that it is hardy enough to flourish generally in our climate. Henry found it near south Wushan at about the same elevation that it grows in Tibet, and I am indebted to his kindness for the following particulars of his rediscovery of this remarkable tree:

"As one ascends the Yangtze, in that part of its course known as the 'rapids and gorges,' one comes to the little village of Psishih, which lies on the right bank, and marks the political division of the Szechuen and Hupeh provinces. Southward from the river the boundary line is a tremendously deep ravine, through which rushes a stream to join the Yangtze. One cannot get up this ravine, so narrow it is, and so full of cataracts, with wonderfully grand walls of almost perpendicular rock rising on either side to a height of 3,000 or 4,000 feet! While on my botanical trip of 1888 I staid for some days close to the head of the deep part of the ravine, inland a few miles from the river, in the cottage of an old Roman Catholic lady, named Mrs. Huang. There the ravine widens into a valley, skirted by a high and precipitous mountain range on the eastern side, on the western side by an extended flattish country. A few miles higher the western mountain range curves round to the east, and in this curve, some three or four miles in area, where the streamlet rises, is a bit of 'old wood,' as the Chinese term it, or 'virgin forest,' as we should call it, walled in on three sides by cliffs. Near the forest, in the midst of a few trees which evidently formed part of the 'old wood' before the farmer had encroached, we came, on May 8th, in view of a striking tree, all green and white in alternate patches, like some curious arrangement in checks. This was a specimen of the *Davidia involucrata*, the only one I or my coolies saw during a six months' trip over hundreds of miles of wild country. The tree was, on this day, in full bloom, and was between twenty and thirty feet high. We were immediately told two or three names for it by local natives, but nobody really seemed to know anything about it, except that it was very rare, growing all alone, without a rival, in what had been a part of the ancient forest."

Later in the season, Dr. Henry sent his coolies into the same country again and they obtained fruit, but, unfortunately, not perfect seed. I believe seed was sent to France by the Abbé David, for the late Professor Decaisne, writing to Sir Joseph Hooker in 1871, said, "I have been informed that the Davidia is in cultivation in the nursery of André Leroy, at Angers." However that may have been, I can find no record of its having been raised. That it, of itself, is almost worth a journey to its home the figures we have of it bear sufficient testimony. The foliage and young wood, in the absence of flowers or fruit, would pass for a Lime; but when in flower, as stated by Dr. Henry, the tree must present a very striking appearance. The two large bracts enclosing each bead of flowers are pure white, and the numerous anthers are red. Each inflorescence or head of flowers consists of a large number of stamens seated on a club-shaped receptacle, without any trace of calyx or corolla, and usually one female or hermaphrodite flower obliquely situated in the midst of the stamens. Sometimes this flower has five imperfect stamens springing from the neck of the pistil and alternating with as many minute calyx-lobes; sometimes the stamens are wholly wanting; sometimes the inflorescence contains no female flower. The fruit or seed-vessel is woody and contains three or more cells with a solitary seed.

The botanical affinity of Davidia is with Nyssa (Tupelo, Pepperidge or Sour Gum trees of North America), though it has nothing in common in its general aspect. Singular to say, Dr. Henry also discovered a species of Nyssa, which has been named *N. Sinensis*—the genus, however, previously known to be represented in India as well as in North America. A new genus of the same affinity—*Camptotheca acuminata*, discovered by the Abbé David at Kinkiang, was collected by Dr. Henry in Hupeh; and yet another new member of this somewhat anomalous group of trees was discovered by Dr. Henry in Szechuen, namely, *Toricellia angulata*, figured in Hooker's "Icones Plantarum" (plate 1893). Interesting as these trees are, botanically, not one approaches Davidia in ornamental character. The last Toricellia may be deserving of notice. It is a tree fifty feet high, with sharply lobed leaves in the way of a plane, and pendent inflorescence of inconspicuous flowers.

Kew. *W. Botting Hemsley.*

How We Renewed an Old Place.

VIII.—AN ANCIENT ORCHARD.

THE whole farm at Overlea might well come under this head, for it abounds in Apple and Pear-trees, which are scattered about it, from the point at the north to the foot of the hill on the south.

Tall, fuzzy old settlers they are, with mossy trunks and gaunt branches; but, like the ancient New England human stock, they die game, and are useful to the end. The weather-beaten old Seckels, which look perfectly hopeless, still produce stout, brown, rosy little pears, as sweet as honey, if not much bigger than an overgrown bumble-bee, and the venerable Bartletts, which we threaten every year to cut down because they look so shabby and disreputable in their torn and mossy old jackets, put off the evil day by mollifying us every September with a crop, which, though not large, still serves to purchase them a reprieve.

One of the conspicuous ornaments of the level space below the northern terrace of the house is an old Pear-tree we call Methusaleh, which was transplanted in 1779, and, in spite of its great age, still bears a profusion of hard, sweet pears, which the housewives consider excellent for coddling or preserving with barberries.

This ancient and honorable old continental, which stands some fifty feet in its stockings, girths ten feet and three inches a foot from the ground, and has a coat so beautifully wrinkled and seamed with age that our artist friend tells us a Japanese would beg a bit of the bark for a curio, and exhibit it as a precious and artistic possession.

In the spring its venerable poll is snowy with blossoms, and though its great trunk is quite hollow within, the six huge branches into which it separates near the base, spread wide and strong, and send out from their broken tops vigorous young shoots, on which the fruit grows profusely.

We suppose this to be the original well-known Cushing Pear-tree, as this farm was a part of the colonial grant to Matthew Cushing in 1634, and was the Stammhaus of that widespread race, which held the property in the Cushing name for 243 years, the land having descended by will from one to another, so that we hold the first deed and paid the first money that was ever given for it.

The Apple-orchard proper, which is in the shape of a flat-iron, lies in the point of the place, which is quite filled by three or four enormous old trees, which have grown to a great height, and had, when we came, immense branches that arched over and almost swept the ground, their huge mounds of rosy bloom in spring making a wondrous sight.

Since then, with a vague idea of improving them, though some of the wise ones tell us it is a mistake to meddle with such old trees, we have had them pruned, that the sun might shine more directly upon the apples, which failed to color properly in the dense shade. Also, the ground beneath them has been plowed, to the great detriment of their small roots, which, owing to the marshy ground below, lie very near the surface.

Last year was not their bearing year, and not until this autumn can we tell the results of this surgery. The plowing

was not done so much for the trees as for the grass, which had been fairly driven out by the encroachments of the Money-wort, which has escaped from the garden and runs riot over the place; and the pruning was as necessary for the hay-crop as for the fruit, for the great Elm hard by helps to shade all that part of the grounds, and even now the grass, when cut, has to be transported into the open to be cured.

The year we took possession, three trees at this point—a Baldwin, a Rhode Island Greening and a Russet—furnished us with about a dozen barrels of apples. In addition, there are in other parts of the place more old-fashioned trees, like the Seek-no-Further and Early Sweet, that are extremely useful and fairly productive in spite of their years and infirmities. One of the latter trees is quite a curiosity, for half of it is wholly denuded of bark, as if it had been struck by lightning, and the trunk is perfectly hollow, but the grafted stem still sends out very strong and healthy-looking shoots that yield an abundance of fine rosy-cheeked fruit every other year.

The Canker-worm has meddled very little with these trees, but the Web-caterpillar has to be waged constant war upon, both in spring and fall, and last summer, owing to the preceding mild winter, this pest was particularly active and ubiquitous.

A row of Plum-trees against the east foundation-wall of the old house, which still stands and makes a good shelter for our Raspberry-bushes, seem as if they would do well if we could only cope successfully with the murderous black knot, with which we found them perfectly covered. In 1889 all the diseased portions were cut away, and last summer they sent out a quantity of tall, healthy branches, but no blossoms, from their closely polled stems; we purpose this spring to try the effect of salt bags in the crotches of the limbs, which, we have been told, is a successful way of keeping off the Curculio. But from what we read of the necessary efforts to get rid of this pest, we fear that the plums would hardly be worth the trouble, for it seems as if nothing less than a Salvation Army would suffice to combat this persistent beetle sinner.

In our orchard are Iron Pears of the good old kind that would serve for ammunition in a field-piece, in case of war, and some rickety-looking Lawrences, that bear excellent fruit in generous quantities; and there is a picturesque Crab-apple-tree which grows quite too near the great Elm to furnish any decent fruit, though it does its best, and strews the ground beneath it with its stony red and yellow fruit. The old Cherry-trees were too worthless, so we cut them down. Peaches we have none, though we are told they would thrive against the hill, as they like a northern exposure. We are now preparing to plant a fresh Apple-orchard, which ought to be ready to bear by the time the old trees quite give out, and we should be grateful for suggestions as to the best kinds for domestic uses, and whether the trees will be more likely to thrive in the moist or in the dry part of the grounds.

But there is a charm about this unproductive old orchard, with its wilderness of venerable shrubs along the fence, that no thrifty modern row of fruitful trees will ever possess. As one sits there in the shade on a sunny day, with the white petals drifting down from their lofty summits, there is a murmur of bees among the foliage, of robins chattering among the twigs, a rustle of leaves and flowers in the gentle breeze, that seems the essence of the many summers gone that have helped to swell their great boles, and to increase their majestic height. From under the arch of branches the green meadow is visible, with wooded hills rising from its margin, among which nestle cottages, white and red, with the faint smoke curling lazily from their chimneys up to the blue sky, flecked with round white clouds. How many years the old trees have looked out upon the quiet meadow, and for how many generations have they dropped their rosy fruit!

In this new country of ours we yearn for stability, for tradition, for something to link us with that past which goes back so little way behind us here. Perhaps the grafts on these old limbs were brought from England by the early settlers who peopled the old colony. Under their shade the sturdy Puritan has leaned upon his spade and remembered the orchards of his native land, which he was never to see again; and now, as the vision grows before our dreaming eyes, we climb the ladder of the past, and are again in Lincolnshire, and the choir-boys are chanting softly in the distance, and the bells are ringing from St. Andrew's Church, of the other Hingham, the gray towers of which we see afar off, instead of the quaint spire of our old meeting-house, whose ten-score years of life seem so little in the older world, where they reckon time by centuries instead of decades.

But the boom of the bells resolves itself once more into the humming of bees, the venerable towers are but the shaggy trunks around us, and we are awake once more, under the bending boughs of the old orchard, with only a robin for a chorister.

Hingham, Mass. *M. C. Robbins.*

New or Little Known Plants.

Alnus maritima.

THIS very rare tree, which is still little known in gardens, differs from other Alders in that its flowers are produced in the autumn. Alders usually flower very early in the spring, either some time before the leaves appear, or with or just after their appearance. *Alnus maritima*, however, flowers in August and September, the flowers being produced on shoots formed during the previous spring. The female catkins do not enlarge very much after fertilization until the spring, and do not mature until the following September or until the flowering period comes round again. On this tree, therefore, flowers and ripe fruit appear simultaneously. This fact, which is the most remarkable thing about this tree, was entirely overlooked in the last monographs of the Alders published in Europe, although it has been known here for a hundred years, or ever since the Seaside Alder was first noticed.

Alnus maritima (see page 269) is a slender glabrous tree, rising occasionally to the height of twenty-five or thirty feet, with a trunk sometimes three or four inches in diameter covered with smooth pale brown bark, stout obtuse glabrous winter-buds, and glabrous zigzag branchlets marked with small white lenticels. The leaves are oblong or obovate, two and a half to three inches long, acuminate or rounded at the apex, wedge-shaped at the base, sharply and remotely glandular-serrate; they are borne on slender petioles an inch or an inch and a half long, and are bright green above and rusty brown on the lower surface. The stipules are thick, oblong-pointed, an eighth of an inch long, dark reddish brown and early deciduous. The fertile catkins are usually solitary from the axils of upper leaves; they are an eighth of an inch long, and are borne on stout stems three or four times their length; at maturity they are obtuse, an inch long, half an inch broad, and dark brown or nearly black, with thickened conspicuously lobed scales and wingless fruit. The sterile catkins, which are usually racemose-clustered, are long-stalked and vary from an inch and a half to more than two inches in length; they are developed from the axils of the upper leaves and droop gracefully from the ends of the branches.

*Alnus maritima** was known to Humphrey Marshall, who described in the "Arbustum Americanum" its peculiarity of flowering in the autumn. Muehlenberg and Charles Pickering, the distinguished naturalist of the Wilkes' Exploring Expedition, were familiar with it, and, in later days, Mr. William M. Canby found it in a number of places on the coast of the lower peninsula of Delaware and of Maryland, where it grows on the edges of streams, although not directly on the sea-shore as its name would seem to imply. This Alder abounds on the banks of the Nanticoke River at Seaford, Maryland, near the high-tide mark and lower down. Here it mingles with the common southern Alder (*Alnus serrulata*), the Sour Gum, the Taxodium, the Red Maple, the White Cedar, and other swamp and muddy-shore trees. Mr. Canby found it also growing plentifully along the shore of Wicomico River at Salisbury in Maryland, both above and below tide-water, and along mill-ponds and head-water streams in the same locality. What appears to be the same plant was collected by Hall on the banks of the Red River in the Indian territory. Of the western tree and of its distribution, however, more infor-

* *Alnus maritima*, Muehlenberg; Nuttall, "Sylva," i., 14, t. 10.—Gray, "Hall's Pl. Texas," 21.—Canby, *Bot. Gazette*, vi., 270.—Sargent, "Forest Trees N. Am., 10th Census, U. S.," ix., 162.—Watson & Coulter, "Gray's Man.," Ed. 6, 373.

Betula Alnus maritima, Marshall, "Arbust. Am.," 20

mation than now exists is needed. It occurs in closely related forms in Japan * and in Manchuria.†

Alnus maritima was introduced into cultivation by Mr. Thomas Meehan, who, in 1878, sent it to the Arnold Arboretum. Here it makes a small shrubby tree now six or eight feet high. It is usually hardy, although in the winter of 1885 the plants in the Arboretum were killed down to the ground. As a garden-plant this Alder has considerable beauty, especially in the autumn when it is covered with its large, bright, golden-colored catkins of male flowers which hang from the ends of the slender branches.

C. S. S.

Fig. 47.—Alnus maritima.—See page 268.

* *Alnus maritima*, var. *Japonica*, Regel; De Candolle, "Prod.," xvi., ii., 186. *Betula Alnus*, Thunberg, "Fl. Jap.," 76.
A. Harinoki, Siebold, "Syn. Vehr. Gen.," 25.—Miquel, "Prol. Fl. Jap.," 69, 358.
A. Japonica, Siebold & Zuccarini, *Sitz Akad. Münch.*, iv., 230.—Regel, "Mon. Bet.," 85, t. 15, f. 22–27.

† *Alnus maritima*, var. *arguta*, Regel, l. c.

New Orchids.

Cypripedium × Dauthieri, var. Poggio Gherardo, Ross, is a very pale form of *Cypripedium Dauthieri*, in which the purple-brown of the upper sepal is confined to its lower half, the upper part being green with a white border; the petals and lip are also paler than usual. It appeared in the collection of Signor H. G. Ross, of Florence, Italy.—*Gardeners' Chronicle*, April 4th, p. 426.

Cycnoches Rossianum, Rolfe.—This is a very interesting species of this sportive genus, which has flowered in the collection of Signor H. G. Ross, of Florence, on several occasions. In 1889 male and female flowers were produced on either side of the same pseudo-bulb, though on other occasions the males only appeared. The male racemes are pendulous, long and slender, with somewhat distant flowers, which are heavily barred with reddish brown, on a yellowish green ground. The female flower was erect and solitary, much larger and wholly green. It was purchased as *C. Warscewiczii*, which, however, is quite distinct, having very much denser male racemes of wholly green flowers. This makes, at least, the fifth species of which both sexes are known.—*Gardeners' Chronicle*, April 11th, p. 456.

Masdevallia Rolfeana, Kranzlin, is a pretty species, said to be allied to *M. velifera*, Rchb. f., which flowered in the collection of Messrs. F. Sander & Co., of St. Albans, during last July. The flowers are of a rich chocolate-brown, except the base of the tube, which is honey-colored; their length is two and a half inches, of which more than half belongs to the tails. Its native country is not recorded.—*Gardeners' Chronicle*, April 18th, p. 488.

Odontoglossum × dellense, O'Brien, is a pretty form of *O.* × *excellens*, in which the sepals and petals are more spotted than usual. It appeared in the collection of Baron Schröder, of The Dell, Egham. The variability of *O.* × *excellens* is now very well known. *O. Pescatorei* and *O. prænitens* are given as the supposed parents of the present plant, but after comparing an authentic flower with *Botanical Magazine*, t. 6229, I am quite satisfied that *O. triumphans*, and not *O. prænitens*, is the other parent. The lip of the last-named rare species is quite distinct in character.— *Gardeners' Chronicle*, April 25th, p. 521.

Masdevallia macrochila, Regel.—This is figured and described as a new species, allied to *M. bella*, Rchb., f. It appears to me identical with *M. Chestertoni*, Rchb., f., a species discovered by Chesterton in New Granada, and imported by Messrs. F. Sander & Co., of St. Albans. The present plant has the perianth somewhat less spotted than the form figured in the *Botanical Magazine*, t. 6977, but the species is variable in this respect.— *Gartenflora*, xl., p. 170, t. 1344, figs. 4 and 5.

Stanhopea graveolens, var. Lietzei, Regel, is a pale yellow form of this somewhat variable species, with the front lobe of the lip densely spotted with reddish brown, and a narrow orange band round the hypochile. It is said to have been imported from Brazil.— *Gartenflora*, xl., p. 201, t. 1345.

Kew. *R. A. Rolfe.*

Foreign Correspondence.

London Letter.

English horticulture has risen to the dignity of possessing a "Worshipful Company of Gardeners," a kind of City Guild which has been "resurrected" in the hope that it may be able to afford some assistance to gardening in this country. It has begun to do something by proposing "to make provision for the due and proper teaching of the technique of the craft, and to examine and issue certificates of efficiency to the craftsmen." How this is to be done has not been divulged. The "technique of the craft" can only be taught by actual experience in good gardens. There is no sure and certain road to success in horticulture through the lecture-room, and examinations, as generally conducted, often place the theorist and mere paper man in front of the practical and genuine gardener. A man must begin at the potting bench and wheelbarrow and work right through the whole if he wants to have a real grip of the technique of good horticulture.

Cape Bulbs.—A lecture on these plants was recently given at a meeting of the Royal Horticultural Society by Mr. James O'Brien, whose knowledge of and skill in growing them is exceptional. The lecture was devoted chiefly to cultural matters, such as temperatures, resting seasons, soils and water. Many cultivators are apt to overdo the more delicate Cape Bulbs in the matter of water and temperature. It is true that in England the climate is not such as to render the cultivation of Cape plants an easy matter, but there are, nevertheless, means by which it is possible to grow most of them. In America, no doubt, you would do Cape plants better and easier than we do, as you have more sunlight in winter and hotter summers than we have here. Cape Crinums, Hæmanthus, Nerines, Cyrtanthus and many similar plants would be splendid garden-plants in lands where there is plenty of sunlight and hot summers. The most beautiful and varied of bulbous plants are found at the Cape, but we do not pay very much attention to them in England. Cape plants are almost certain to be introduced again in quantity in consequence of the recent rush of Englishmen to that part of Africa, so that there is some hope that many more beautiful and useful additions may be made to the few Cape Bulbs we have already. A few Crinums, Vallota, Nerines, Lachenalias, Ixias, Sparaxis, Freesia and *Amaryllis belladonna* are the pick of these, but they are only a modicum of what is known to be good among the bulbous plants of that region. Gladiolus, Watsonia, Cyrtanthus, Crinum, may be indicated as genera of which the few known in cultivation are only a small fraction of what are known to botanists. Only last year three new and very beautiful species of Gladiolus and one of Cyrtanthus were added to the cultivated collections at Kew, where their distinctness at once attracted the attention of specialists.

Gesneriads.—The Belgians can teach us how to grow these plants. In the nurseries of Monsieur Louis Van Houtte one may see house after house filled with beautiful examples representing scores of different genera, such as Gesneria, Dicyata, Ligeria, Nægelia, Tydœa, etc. The bright colors and great variety of the flowers of all these plants are charming, and they are so easily cultivated that beginners can grow them quite successfully. Monsieur Van Houtte says: "From July to October our houses are filled with every kind of Gesneriad in flower. They are mostly the result of hybridization in our nursery. Their colors are bright and charming, and, without exaggeration, they may be said to include all the colors of the rainbow."

I am indebted to Monsieur Van Houtte's manager, Monsieur Eckhaut, for the following details of cultivation as practiced by him:

Plant all the tubers in small pots on March 15th in light soil. Give little water at first, and keep the temperature of the house at about seventy degrees. In about a fortnight plunge the pots in a hot-bed of about eighty degrees, and in six weeks from the time of starting the plants should be repotted into three-inch pots. This time use a compost of rotten horse-dung or cow-manure, two parts, and one part of peat or leaf-mold, with a good sprinkling of silver sand. "But don't be afraid of manure, for these plants revel in it." Give them a temperature of seventy-five degrees now and plenty of water. Repot again in a month, and, after plants are established, give plenty of sun and air.

I have seen these plants as grown by Monsieur Van Houtte, and very charming they are.

Anthurium Scherzerianum.—I recently saw in the garden of Monsieur Warocque, Mariemont, near Brussels, a magnificent group of large specimen plants of this Anthurium. Each plant was a yard or more in diameter, and bore from thirty to sixty flowers. They were all of the very best varieties, the spathes being exceptionally large and banner-like, and rich in color. The plants entirely filled a large lean-to house. The value of this Anthurium was never more abundantly demonstrated, for the house itself was a beautiful picture; the flowers are of the very best for room-decoration, as they remain fresh several weeks when cut and placed in water. Would not this plant be a good subject for the grower of flowers in quantity for market? It is easily managed, it blooms freely and regularly every year, and its flowers have sufficient brightness of color and singularity of form to recommend them to every one.

Cacti.—These plants have hitherto been so neglected by English horticulturists that they are scarcely ever seen except in botanical gardens. There is, however, a prospect of their becoming popular again, as several of the London nurserymen have begun to grow them, and one firm—namely, Messrs. Carter & Co., the well-known seed merchants—have issued an illustrated catalogue of the most striking species. Meanwhile, in Germany, Cacti have become so popular that a monthly journal is to be devoted entirely to them, under the title of *Monatsschrift fur Kaktunkundi*. It is edited by Paul Arendt, and issued from Berlin, and every number contains an original drawing of a Cactus. The first number contains articles upon 1. Cacti at Exhibitions; 2. Watering Cacti; 3. *Mamillaria longimamma* and *M. uberiformis;* 4. *Echenocactus contractus*, with illustration; 5. Soils for Cacti; 6. How and Why Cacti are Grafted; 7. Notes on Cacti.

Tree Pæonies.—At several plant exhibitions held recently in London collections of varieties of *Pæonia Moutan* have attracted a large share of attention on account of the exceptional size, color and beauty in form of their flowers. Japan and China have recently contributed many beautiful varieties distinct from those previously known here, and as several of our leading London nurserymen have turned their attention to these plants they bid fair to again become popular in England. At the present time there are comparatively few gardens in which the Moutan is represented, and the only explanation one can find for this is that the plants are not known by most cultivators, while the nurserymen have allowed them to drop out of their collections. There are few more beautiful pictures in the garden than a big bush of *P. Moutan* covered with its gigantic blooms, which are developed in June. The plants are perfectly hardy in the coldest parts of England, but they require protection from spring frosts, as they begin to grow very early in the year. Almost all colors and shades except blue are represented in the many varieties we now possess. Besides their value in the shrubbery these Pæonies are useful when grown in pots and forced a little, so that their magnificent blooms are available for the conservatory in April and May. Messrs. Veitch, of Chelsea, Kelway & Sons, T. S. Ware and G. Paul are the principal dealers in these plants here.

Rhododendron Vaseyi is a useful addition to the hardy spring-flowering species and hybrids which form a conspicuous feature in many English gardens at this time of year. It has grown and flowered freely every year since its introduction to Kew, and this year its interest has been added to by the flowering in the open air at Kew of a pure white variety among a batch of seedlings procured from America. Cultivation has soon affected the character of this plant in regard to flower color, and we may reasonably look forward to soon realizing the hope held out by a writer in Garden and Forest two years ago—namely, that this Rhododendron would be the origin of a distinct and valuable race of early-flowering hardy kinds.

Kew. *W. Watson.*

Fig. 48.—A Fountain at Potsdam.—See page 266.

Cultural Department.

A Home Supply of Tree Fruits.

THE selection of fruit-trees for a private orchard will be controlled by quite different principles from those that govern in the planting of trees for the production of market fruits. For these, standard, well-known, productive and vigorous kinds must be taken, in order to secure profitable results. In the home orchard none of these requirements need recognition, since the grower is also the chief consumer of its products, and home tastes and needs stand prominent. Very few of our choicest tree fruits of any species are as profitable when grown for market as the coarser sorts. Even for the most select trade, beauty in fruits is essential, for decorative effect upon the table is as much sought after as intrinsic quality. I do not mean to say that quality is immaterial anywhere; but where very plain and insignificant-looking apples, pears, peaches and plums are actually the choicest in flavor, and this is really true in many instances, their high quality alone will not suffice to make them profitable.

In small private orchards there is usually no difficulty in giving the highest culture, and the choicer varieties seem particularly to require this in order to reveal all their merits. Many sorts that would be very unprofitably planted in an orchard receiving only moderate care, may be made more

productive by extra attention. Even in fruits, the rule prevails that the best are the most costly.

The rule to limit planting to a few standard sorts has no validity in the private orchard. One may set as many varieties as one fancies, and may be continually adding to these as experience gives knowledge. Usually, unless at a distance from markets, it is not desirable to plant many culinary sorts, as these can be often more cheaply purchased than grown, especially where space is limited. But it must be remembered that some of this class are much better for special purposes than the best kinds grown for eating out of hand. This is particularly true of pears and peaches, grapes and strawberries. Firm-fleshed fruits that retain their shape in cooking are universally preferred. These may be sometimes much improved by being cooked in the juice of finer dessert sorts.

Selections will necessarily be controlled by the requirements of climate, but this rule is less severe in the private than in the commercial orchard. By choosing a sheltered spot, and by top-grafting on hardy stocks, the private grower will be able to succeed tolerably with many sorts that it will not pay to plant for the market. I should be disposed to advise those who are about to begin the formation of their home orchards to select some of the best varieties of their own neighborhood —the fancies of their childhood, perhaps. There are a large number of excellent sorts in every long-settled locality that are not generally known, and which would perhaps grow nowhere else so well. I should counsel the avoidance of too many trees of a single sort, however good. One tree, when it is well established, will usually produce all of its sort that a single family will utilize, while variety is always agreeable. Besides, where a good many varieties are grown, we are more sure to have a good supply every year.

Those who are not familiar with varieties will desire to have some suggestions as to their particular choice in this respect; but in a periodical of wide circulation it is difficult to give lists suited to various sections. Local inquiries will give the most satisfactory results, but as our American Pomological Society has a membership of continental extent, a selection from the best tree fruits on its list is here appended. The early varieties are named first, and so on to the last named, which are the latest sorts.

Apples.—Summer Rose, Yellow Transparent, Early Strawberry, High Top Sweet, Primate, Early Joe, Garden Royal, Fall Wine, Porter, Chenango, Aromatic Carolina, Haskell Sweet, Rambo, Gravenstein, Fameuse, Shiawassee, Wealthy, Wagner, Yellow Bellefleur, Hubbardston, Jonathan, Lady's Sweet, Melon, Buckingham, Baltimore, Grimes' Golden, American Golden Pippin, Newtown Spitzenberg, Mother, Northern Spy, Swaar, Hunt Russet, Romanite, Westfield.

Pears.—Bloodgood, Clapp's Favorite, Madeleine, Dearborn, Giffard, Quimper, Rostiezer, Tyson, Souvenir, Ansault, Bartlett, Andrews, Bilboa, Boussock, Clairgeau, Comice, Dix, Foster's Seckel, Frederick Clapp, Gray Doyenne, Dr. Reeder, Dana's Hovey, Doyenne d'Alencon, Easter Beurré, Josephine of Malines, Lawrence, M'Laughlin, Winter Nelis.

Plums.—De Montfort, Hudson Gage, July Green Gage, Belgian Purple, Bradshaw, Denniston, Green Gage, Imperial Gage, Jefferson, Lawrence, M'Laughlin, Prune of Agen, Smith's Orleans, Washington, Bavay, Coe's Late Red, Coe's Golden Drop, St. Catherine.

Peaches.—Alexander, Amsden, Beatrice, Cole's Early, Early York, Hale's Early, Tillotson; Albert, Amelia, Early Grosse Mignonne, Royal George, Thurber, White Imperial; Alexander Noblesse, Coolidge's Favorite, George IV., Grosse Mignonne, Malta, Morris' White, Oldmixon Free, Oldmixon Cling, President, Susquehanna, Van Zandt, Wheatland; Cook's Late, Crawford's Late, Druid Hill, Heath Cling, Hyslop Cling, Late Red Rareripe, Petite Imperial, Stump the World.

Cherries.—Belle d'Orleans, Early Purple, Knight's Early, Rockport; Osceola, Belle de Choisy, Bigarreau, Black Eagle, Black Heart, Black Tartarian, Coe's Transparent, Elton, Governor Wood, Hovey, Napoleon, Olivet; Reine Hortense, Downer's Late, Red Jacket.

Newport, Vt. *T. H. Hoskins.*

Bagging Grapes.

At the last meeting of the New Jersey Horticultural Society, Mr. W. H. Goldsmith, of Newark, read an instructive essay on Grape-culture. The following extracts from it show that the practice of covering the clusters with paper-bags has not yet been abandoned in the most successful vineyards:

Next to spraying, I consider bagging as an essential in profitable grape-growing. With me it is not only equally important, but more so, and if I could not use both I should use bags in preference to the Bordeaux mixture. In fact, I have done this when circumstances have given me but one selection. In the use of bags I have had an experience of several years, and so pronounced has been my success with them that I can unhesitatingly recommend the practice as one of the most efficient safeguards to the preservation of the crops. In 1884, out of a vineyard of 700 Niagaras, we bagged the fruit on about 200 vines. During the summer the foliage on the entire vineyard was almost completely obliterated by mildew. The fruit not bagged became hard and did not ripen, while the clusters over which the bags had been placed ripened nicely and were finely flavored. This one experience settled in my own mind the value of bags, and ever since I have used them. The summer and fall of 1889 were perhaps as trying to vineyards as any in the memory of the members of this society, and yet I had grapes as finely flavored and as well ripened as I have had at any time since I began their cultivation. Owing to bad weather I had succeeded in putting on but one spraying of Eau Celeste over the entire vineyard, and making but one application of the Bordeaux mixture upon about one-quarter of my vines, but I had succeeded in getting bags on nearly all my fruit. Of course, in such a season, it is almost impossible to get ahead of the mildew, and it even affected grapes that were bagged, but when my fruit was placed alongside of fruit that had not been bagged it needed no second view to determine what had been the effect of the treatment. The work of putting on bags is no small item; indeed, it is one of the costliest necessities. During the past season I put on about 66,000 bags at a cost of $130. Aside from the matter of cost, the work itself must be done not only during the busiest season of the year, but, to get the best results, the period during which the bags should be applied is comparatively short. As soon as the clusters have set, the work should begin, and be pushed as fast as possible until completed. If it could all be done at once it would be much better, as the sooner the bunches are covered the less danger will there be of loss from mildew. In the early part of last season I put some bags over clusters that had not bloomed, and found it answered as well as where the sets had already formed. In no case, however, should the work be done while the Grapes are in blossom.

It might be supposed that those bags are best which are least susceptible to the destroying influences of the weather. I have oiled bags and bags made of parchment which were sent me as samples and highly recommended, as, in addition to their being less liable to be destroyed by the weather, they may be taken off and used successively through several seasons. The fallacy of this is apparent when we consider that far the heaviest item of expense in bagging is the labor of putting the bags on. Wet weather does not injure the bags, as they are protected by the foliage from the direct effect of storms. The bags I use are the common manilla one and a half pound paper bags put together in the old way, with corners square, and they are so flimsy as to frequently tear down the sides while being put on the vines, and yet, when I come to take them off in the fall they are quite difficult to tear, as the action of sun and moisture has toughened them. Before the bags are put on the grapes the corners of both tops and bottoms should be cut off. This can be done rapidly by a broad chisel, and serves the twofold purpose of enabling the top to be closed up neatly over the cluster and allowing any water that may get into the bag to drain out. In putting the bag on care should be taken to pin the top above the lateral from which the cluster depends, as otherwise if the pin is put through the bag around the small stem of the cluster it will be found that the wind blowing the bag about will break the cluster from the vine. This happened in my vineyard when I first began the practice of bagging, and I had the opportunity of seeing a large number of bags on the ground, and in each one a cluster of grapes.

Aside from the question of mildew, bagging will have to be resorted to in the future to protect our vineyards from the ravages of a pest that threatens to become nearly, if not quite, as destructive as both mildew and black rot together. I refer to the small black worm which we find taking up its quarters in the grape some five or six weeks before ripening. This insect is hatched from an egg deposited on the side of the berry by a fly resembling somewhat the common house-fly. As soon as it is hatched it goes to the seeds, and after permanently injuring the berry it will go to the next, and so on until it has spoiled several. I have seen bunches in my vineyard containing scarcely one good grape. This pest has attacked our vineyards for a number of years, and is doubtless known to a large number of grape-growers. Its depredations have usually been so limited as to call for no special notice, but

during the past two seasons it has increased to such an extent as to seriously alarm the grape-growers in our section. The best and, in fact, only preventive I have yet discovered is the paper bag, as the fly will not enter it to deposit its eggs.

Grapes that have passed the summer in bags come out in the fall looking better than those exposed to the weather. The berries, being free from weather-marks, present a fresh green look.

Notes on Irises.

Spanish Irises.—These are just passing away and giving place to the "English" varieties. These bulbous Irises are among the most attractive of the family, having numerous flowers with bright colors. They are hardy in a not too wet position; a satisfactory one being the second line under the south side of the house, where the first line is preferably vines, the foliage of which will serve as a background and foil to the Iris flowers. My bulbs seem to be too close to the house, especially in a season like the present, when exceptional dryness has rather shortened the blooming season. The bulbous and Oncocyclus Irises are the most interesting of the family, and among the most interesting plants of any family. Those who grow a selection of these, however, give hostages to care, as many of them are decidedly miffy, and unless they have a suitable location, they live but decline to bloom, and the worst of it is that a location which pleases one year seems to lose its charm the next. Take, as a familiar example of the Oncocyclus section, *I. Susiana*. This is a plant familiar to gardens for several hundred years, and probably every year it has been discussed by the gardeners, the most skillful ones of this generation still continuing the annual discussion. There seems to be a consensus of opinion that the proper culture consists in planting late in a sheltered position and drying off thoroughly after blooming. With all such care, however, it will be frequently found that some slight thing, like dryness, will cause them to go blind or refuse to flower. It is a curious commentary on garden skill that one finds this Iris blooming annually in gardens where no care is given to it, the owner, happily, oblivious usually to the interest of the plant. Thanks mostly to Herr Max Leichtlin, our gardens have been enriched by a number of interesting Oncocyclus Irises—Lupina, Gatesii, Paradoxa and others of their kin, such as Leichtlinii and Korolkowi. These, with the old *I. Iberica*, are an interesting and beautiful lot for those who enjoy fine plants which are interesting in care and beauty. These notes on culture refer, of course, to growth in the open, which seems the proper place for hardy plants. Frame and pan culture of hardy subjects does not seem to me an attractive occupation, even if a crop of flowers is more certain.

Iris Pallida Dalmatica—the great Dalmatian flag—is one of the most attractive and among the largest of the family. It has broad, noble foliage, and the large flowers are of a pleasing light lavender, with an orange beard. They are freely produced on stocky erect stems, without laterals, some three to four feet tall. The plant in bloom has an appearance of distinction and beauty, and is worthy a prominent place in the garden. A delicate odor adds the last charm to this variety.

Iris Monnieri is a beardless Iris, with fragrant clustered flowers, which are light lemon-yellow. The plant is attractive, but not showy, except as grown in masses.

Elizabeth, N. J. *J. N. Gerard.*

Roses.

THE time is at hand when Roses for blooming under glass should be replanted, and early planting gives a decided advantage to the cultivator, because plants so treated have a chance to become thoroughly established before winter sets in. The system of planting in shallow benches, now so generally used, gives many advantages, not the least of which is the smaller bulk of soil to be handled in emptying and refilling, always a laborious operation, especially in hot weather. But the system has the disadvantage of requiring more frequent repairs than the solid-bed plan, and the item of lumber makes a considerable difference in the expense-account of any large establishment. As a preservative, a thorough painting with crude petroleum should be given to all the wood-work of the benches; and even a good coat of whitewash will arrest decay to a greater or less extent, and also tend to prevent the spread of fungus in the soil.

The depth of soil required for successful Rose-forcing need not exceed from three to five inches. Indeed, some of the best Roses sent into New York have been grown in benches containing about three inches of soil, the high quality of the flowers being secured by judicious feeding and regular temperature.

At the time of planting, a slight shade on the house is beneficial if the weather is very hot, but this should not be allowed to remain on the house after the plants begin to grow, for firm wood is desired rather than long, sappy growth. In the selection of plants for this purpose, of course none but perfectly healthy stock should be used; good stout plants from three-inch pots being a satisfactory size, and naturally more convenient than larger ones if the bench is very shallow.

As frequently noted before, it is not well to attempt to grow a collection of Tea Roses in a forcing-house, as all do not flourish under precisely the same conditions, but when two or three varieties are planted, and these are grown well, much more satisfaction will be given.

The Hybrid Perpetuals that were forced early in the season will now be in full growth, and require an abundance of water and free ventilation, and if intended for an early crop will soon need ripening off by a gradual restriction of the water-supply until only enough is given to prevent the wood from shriveling.

In any establishment where space is an object, the box system for forcing Hybrids is a great convenience. Under this method about six plants are set in a box three feet in length by fifteen inches in width, and five or six inches deep, and the boxes being placed out-doors until needed, when they are brought into the heat and treated much the same as pot Roses, but usually with a better result. After the crop has been cut the boxes are removed to make room for a fresh lot, and may be put in a cold frame or emptied out for replanting.

Among the Hybrids it will be well to include some of Heinrich Schultheis for early forcing. This large and handsome deep pink variety has proved to be decidedly one of the best for this purpose. By using it for the first crop, and following with Anna Alexieff, Anna de Diesbach, Mrs. John Laing and Ulrich Brunner, a good crop of blooms may be expected. After January a much more extended list of Hybrid Perpetuals may be used for forcing, but the list named will be found most satisfactory for early winter.

The dark-colored sport from Catherine Mermet, Waban, will probably be the most extensively tested novelty of the season, the sales of the various agents having been very large, and, judging from the flowers shown last winter, it promises to bear out the high claims made for it. If these claims should be verified the parent of this variety will be remarkable for having produced the best white—The Bride—and also the best pink sport thus far introduced.

Holmesburg, Pa. *W. H. Taplin.*

Myosotis palustris semperflorens.—Why is it we do not see more of the Forget-me-nots in gardens? Several of them are really good, such as *M. alpestris*, *M. dissitiflora* and others, but the ever-flowering variety I have named is to be relied on to flower for six months of summer, and is just now as beautiful as a Forget-me-not knows how to be. Our long borders were edged with cuttings rooted and planted in September last, where they grew rapidly in the fall, and they now form a band eighteen inches wide around the garden that is very pleasing, and the more so as they will flower all summer. This variety is perfectly hardy, roots rapidly either as cuttings or where it grows in the open ground. *M. alpestris* and its white variety flower about two weeks earlier, and then they are past for the rest of the season. The white Forget-me-not is not worth the room it occupies. What is known as the Giant Forget-me-not (*Omphalodes verna*) is a lovely plant where it succeeds well. I have heard of its becoming perfectly at home in old gardens in Massachusetts, but I could never persuade it to make itself contented, but purpose to try again as the opportunity to secure plants may occur.

S. Lancaster, Mass. *O. O.*

Nymphæa Marliacea chromatella.—The water-garden during the last few days has made rapid progress, and its charms draw one irresistibly to its side for the first enjoyment of the morning. Marliac's yellow Water Lily, which is now in bloom, is undoubtedly one of the handsomest and most satisfactory of hardy Nymphæas, beautiful both in flower and leaf. It has been claimed at Kew that this variety is a cross of *N. tuberosa* with a yellow kind, probably *N. flava*, and it is there known as *N. tuberosa flavescens*. From its growth here it seems more probable that it is a hybrid of *N. alba candidissima*, Mr. E. D. Sturtevant, I believe, thinking it a cross of this variety with *N. flava*.

Elizabeth, N. J. *G.*

Sweet-potatoes.—To the market buyer in the northern cities the Jersey Nansemond is the type of a good sweet-potato. The northern practice of cooking sweet-potatoes by steaming them leads to a demand for a dry potato. The Nansemond, as grown in the sandy soils of New Jersey, is certainly one of the most handsome of sweet-potatoes. Coming southward, on the eastern shore of Maryland, the Nansemond is even drier and much sweeter than the New Jersey product, and in south-east Virginia these qualities are still further intensified. In the sandy soils of eastern North Carolina the Nansemond grows so dry as to be really choking when baked. Hence the southern dislike for this variety, for southern people always bake sweet-potatoes. But the character of a sweet-potato is largely the result of soil as well as climate. This Nansemond, grown in the clay lands of Pennsylvania, just across the river, is not the potato it is in New Jersey, and even in the south, when grown on the red clays of the mountain regions it loses all the dryness which makes it acceptable to northern people, without developing the sugary sweetness which makes the southern people prefer the yams. With all my early prejudice in favor of a dry, yellow sweet-potato, I find myself rapidly dropping into a preference for the sweeter baked yams. North Carolina ought to produce the finest of dry Nansemonds for the northern markets, and probably will do so when our market gardeners cease to insist that northern people shall prefer what is relished here and try to grow well what northern people want.

Experiment Station, Raleigh, N. C. *W. F. Massey.*

Correspondence.

The Preservation of Beautiful and Historical Places.

To the Editor of Garden and Forest:

Sir,—The interest which has been awakened in the preservation of beautiful and historical places is certainly extending, and it is worthy of all possible encouragement. The Waverley Oaks at Belmont, near Boston, whose story is so well told in Garden and Forest, vol. iii., p. 85, and which were so admirably illustrated in the same number, ought by this time to have been saved beyond any possible accident. The entire region which they occupy is a most interesting one, not only to the botanist but to the geologist, and, in fine, to every lover of the beautiful. It was not, however, my object in this article to dwell upon the Oaks, although pages might be written upon their value, but to call attention to a charming bit of wild scenery in their immediate neighborhood, which should by all means be included with the territory containing the famous trees. This consists of a wooded dell, through which runs a brook having, in the course of 200 feet, a descent of fifty or sixty feet. The stream at the commencement of its descent is caught in the jaws of a rocky ravine, which narrows rapidly for some distance, and when released the water rushes along over a comparatively level rocky bed among the roots of the bushes and wild grasses that wave and nod to the action of the tiny eddies, until, arrested in its course by a perpendicular barrier of rock, it turns abruptly and foams and frets with redoubled speed to its final plunge over a precipice of twenty feet. Beautiful at all times, the brook, when swollen at certain seasons, is really grand and impressive, becoming a true torrent, rushing with a violence and impetuosity that would seem impossible to one who sees it in its more gentle moods. The dell, not only in the immediate neighborhood of the fall but throughout its entire length, is characterized by fine forest-trees of several varieties, by precipitous sides and rocky ledges, and clothed with a vegetation peculiar to such localities. From the heights, distant views of the surrounding country can be caught through the openings, the whole forming a scene of picturesque beauty not surpassed in many mountainous districts. The vagrant brook, emerging from the glen, crosses the public highway under a bridge, winds demurely about through the lowland, moistening the roots of the lordly Oaks, and disappears finally in distant meadows. In former years, when the property was in the possession of acquaintances, a drive to Belmont in the late summer afternoon and a view of the falls was always the special entertainment offered to our friends, and it was one which never failed to gratify.

There is another locality which for its attractions should be reserved. In the south-eastern portion of the township of Newton, close upon the outskirts of Brookline, and almost within the sound of the bells of Boston, lies the sheet of water which for two centuries has borne the name of Hammond's Pond. Encircled by its border of forests, craggy eminences and picturesque surroundings, it has retained in a remarkable degree its primitive wildness and beauty. Its peculiar secluded position, affording rest, protection and food, still attracts the migratory water-fowl in their appropriate season, while the neighboring woods and thickets are the chosen breeding-place of innumerable songsters, and in them the red fox digs his hole unscared. No poet has ever sung its praise, and yet its charms are perennial. Whether in the bloom and joy of spring, when its borders are whitened with the panicled Andromeda; in the early summer, when its surface is bright with the glossy leaves and fragrant flowers of the Water-lily; in the days of autumn, when it reflects the glorious coloring of the Maples—its vicinity has been, and is still, the chosen haunts of the botanist and lover of rural quietude. Here Bigelow, Boot, Tuckerman, Emerson, Oakes and others have discovered and described countless specimens of its abundant flora; here, too, scholars of less note have found inspiration and encouragement in their communion with nature.

Beyond the western boundary of the pond is a large grove of Hemlocks, remarkable for their great size, height, symmetry and beauty, the approach to which is over a wooded hillside and by a descent through a narrow ravine. Within the grove, and on its southern border, is a craggy peak made up of large fragments of rock piled one upon the other in a confused Titanic mass. Within the crevices and cavities thus formed upon its northern slope, and protected from the sunlight by the deep shade of the trees, masses of snow and ice linger long after their disappearance elsewhere, while Ferns and other shade-loving plants grow in profusion, forming with the lichens and mosses a "rockery" that no art could imitate. From its summit wide stretches of country, embracing the graceful outline of Wachuset, and the bolder one of the Great Monadnock, in the far horizon, are visible, while all about is yet a forest-region, with grassy paths and openings, but partially invaded by dwellings and farms. No doubt there are districts of interest and value lying within a short distance of many towns and cities. It would be wise to secure them for public use before they are destroyed, as they certainly must be. No better investment than such a purchase could be made, and in many cases the cost would be comparatively trifling, if an effort were made to secure the land without delay.

Chestnut Hill, Mass. *Daniel Denison Slade.*

Recent Publications.

The Silva of North America, a Description of the Trees which grow naturally in North America, exclusive of Mexico, by Charles Sprague Sargent, illustrated with figures and analyses drawn from nature by Charles Edward Faxon, and engraved by Philibert and Eugène Picart. Volume II. *Cyrillaceæ–Sapindaceæ*. Large 4to, pp. 117; 47 plates. Houghton, Mifflin & Co., Boston and New York.

The second volume of this work, which has just been issued, equals its predecessor, noticed in these columns six months ago, at the time of its first appearance, in the high quality of the descriptive matter it contains and in the faithfulness and beauty of the illustrations, which are not surpassed by those published in any work devoted to the natural history of the New World. The trees belonging to four only of the natural families of plants are included in this volume. These are the *Cyrillaceæ*, the *Celastraceæ*, the *Rhamnaceæ* and the *Sapindaceæ*. Two of the three genera of Cyrillaceæ are represented in the North American silva by Cyrilla and Cliftonia, both monotypic and both found in the southern Atlantic and Gulf states, although Cyrilla occurs also in the West Indies and in Brazil. They are both small trees and both are ornamental, especially Cliftonia, which is evergreen, and which covers itself in the spring with short racemes of pale pink fragrant flowers. The Titi, as this tree is called where it abounds, is a feature of the vegetation in some parts of the south, occupying, as it does, great areas of swampy land with impenetrable thickets. Both Cyrilla and Cliftonia were, it appears, at one time inhabitants of Bartram's garden in Philadelphia; and, where the climate will permit of it, both will repay cultivation.

Three genera in *Celastraceæ* appear in The Silva—Evonymus, Gyminda, a genus separated from Myginda by Professor Sargent with a single West Indian and south Floridan species, a small tree of no commercial importance or utility, and Schæffaria, a genus of two species, one Texan and the other tropical American. The last becomes a small tree and was once not rare on the Florida keys, before the Bahaman wood-choppers invaded them and carried away all the large trunks to send to England, where the wood has been used as a substitute for Box-wood. The great genus Evonymus, in

which some forty species are now distinguished and which contains some of the most ornamental and valued of garden plants, is barely represented in the North American silva, and of the four or five species which inhabit our territory only one is admitted as a tree. This is the familiar Burning Bush or Wahoo of the eastern states, *Evonymus atropurpureus*, a small tree often met with in country gardens, although far less attractive as a garden-plant than some of the Old World species. We note, in passing, that the author adopts the early and classical orthography, and writes Evonymus after the manner of all modern continental authors, although Americans and Englishmen usually still write Euonymus.

The genera of *Rhamnaceæ*, most botanists will agree, are difficult to limit satisfactorily; and in some genera like Rhamnus and Ceanothus specific characters are not easy to find. Arborescent representatives of six genera are admitted into The Silva; of these, three are confined to the south Floridan keys, one is Texan. Rhamnus extends across the continent, as does Ceanothus, although it is in California only that species of this last genus attain the dignity of small trees. Some idea of the different views competent botanists may sometimes have in regard to plants in this family can be had from an examination of the synonymy of the plant here called *Rhamnidium ferreum*, the Black Iron-wood of the Florida keys and of the West Indies—a tree which has been referred to no less than seven different genera, to all of which it bears not a little resemblance. Professor Sargent now enlarges the Brazilian genus Rhamnidium to receive it, although it is a question whether it could not better form the type of a new genus, for where there are such wide differences of opinion about the genus to which a plant belongs, it is pretty safe to say that it does not belong to any recognized genus, and is best considered a new type.

None of the North American *Rhamnaceæ* become trees of large size, and none of them possess any great economic importance with the exception of the Pacific coast Frangula (*Rhamnus Purshiana*), here considered to include the California as well as the more northern tree. This is the largest of the North American species of Rhamnus, becoming sometimes a handsome tree forty or fifty feet high in the forests of conifers which surround the shores of Puget Sound. The bark contains to a large degree the cathartic properties peculiar to all the Buckthorns, and has become an article of some commercial importance, supplying as it does the basis of the popular remedy Cascara sagrada. Two plates are devoted to this species, the first showing the ordinary California form, with thick, rather narrow, almost persistent leaves; the other, the form with the large thin leaves developed in the moist mild climate of the north-west coast, a curious narrow-leaved mountain form found on the California Sierras, which Professor Greene considers a distinct species, and the tomentose variety of southern California and Mexico.

But that portion of the volume which is devoted to the *Sapindaceæ* will probably be found the most interesting to the general reader and to all persons who are fond of trees as trees without regard to their botanical characters and relationships, for in this family are included the Horse-chestnuts and the Maples, two genera which contain some of the most beautiful and highly esteemed of all ornamental trees. North America boasts of a number of Horse-chestnuts, Buckeyes as they are more commonly called in this country, and of these three grow to the size of trees. The genus is not a large one in the number of species, although gardens have long been decorated by a number of hybrid and seminal varieties raised chiefly from the European Horse-chestnut, a tree much more familiar to most persons, except professional botanists, than any of our native species. The true home of this plant remained, it appears, a mystery for fully three centuries after its introduction into the gardens of western Europe, and it is only in quite recent years that it has been found growing wild in the mountains of northern Greece. It is interesting to note that it reached western Europe by the way of Constantinople, where it appears to have been commonly cultivated before 1557; at least, in that year the Flemish traveler, Busbeck, then Ambassador of the Archduke Ferdinand, found it in the capital of Solyman II., and sent it to Mattiolus, in Vienna, from which city it gradually spread through Europe and North America. The fruit first known as *Castaneæ equinæ* was so called because of its reputed efficacy in the treatment of horses for broken wind. None of the American species equal the Grecian tree in size or in the beauty of their flowers, although our Alleghany *Æsculus octandra*, or Sweet Buckeye, rises to the respectable height of ninety feet, and the flowers of the California representative of the genus are extremely delicate and beautiful. More beautiful than any of our Horse-chestnuts is the curious Spanish Buckeye, a small tree of Texas and of the adjacent parts of Mexico, and the only representative of the genus Ungnadia, which, we read, is one of the most attractive and ornamental of the small trees of North America, when its branches in early spring, still bare of leaves, are covered with clusters of bright pink flowers, which enliven the sombre glades and mountain-slopes of a region in which trees and shrubs with showy flowers are not very abundant. This plant has been occasionally cultivated in our southern states, and ought to find a place in the gardens of those parts of the world where the climate is not too severe for it.

North America is not rich in the number of its Maples as compared with eastern Asia, which must be considered the headquarters of the genus, although nine species are found in different parts of the continent and are described in this volume. They are more common in the east than in the west, and, while the number of species is not great, individuals are so multiplied in some parts of the country as to make them important and conspicuous features of our forest-vegetation. This is particularly true of the Scarlet Maple and of the Sugar Maple, which are among the largest, and, economically, the most valuable trees of the genus, especially the latter, which is one of the most important of our timber-trees, besides furnishing nine-tenths of all the maple-sugar manufactured in the world. These two trees vary greatly in the size and shape of their leaves, even in a genus remarkable for leaf variation, and we should have been glad to have seen another plate devoted to the large-leaved form of the Sugar Maple, which is common in Michigan and other western states, and which varies so conspicuously from the typical eastern Sugar Maple that many observers, differing from the views expressed by Professor Sargent, regard it as a distinct species. Justice, too, can hardly be done to the Red Maple without some pictorial representation of the narrow, nearly entire-leaved form, which is often met with in the swamps of the Atlantic sea-board south of New Jersey, and which, in some parts of the Gulf states, is one of the most common forms assumed by this very polymorphous species. But of course it would be impossible to illustrate all the forms of foliage assumed by many of our trees, especially those which grow over wide areas of diversified climate. Sixteen plates are devoted to the genus. Certainly nothing can be more successful than Mr. Faxon's rendering of the graceful foliage, flowers and fruit of the Box Elder in one of the best plates of the volume, and equally good are his figures of the less familiar West Indian and Floridan Exothea and of the fruit of *Sapindus Saponaria*, the West Indian Soap-tree, "the tree that furnishes sope berries like a musket bullet that washeth as white sope." These, with another species of Sapindus and with Hypelate, complete the list of trees described in the second volume, which in conscientious research, in the wide range of learning and the sound judgment displayed, is altogether a credit to American scholarship.

It is dedicated to the memory of George Engelmann, the German physician, who made for himself a home in St. Louis, and, in the hours snatched from a large and successful practice, found time to become one of the wisest and profoundest of the botanists who have studied the American flora, and the acknowledged authority upon some of the most difficult families of plants. A worthier name could not be put in the place of honor in a volume of this character, for no man has ever studied our trees more faithfully or gathered together so much information about the Oaks, the Pines, the Junipers and the Firs of the silva of North America.

Notes.

A school of biology, in connection with the Sea-side Assembly, will be opened on the 7th of July at Avon-by-the-Sea, New Jersey.

The Yellow-wood trees just passing out of bloom in Central Park have been unusually beautiful this year. Some of the specimens are forty feet high and nearly as broad.

The great Chrysanthemum exhibition which is to be held in this city the first week of November will cover 30,000 square feet of surface. $6,500 have been offered for premiums.

The twenty-third session of the American Pomological Society will be held at Washington on the 22d, 23d, 24th and 25th of September next. Secretary Brackett promises that the official programme will be issued at an early day.

At the Geneva (New York) Experiment Station some careful tests were made last year between imported and American-grown seed of Cabbage and Cauliflower, and the result con-

firmed the experience in other stations, that the seed grown in Puget Sound, Washington, and on Long Island was equal, at least, to the best imported seed.

Taste has indeed changed since the middle of the seventeenth century, when Sir Christopher Wren wrote from Paris: "Fontainebleau has a stately wildness and vastness suitable to the desert it stands in." Who now would think this palace architecturally "wild," or characterize as a "desert," the beautiful forest that surrounds it?

The *Maryland Farmer*, in advocating the advantages of intensive culture, states that an irrigated vegetable-garden two and a half acres in extent, in the suburbs of Paris, employs three men, two women and a horse, the work of the latter being to pump the water into the reservoir for distribution and to draw the loaded cart to market before daylight in the morning. The average product of this little garden, at Paris prices, is $4,000 a year.

At the last session of the Minnesota Legislature some thirty-five sections of land were set apart, to be known as the Itaska State Park, and dedicated to the perpetual use of the people. Under the act a commissioner is empowered to procure for the state from the owners of land within the limits of the park concessions to the state by contract or deed, subject to the approval of the Governor. When any tract of land within the limits of the state park cannot be secured in this way the commissioner is authorized to institute proceedings to condemn the land and to convert it to use as a park.

Mr. A. L. Hatch, writing from Hill Crest Experiment Station, Wisconsin, to the *Rural New-Yorker*, in regard to the sunscald of Apple and other fruit-trees, says that the best remedy in that region has been found to be "medicated straw." Straight Rye straw, which has been dipped in whitewash containing some carbolic acid and Paris green, is set about the tree closely and extended up among the branches as far as practicable, being tied in several places. Thus prepared and put on, the protection lasts several years, or until the growth of the tree will make its renewal desirable. The medication serves as a preventive of injury from insects, mice, rabbits and borers.

A circular has just been issued by the Division of Entomology of the United States Department of Agriculture which gives in the space of half a dozen pages condensed information concerning several of the more important insecticides. Formulas are given for preparing kerosene emulsions, resin washes and arsenical mixtures, together with directions for their use and the necessary cautions to be exercised. Of course, all the points given here have been published before, but the department is doing good service by issuing in this available form answers to those questions which experience has proved are most often asked by correspondents when they begin to look about them for help against some invading insects.

A late bulletin of the New York Agricultural Experiment Station reports renewed success in using potassium sulphide, or liver of sulphur, as a remedy against Gooseberry-mildew. Liver of sulphur costs less than twenty cents a pound, and as only half an ounce of it is dissolved in a gallon of water this is an inexpensive remedy, since one gallon will spray ten or twelve large bushes if applied with the usual spraying nozzle. Of course, where a few plants are sprayed with a syringe more of the liquid will be required. The spraying should begin as soon as the leaves unfold, and should be repeated every fifteen or twenty days. Gooseberries are among the most desirable of fruits for home use, and they are very remunerative as market crops where they can be grown, for buyers are willing to pay almost any price for bright green fruit.

In Tulare County, California, near Lindsay Station, Mr. J. J. Cairns is preparing eighty acres of land to be planted in fruit. The land is a mixture of clay and sand loam, so that it is easily tilled, but has never been irrigated, and, for lack of facilities, it must be watered, if at all, with a pump from wells. It is necessary, therefore, that the land should be placed in the best condition for holding water, and Mr. Cairns took off all but two plows from his gang, weighted it, and sent it into the soil to a depth of from twelve to thirteen inches with the aid of a ten-mule team. Following this team came a subsoil plow, to which fourteen mules were attached, and this tore up the subsoil to a depth of thirty inches from the surface. These statements are given on the authority of the *Tulare Register*, and if the land does not absorb and hold all the moisture which falls upon it from the skies, or any other source, there is no efficacy in deep plowing. This piece of land will be watched with interest for a year or so.

In an article published in the *Journal of the Royal Horticultural Society*, Mr. Maurice L. de Vilmorin states that a single manufacturer in the year of 1889 preserved 400,000 kilograms of sorrel, a salad herb which is as much appreciated in France as it is neglected in England. This was said to illustrate the statement that France raises so many vegetables, which from their nature are not qualified to undergo long journeys, that factories are found everywhere for preserving them, and that their good quality, combined with the care taken in their manufacture, gives them a market value throughout the world. Not only green peas, French beans and tomatoes are canned in immense quantities, but asparagus and several other vegetables, including the sorrel above mentioned, are similarly treated, and three-fourths of the product is exported.

Interesting as showing the prevailing fashion in tree-planting in New England, is the account of the census of the Salem trees made in 1859, when it appears 2,651 trees were standing in the city streets, and that of these 1,656 were Elms, 353 were Maples, and, strangely enough, 110 were Cherry-trees. "The total disappearance of these Cherry-trees, as they were removed owing to the nuisance caused by the foraging of boys," Mr. Robinson suggests, "is an answer to those writers who advocate the planting of fruit-trees in the public streets." But in other countries, where boys are better disciplined than they are in the United States, fruit-trees are successfully and very profitably grown along the borders of the highway, and such trees in Germany and other European countries have proved most profitable investments both to abutting land-owners and to village corporations.

The Metropolitan Museum of Art has now been opened for two successive Sundays, and has been visited by probably 25,000 persons, a large proportion of whom were evidently working people who are unable to visit the galleries on week days or evenings. It is a noteworthy fact that the examples of work in wrought iron, which few persons on week days stop to glance at, were constantly surrounded and discussed by groups of workmen. Why should there not be a movement toward the Sunday opening of the Museum of Natural History, where artisans of many kinds might find pleasure and profit? The Jesup collection of American woods, for example, is interesting to the botanist and the landscape-gardener, but it has also a mine of information and suggestion for the carpenter, the cabinet-maker, the wood-carver and the architect. It is argued that admission to these museums on Sunday may lead to the toleration of amusements of a less elevated character; but it is not so probable that the opening of the libraries and the museums will prove "an entering wedge for the admission of the Continental Sunday" as it is that such opportunities will open the hearts and minds of workingmen to the admission of new light which will increase their knowledge, intelligence and ambition. The so-called experiment of Sunday opening has been tried in Boston and Philadelphia for fifteen years, with great advantages to the people who have availed themselves of these privileges, and the Continental Sunday has given as yet no signs of its arrival.

Dr. J. A. Lintner writes that the Pear-midge, *Diplosis pyrivora*, has appeared in Catskill, where it is said that ninety per cent. of the fruit on the Lawrence trees in one orchard are affected, while other varieties, like Anjou, Seckel, Bartlett and Bosc, are attacked to some extent. Hitherto this most dangerous enemy of the Pear has only been reported in one locality in the United States, that is, at Meriden, Connecticut, where it was probably introduced some ten years ago in Pear-stock imported from France, and, a few years thereafter, almost entirely destroyed the crop on the Lawrence and seriously injured other varieties. Effort was made to exterminate it before it spread farther by picking the entire crop in an off year and destroying it, and it was believed that the pest had been brought under control. So far as ascertained now the invasion is confined to an area with a radius of about three miles, but it may be much more extensive. Fruit growers in New York state and elsewhere are requested to make search on their Lawrence trees first, and then on other Pears, and report the result to Dr. Lintner, at Albany. The infested fruit can be recognized at once by the fact that its upper three-fourths is enlarged and irregularly swollen, and has a different color from its base. When cut open perhaps from ten to twenty pale yellowish footless larvæ will be disclosed, each about one-tenth of an inch long and pointed at the ends, much resembling the larvæ of the Wheat-midge. If this pest is confined to a few localities Dr. Lintner thinks that it can be exterminated by united effort.

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Village Woods.

ALMOST every week we hear that one or more of our thriving young cities have been enabled by some special legislation to acquire land to be used in the future as a public park. Very often it is the case that this land includes some picturesque glen through which a brook flows, or some old forest, or a lake-front or other natural feature of peculiar interest. This is all commendable, and there is no danger that too many parks will be made. Indeed, in almost every case which has come under our observation it is probable that the investment will pay a substantial money return in the improved value of property, without counting the still greater advantages which will come to the city of the future from the increased health and comfort and enjoyment of the citizens.

In smaller towns, too, there is usually some square or green which is utilized as a place of public assemblage, and which is bright with grass and flowers and attractive with the shade of venerable trees; but it rarely seems to occur to the inhabitants of smart villages that some public ground would be to them a most valuable possession. In many cases there is a neighboring grove to which the villagers resort for public gatherings. Of course, this is in private hands, but the people are welcome there when Fourth of July is to be celebrated or on such occasions as Sunday-school anniversaries, and farmers' picnics, and harvest-homes. We can call to mind several bits of woodland which serve a purpose like this, and which visitors always have in mind when they think of the villages near which they stand. But woods are never safe in private hands, and when the time comes, as it too often does, that the grove is felled for firewood or for lumber, the destruction of the trees is felt to be a distinct public loss.

This train of thought has been suggested by what has recently happened in a thriving village in northern New Jersey. Within a short walk of the town-hall a beautiful grove of hard-wood timber, some ten acres in extent, has stood as long as the oldest villager can remember. Through the kindness of successive owners it has been practically a public park for all, and in its shade have been held neighborhood gatherings of every sort for generations. It has been the haunt of the school-children, where spring flowers and autumn leaves were gathered. Visitors from the city have found in it a special attraction in a region which is in itself distinguished for rural beauty. In short, a great many people, when they think of the village, will think of this grove as one of its prime attractions. But the owner has been offered what he considers a fair price for the timber, and the grove is doomed. When the gray old trees fall the country-side will lose much of its beauty, and the village will be bereft of one of its most interesting features.

In such a case as this it seems plain that it would have been a public benefit if the grove could have been spared to the village. Of course, it is not every owner who can afford to give his property for the general good, but certainly the purchase of such a grove by the village would have been from every point of view a wise outlay of public money. Perhaps it would not have been difficult in this instance if any public-spirited citizen had taken the matter in hand to have raised sufficient money to save the grove, but in most states there is no way in which unincorporated towns can get possession of tracts of land for such purposes and hold them. In the state of New York there is a law which permits an association of citizens to hold land for public use and to appoint their own successors. Under this law landholders are encouraged to make donations of property to public use, and associations can be formed to buy such property where purchase-money is needed, and for this reason the action of the Legislatures of New York and Massachusetts, which makes such transfer of land possible, is to be commended.

But, in addition to laws for securing such village common-woods or public parks, there is also needed a more general feeling that they are worth having. Every one admits the advantages of securing some bits of rural scenery for the use of people in crowded cities. But people in villages are not shut out from the enjoyment of rural scenes. It is their privilege to see grass and trees, and to have familiar intercourse with natural objects, so that the commanding arguments for city parks do not apply to their condition. But, after all, the advantages of some common meeting-ground, for one purpose or another, are very obvious, and those villages which bestir themselves to save from destruction the groves or glens with which their names are associated will never repent of the labor and money expended in the cause. There is no question that such an acquirement of common property will pay in a broad way. It will give a stimulus to local pride and public spirit. It will strengthen the ties which attach the young people to their homes and to home interests. It will promote social feeling and neighborly kindness. It will add to the reputation of the village for enterprise and forethought and general enlightenment, and it will help to secure for the neighborhood that good name and fair fame which is to be as highly prized by a community as by individuals.

THE timber in the grove alluded to above has been sold to the owners of one of the portable saw-mills which are moved around from place to place in northern New Jersey and are making a market for the little collections of trees left standing upon the farms of that region. For many years these saw-mills have been helping to supply the market with hard-wood timber from Indiana, Ohio and that part of the country, but it is only of late years that they have invaded the east. In the aggregate they cut over an immense area of land, and as their proprietors are shrewd enough to combine for holding down the prices, the growing scarcity of timber is not felt in the market. These little supplies, gathered in from various sources, keep the market full, and this full market is constantly used as an argu-

ment against the assertions that are made by prudent men concerning the gradual destruction of the timber of the country.

If the trees on these scattered woodlands were allowed to grow up again the work of these portable mills would not be so much of a calamity, but, too often, when farmers find their trees cut away they endeavor to break up the land and add to the area of their cultivated fields. As a rule, too much land is already under the plow, and this new clearing simply means a few more acres of poorly tilled land and no increase of income. That is, the farm would generally yield a larger income if the wood had been allowed to stand, and if the labor and money put in the new ground had been expended upon that already under tillage. Indeed, in a great many instances it would be profitable for the farmers of the country to allow the broken, or sterile, or stony portions of their land to grow up in timber, and give more thorough culitvation to what remains. Where these mills have been operated for any considerable time one can see that the country loses much of its beauty, which is a more important matter than it seems, for a well-wooded country has attractions for city visitors and city buyers which enhance the value of real estate to an appreciable degree. But, besides this, it may be questioned whether the opening of the country to the sweep of the cold winds in winter, and drying winds in summer, does not have an appreciable effect on the general fertility of any region.

But, after all, these voracious little mills are only one other device used by this generation in its haste to get rid of its inherited forests. There is little reason to hope that any salable tree will be allowed to stand. The promise of future forests in the country seems to rest with the children, and depends upon their proper education. Who is to write the school-book which shall inspire our future citizens with an adequate appreciation of the value of forests as a natural resource, and of their functions in relation to soil and climate and health? Not the least of the benefits of early instruction of this sort would be its help toward establishing a personal friendliness for trees and toward the creation of a public sentiment which will protect them from wanton destruction at least.

Mr. John Robinson has begun, in the *Salem Gazette*, the publication of a series of articles on "Our Trees." From the first of these papers it appears that there are about 125 different trees growing naturally or cultivated in and about Salem. Of these sixty-four are natives of eastern Massachusetts and seventeen come from the other parts of the United States. Salem is, therefore, a very good centre from which to study trees, and Mr. Robinson's papers cannot fail to stimulate much interest in the subject. In the introductory article Mr. Robinson calls attention to the fact, which has often been insisted on in these columns, that people who are familiar with humbler plants, and this applies, too, to learned botanists, have a very slight acquaintance with trees. "Nearly every one," he remarks, "can tell an Elm from an Oak or a Willow from a Pine, but the difficulty seems to be in telling the Oaks and Pines apart, to distinguish the Pines from the Spruces or the Birches from the Hornbeams, or separate the many foreign trees in cultivation from the native species." "And a little observation," he tells us, "will serve to fix nearly all of these trees in mind and add much pleasure to town walks and country rambles. When a good example of some tree is found it should be carefully watched from the earliest warming up of its blood, so to speak, by the spring sun through all its various phases of bursting buds, flowers and fruit, and falling of its leaves. Methods in observation are thus acquired which can be applied to other things in life. By this out-of-door study much more satisfactory results will be obtained than by merely trusting to match flowers or fruit to description and figures. Although books are valuable aids, Nature never will confine herself to plates, which must be typical rather than universal in their scope."

A sunset, a forest, a snow-storm, a certain river-view, are more to me than many friends, and do ordinarily divide my day with my books.—*Emerson.*

Winter Studies of the Pine Barren Flora of Lake Michigan.—V.

The greater part of the woody growth found in a Pine Barren will naturally be sought among the evergreens. Five kinds of these are present, making, with the Larch, six species of conifers. These are closely associated with deciduous trees, or have been supplanted by them, for many of the Pines and Cedars have been destroyed by fire, and Oaks and Poplars have taken their place. But when protected a new growth of Pine is made, the White Pine or the Gray Pine, according to locality and conditions of the soil. Protection is difficult in a region traversed by several railroads, and must be restricted to quite limited areas. Hence, some of the problems of forestry may be advantageously studied in a section of country no larger than the one which embraces the wild lands at the head of Lake Michigan, where the trees have to struggle with the carelessness and wastefulness of men. Groves of White Pine are sometimes seen where the ground is well stocked with thrifty trees of recent growth, from ten to thirty feet high. They have sprung up in the track of fires and maintained their place, and, if not interfered with, would in time form trunks of fair dimensions. The natural conditions are present for a Pine-forest from two to four miles wide, extending from the boundary of Indiana, eastward, into the state of Michigan. Most of this is now waste land, of little use for any produce that may be obtained from it. Once there were saw-mills in the tract cutting up Pines and Whitewood (Liriodendron), found in paying quantities.

Taking the coniferæ according to their abundance, the list is headed by *Pinus Banksiana*, the Gray Pine, or Jack Pine, as it is generally called at the west. It is limited to the close vicinity of the lake, a strip of land from half a mile to two miles wide embracing about all of it. An essentially pure wood of this species is found only on a narrow strip along the shore, where scarcely any trees except a few Red and White Cedars are mixed with it. The succession of woody plants is about as follows: Next to the beach is a fringe of Necklace Poplars (*Populus monilifera*), mostly stunted trees, often bearing fruit when only eight or ten feet high. Interspersed with these are Willows and Rose-bushes, Cornels, Grape-vines and the Sand Cherry (*Prunus pumila*). Then the Gray Pine comes in, dwarfed, and often shrub-like where much exposed, but forming trees with trunks six inches to a foot and a half through when away from the shore. Though it is usually a homely tree when standing alone, groves of it, where the ground is free from underbrush and covered with an abundance of fallen leaves or with a sparse herbaceous vegetation, possess attractive features.

Flattish reaches of this Pine convert the nearly barren sands into clean shady woods, almost equaling woods of Red Pine. They do not have the straight columnar trunk of this tree, covered with smooth reddish bark, the limbs high up and forming a close canopy, with thin, long and slender needles in brush-like tufts, but a short trunk with dark-colored, rough and flaky bark, the limbs low down and the branchlets studded on all sides with short, stiff, yellowish green leaves. They are most shapely when somewhat crowded, being spire-shaped when young and small, and when well grown making a roundish crown with their spreading limbs. As a shade-tree along a sandy road, they do well and may be quite shapely. Dr. Richardson considered Bank's Pine a handsome tree when growing in favorable situations.* Isolated upon the sand-hills, where it is buffeted by the winds, it may be only a straggling shrub or scraggy tree, standing firm till the sand is swept from off its roots and it is undermined and toppled over. Even in such localities it is frequently a picturesque object, winning respect for its sturdiness, though not admiration for its shape.

The Gray Pine in this section varies in height from a shrub, fruiting when but two or three feet above the ground, to a tree sixty feet high. Trees thirty or forty feet high are common in the denser woods away from the shore of the lake. I have measured some that had a girth of sixty inches, and those with a diameter of ten to twelve inches are frequent. The trunk varies but little in size up to the first branches when these are low, and scarcely any portion of the roots is visible above the surface of the ground, from which the tree rises like a post. It may be found producing cones when but half an inch in diameter at the ground and four feet high, bearing a few short branches at the top. But the trees are usually much more stocky than this when fruiting.

The crown of this tree is generally disfigured by the dark-

* Gordon, "The Pinetum," p. 231.

colored cones adhering to the branches. They are very persistent, and last for many years. It is doubtful whether they fall off naturally, though they may be broken from the limbs or drop off when the attachment rots away. They are more durable than the smaller branches to which they cling, for on fallen trees that have lain upon the ground a long time the cones remain till the branchlets decay, the thick and indurated scales being more lasting than the wood. They are closely sessile, and when a fresh cone is pulled off some of the wood of the supporting branch invariably comes away with it, a piece from half an inch to more than an inch in length, and often reaching to the centre of a small twig in depth, being torn out. No better proof of the growth of a flower-cluster from the wood could be desired. Even the old and dry cones do this to a less degree, or the branch breaks off before the cone can be detached. This persistence of the cones gives to an old tree the appearance of great fruitfulness, the fruit of many years being represented on it, though comparatively few cones are produced in any single year, the fresh ones often being quite scattered, or even scarce, upon the limbs. Hundreds of these old cones may be counted on a dead tree, the limbs being almost black with them, or they may look gray or grayish from the cones weathering on their exposed parts to the color of the nest of a paper-wasp. The old cones usually point downward from the limbs, and become top-shaped by the spreading of the scales, their diameter nearly equaling their depth, an inch or more across.

The newly ripened cones are from one to two inches long, conical, but usually a little curved at the end. They are of a light or yellowish brown color. The scales are thick and blunt, reddish brown within when they first open. Each ends in an oblique, somewhat four-sided, or rhomboidal plate. In the centre of the plate is a shallow pit, or eye, of a grayish color, from which many fine lines radiate to the margins. There is enough variety in their colors and markings to impart a fair degree of prettiness to them at this time. As they are often in pairs, and on opposite sides of a branch, pointing in the same direction as the branch, they have the appearance of stumpy horns scattered among the leaves.

Rudimentary cones are seen upon the branches in the winter, as they form the preceding season. These are from a fourth to a half inch in length and ellipsoidal in shape. Like the winter-buds, they are often coated with resin, which exudes freely whenever the wood is cut, and is also copious at the base of the twigs and branchlets. At these points it forms balls frequently half an inch in diameter, completely investing the branches. The resin is formed in connection with the persistent remnants of bud-scabs, encircling the twigs at their insertion, and hence accumulates there in balls. There are also seen upon the branches clusters of withered aments, which, though the tree sheds its pollen in May and June, remain till the following spring.

The seeds of the Gray Pine are small and dark-colored, with a relatively large pale-brown wing, so thin as to be transparent. Hence it is very light and may be carried far by the wind. The wing, shaped almost exactly like that of some insect, is striped along its inner edge with lines of darker brown. The seeds usually occur in pairs, and are eagerly sought for food by the White-bellied Nuthatch (*Sitta Carolinensis*). Small flocks of these birds, which become gregarious in winter, are seen flying about among the trees, searching the cones for seeds or pulling off bits of the bark under which insects or larvæ may be hidden. Their long and flattened bill is nicely fitted for this work, for the seed lies close to the scale, but the wing, dexterously snipped off and dropped, as it comes floating on the air, shows that they readily succeed in their efforts.

The position of the cones upon the branches is rather upright, which tends to keep the seeds from falling out. Though the cones mature in the fall they are slow to open, and continue to open throughout the winter, some being closed even up to spring. This prolongs the season of supply for these birds, which are quite abundant, and among the few to stay with us and make the woods more cheerful in the winter. The Gray Pine takes a wide range in its conditions of growth. Naturally a denizen of rocky ground and dry sands, it is not uncommon here in the wetter grounds. I have taken it from the scanty soil lodged in the fissures of rocks in Canada, and found it here in sphagnous swamps, growing amid clumps of Cassandra, with the Pitcher-plant at its base, its roots covered with Sphagnum and Cranberry Vines. In such wet positions it is short-lived, though it may grow to a shapely little tree, three or four inches in diameter. But in some swamps less wet it takes a place beside the Tamaracks, like this tree tall and slender when the growth is crowded, with a clean trunk devoid of limbs till near the top. Groups of such trees under these conditions are rather neat and attractive, in the winter the yellowish-green of the Pine offsetting the dense, rough spray of the Tamarack; in the summer mottling its soft foliage of lively green with a well-contrasted color.

Englewood, Chicago. *E. J. Hill.*

How We Renewed an Old Place.

IX.—PLANTING TREES ON A LAWN.

THE house at Overlea was begun in the summer of 1887, and completed in April, 1888, at which time the grading of the knoll was finished, and the lawn ready for planting and sowing.

Our first experiment, however, in moving good-sized trees was made in the month of January of the latter year, when we transplanted two large Norway Maples, given to us by a friend, on condition that we would take them away at that time, as otherwise they would be destroyed by some grading that was going on where they stood.

Fortunately, it was an open winter, with no frost in the ground, and there was no difficulty about digging. I personally conducted the procession, and insisted upon having the diggers begin at the outside and work in toward the trunk, so as to save all the little roots. It was slow and careful work, and it took all day to move two trees. They were too heavy to lift with a ball of earth, as we had no special appliances for the purpose, for the largest one measured six inches through, two feet from the ground, and had a lofty top.

After the trees were carefully uprooted their tops were cut off, until the main stems were only about eight feet high, and the branches that were left running up from them were also cut back to within a few feet of their union with the trunk. Could we have foreseen the mildness of the two succeeding winters we should have been tempted to prune them less severely. I am almost sure that it was unnecessary, but moving them at such an unusual season seemed to make it wise to give them more root than top. It will take about four years for them to get back their original stature after this severe treatment, but they perhaps have escaped risks of drawbacks by the way. Similar trees in this town, transplanted without topping, though they have lived, have shown signs of feebleness, and I am disposed to think that in the end ours will make the finer specimens.

The holes in which they were set were dug six feet in diameter and nearly five feet deep, and six or seven cart-loads of loam were put in them. A gentle rain was falling when the Maples were set; and when the roots were fairly covered and the ground trodden closely about them, water was put into the holes before they were finally filled up.

These two trees, planted on the south side of a gravelly slope, so that the moisture must run away from their roots more than is desirable, have made so heavy a growth in the last two years, that in the middle of summer we have been compelled to cut out many large branches to admit light, and to improve their shape. In addition to their density of growth, they have shot up fresh stems, between seven and eight feet long, in the two seasons they have been fairly growing, for the first summer they did not accomplish much beyond a good crop of leaves. By the end of July we look to see them grow four or five feet more, as they are fairly set, and in fine healthy condition. The ground about them has been kept open and cultivated, and is heavily enriched several times in the course of the summer.

They are so near the house that we use the broad space around them as beds for Geraniums and Heliotropes, which probably detracts a little from the growth of the trees, but at the same time improves their appearance and keeps the earth moist and well stirred up about their roots. When the season is dry they are very thoroughly watered at least twice a week, by leaving the hose to run on them from its open mouth for an hour or two at a time.

In April we moved in the same manner a Silver Maple, which has grown nine feet and ten inches, and a stocky White Willow, which has been put quite near the house to give us immediate shade, of which we are greatly in need, and which is to be cut down as soon as the Maples are big enough. This last tree has grown, in a very dry place, a dense head nine feet six inches in height, so that it is now a tree seventeen feet high.

These are the best we have to show, except a Catalpa, which has made a most luxuriant growth, for our Ash-leaved Maple, which was also disposed to make a record, has been moved twice, and so set back. But this growth on a gravel-bank,

where no one thought that trees could be made to live at all, is not to be despised. Some of the other trees have grown almost equally well, but were not so large to begin with, so they seem less important.

In that same April the generous friend who furnished us with the large Willow and Silver Maple, kindly sent us, in addition, a dozen moderate-sized trees which he was disposed to think would grow faster than the larger ones, and these were placed somewhat at random on the lawn, for they came unexpectedly, and had to be set without much reflection, so that some of them have had to be moved again.

And here we will honestly admit that the landscape-gardener would have been of great use to us, for the lack of experience gives one a feeling of uncertainty about the result of even his best-considered arrangement, which is often disquieting.

We know for one thing that we have too many trees too near together, because we never dreamed they would all make up their minds to live, and we discover that after taking great pains to make a tree grow, we cannot make up our minds to disturb it for fear it will be in the way in the future, and so we postpone the evil day. Possibly they will do better in their wind-swept situation for not being widely separated, and for the next generation, which will be unrestrained by our sentiments, we have provided some small Elms that ought to be good trees by the time the short-lived Maples are beginning to shuffle off their mortal coil. We know that the least enduring of them will outlive us, unless we emulate old Parr and the Countess of Desmond,

> Who lived to the age of a hundred and ten,
> And died by a fall from an Apple-tree then.

All we ask is that they will hurry to shelter us from the burning afternoon sun, to which our front is exposed, and when their task is done, the noble Elms, which are "a hundred years growing, a hundred years standing, a hundred years dying," shall be our monument when this house, like its ancient predecessor, shall have crumbled to ruin.

Impatient as we are to achieve miracles of growth, we might forget how much our little trees are doing were it not for a photograph taken in 1888, which shows them scudding under bare poles, that makes their present height quite imposing by contrast.

In the five years which we claimed of our critics in the beginning, we are now sure that all air of newness will have gone from the knoll, which, even the second summer, astonished the passers-by, who were most of them unused to the results that can be attained by unremitting exertions.

Against these trees we have no charges to make of either stubbornness or ingratitude; given the conditions, the results are all, and more than all, we had a right to expect. The only ones that have not been what we could wish are the Hemlocks, which object strenuously to the dry, windy situation, and only live under protest. In vain do we plant nursery trees with good roots, they dwindle and pine, and refuse to profit by their advantages. If Garden and Forest will give us any advice about treating them, we will gladly follow it. Out of over forty trees planted on the lawn and its slopes, they are the only ones that fail to give satisfaction, and we desire to get the better of them if possible.

No evergreen is so graceful and suggestive of wild woodland ways as this feathery denizen of the forest, that seems to shrink from the companionship of man. The perfume of its boughs reminds one of camps in the woods, of canoes, of Indian guides, and silent solitudes. For me it has ever a peculiar and elusive charm, and I cannot come in my wanderings upon some majestic old tree beside a granite boulder, as it loves to grow, without a thrill compounded of association and admiration. The Hemlock seems to possess every beauty that a tree can have: its form, whether it be symmetrical with youth, or gnarled and twisted by age, is always impressive and noble; the murmur of its boughs is tenderly musical, its fragrance exquisitely wild and aromatic; its very shyness has a charm that seems to breathe distinction, and, best of all, it is perennially green, so that its blue shadows on the snow give one of the loveliest tones in a winter landscape.

Why, then, since I woo it with such tender affection, such anxious care, does it refuse to grow for me? Possibly it is killed with kindness, and some wholesome neglect may be what its shy soul desires, for I notice that the little ones in the swale, half-smothered in grass, do not die, though left wholly to their own wayward devices, while the pampered specimens on the lawn lift bare and ragged branches to the sky, from out their luxurious beds of mulching, and are painfully disappointing and uncertain.

Hingham, Mass. *M. C. Robbins.*

Weevils in Leguminous Tree-seeds.

THE beetles known as weevils, belonging to the genus Bruchus, are known to live during their early stages in the seed of various plants, especially those of the *Leguminosæ* or Pea family. The Pea and the Bean-weevils are examples too well known to gardeners, grain-growers and dealers.

While many species of weevils attack the seeds of plants which are not at present of great economic value, their ravages in the seed of leguminous trees and shrubs in various regions must often be very considerable. Some of the arid, as well as the more fertile, parts of our south-western states and territories and of Mexico are characterized by several genera and species of leguminous trees, which comprise the principal arborescent vegetation over large areas. Aside from the uses to which the wood is put, the fruit of these trees is sometimes of much value to the native inhabitants of the region. This fruit is often seriously infested by weevils of several species, four of which Mr. C. E. Faxon has drawn for the accompanying illustration, together with several of the pods infested.

An idea of the abundance of these pests may be derived from the fact that out of hundreds of seeds Mr. Faxon sometimes found difficulty in getting a perfect one and its embryo for illustration in the "Silva of North America."

A better knowledge of the weevils affecting these trees will probably show other species besides those already known.

Although each is usually confined to one kind of food-plant, the same species of weevil sometimes attacks the fruit of leguminous trees belonging to different genera. These insects undergo all their transformations within the fruit, and, when mature, the beetles cut small round holes in the seed, or through seed and pod, and make their escape.

The pods and seeds of the screw bean (*Prosopis pubescens*) are ground into a sort of flour and used as food by the natives of Arizona and New Mexico. These pods often contain great numbers of the little grubs, which afterward develop into the small weevil named *Bruchus desertorum*,* or the Bruchus of the desert.

The color of this is ashy-red above and gray beneath. The wing-covers are splashed and dotted with yellowish red or darker markings, which vary extremely in different individuals, being almost entirely absent in some. It is about one-tenth of an inch long.

Perhaps, the presence of large numbers of these insects in the screw bean gives it an added richness and flavor when ground and cooked. The screw bean is also said to be infested by *Bruchus uniformis*, a large, ashy-reddish colored species much like the next.

The Mesquit (*Prosopis juliflora*), often a most characteristic tree of arid areas in Arizona and Mexico, has its pods infested by *Bruchus prosopis*, a grayish brown species, with dark markings above, and about a sixth of an inch long. The fruit of this plant, known also as *Prosopis* or *Algarobia glandulosa*, is eaten by Indians, and even by white men, but is chiefly valuable as food for horses, which eat both beans and pods.

From fruit of *Cercidium Torreyanum*, sent to the herbarium of the Arboretum, four quite different-looking species of weevils have been taken. *Bruchus amicus* came out of seed received from Texas. It is among the largest of the American species of the genus, sometimes measuring a fifth of an inch in length. This beetle is densely covered with a silky gray pubescence, which, when rubbed off, leaves the surface smooth and black, or reddish black. Seed of the same plant collected in Arizona was found to be infested by *Bruchus pruininus* and by great numbers of *B. limbatus*.

The first of these two is black, but is so covered by a fine silky pubescence that it has a bluish gray appearance. It is about two-thirds as large as *B. amicus*, to which it has some resemblance. It is said to occur on the "Ironwood-tree" of Arizona, which may mean the *Olneya Tesota*, but I have not yet found it in seed of this tree.

Bruchus limbatus is a small, stout, black species, with a broad red stripe on each wing-cover. This red stripe is variable in shape in different individuals, and it is usually more or less constricted in the middle. Large specimens are about one-eighth of an inch in length. A package of the beans of *Acacia Greggii*, sent from Arizona, proved to be utterly ruined by these beetles. Not a bean contained less than half a dozen of the insects, while twelve or fifteen was a common number, and each emerged by a separate hole.

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*Technical descriptions and references to original descriptions will be found in a paper entitled, "A Revision of the *Bruchidæ* of the U. S.," by G. H. Horn, M.D. *Transactions of the American Entomological Society*, Philadelphia; vol. iv., pp. 311-342.

It may be of interest to note that this package of seed, containing thousands of weevils, had a distinctly warm feeling, a fact which has recently been brought to notice in regard to weevil-infested peas and cultivated beans.

The fourth species of weevil which came out of pods of *Cercidium Torreyanum* was *Bruchus Ulkei*, a beetle quite as large as *B. amicus* and densely covered with a whitish pubescence, except the outer half of each wing-cover, which is black.

extracted from the flowers, and it may be worth noting that the pods sent to Dr. Hagen were represented as being exceedingly rich in tannin.

Species of weevils also infest the seed of Gleditschia, Robinia, Cercis, Leucæna and other American leguminous trees; and the larva of a large Tineid moth has been found to live in pods and seed of Leucæna and Cercidium from Texas.

Arnold Arboretum. *J. G. Jack.*

Fig. 49.—Weevils Found in Leguminous Tree-seeds.—See page 280.

1. *Bruchus desertorum*. 2. *B. prosopis*. 3. *B. amicus*. 4. *B. limbatus*. 5. Pod of *Prosopis pubescens*. 6. Pod of *P. juliflora*. 7. Pod of *Acacia Farnesiana*. 8. Pod of *Cercidium Torreyanum*.

Dr. H. A. Hagen, of the Museum of Comparative Zoölogy at Cambridge, Massachusetts, has for many years had several of the foregoing species of beetles and specimens of their work in his biological collection. These were principally collected by Dr. G. Engelmann, Dr. E. Palmer and Professor F. W. Putnam in their various collecting and exploring expeditions.

In this biological collection there are pods of *Acacia Farnesiana*, which were received from Mexico and found to be much infested by *Bruchus protractus*, a weevil resembling *B. prosopis*, but rather more slender in shape and darker in color and with heavier markings on the wing-covers. *B. amicus* also came out of these pods.

Acacia Farnesiana is now naturalized in nearly all the tropical countries of the globe. It is well known that a perfume is

Foreign Correspondence.

The Temple Show.

THE fourth great plant exhibition held in the gardens of the Inner Temple, by the Royal Horticultural Society, on the twenty-eighth and twenty-ninth of May, eclipsed everything of the kind seen here before. There may have been larger exhibitions than this, and it is possible that some departments of horticulture may have been better represented at the famous shows held by this society thirty or more years ago than they were yesterday, but, taken as a whole, the verdict of all qualified judges is, that English horticulture had never before achieved anything like this Temple show. The chief attractions were supposed to be Orchids and Roses, and

these were indeed magnificently represented. But quite as much may be said of the herbaceous and alpine plants, the Ferns, Calceolarias, Begonias, Heaths, and the many other popular flowering plants, both tender and hardy, all of which were shown in marvelous form. In spite of one of the severest and most trying of winters, followed by a spring and early summer equally unfavorable to good gardening, the condition of almost every plant shown at this exhibition was perfect. As an indication of the strength of horticulture in England the show was a surprise, even to the well-informed who expected great things. There can be no question of the claim of Orchids to the first position among garden-plants; the exhibits proved it as strongly as the crowds of visitors who gave unrestrained expressions of delight at the wonderful specimens shown by both nurserymen and amateurs. "Orchids first, and the rest nowhere" was the comment of a companion who disliked the hustling and crush which prevailed almost the whole day through wherever Orchids were staged. Public taste is not quite so partial as this, however, appearances notwithstanding. The collections of Orchids contained so many remarkable examples that much time was needed to see them all. Even connoisseurs lingered about the Orchids, note-book in hand, while cultivators hung round and wondered "how it was done." For it is not every one who essays Orchid cultivation that can accomplish such things as are to be seen in the collections of Baron Schrœder, Sir Trevor Lawrence, the Baron Rothschild, Mr. Sander, Mr. Cypher, and others. Orchids are not easily killed, it is true, but they are only rarely grown to perfection. "It is all done by looking after them," declares a master of the art, while another will tell you that "no plants are so easy to grow as Orchids, when once you understand them," truisms which tantalize instead of helping one.

The collection of Orchids from the famous St. Albans nurseries was the largest and richest ever exhibited from any one garden; indeed, I doubt if any one but Mr. Sander could make such a display. The immense houses at St. Albans are packed with all the best and richest of Orchids from almost every part of the world, and most of the plants are possessed of all the rude health which is common to newly imported pieces. With so much of the best material to select from, together with exceptional cultural skill, Mr. Sander was certain to make a fine display. But it was much finer even than could have been anticipated. From one end to the other of a tent 130 feet long, Mr. Sander had arranged a collection comprising many hundreds of plants and disposed with excellent taste. First came a large group of huge specimens of *Cymbidium Lowianum*, mixed with Odontoglossums of every kind, some of them of great beauty and value. After these came a grand group of *Lælia purpurata* in variety, full of charm and variety, as also was a cloud of yellow insect-like flowers upon strong tall spikes of *Oncidium ampliatum*. Mass after mass of striking plants, such as *Cattleya Skinneri*, *C. Mendelii*, *C. Mossiæ*, *Dendrobium Dalhousieanum*, *Miltonia vexillaria* and *Odontoglossum crispum* varieties, and Masdevallias were rendered effective by being alternated with groups of miscellaneous plants of exceptional interest. Among these latter were *Grammatophyllum Measursianum*, the most interesting, and certainly the most beautiful, new Orchid exhibited; *Cypripedium Rothschildianum* and *C. Elliotianum*, the hybrid *Masdevallia Mundyana*, the result of a cross between *M. Veitchii* and *M. ignea*; *Odontoglossum excellens Sanderæ*, *O. excellens Schrœderi*, *O. crispum Amesianum*, with many others. A very prominent feature of this group consisted of a large number of beautifully flowered plants of *Odontoglossum citrosmum*, which were suspended among elegant Palms and Ferns, so that their spikes hung gracefully and with most charming effect. It is impossible to do justice to this, or, indeed, to any of the large groups of Orchids exhibited; one can only say what was said, after a thorough inspection of Mr. Sander's group: "A wonderful exhibit, and a great credit to those who made it."

Messrs. Low & Co.'s collection followed, and contained some beautiful plants of Dendrobiums, Cypripediums, Phalænopsis, Epidendrums, etc. Messrs. B. S. Williams & Son exhibited a fine group of a miscellaneous character, Cypripediums predominating. There were also several grand specimen baskets of the white-flowered *Utricularia montana*, each about two feet through, and as well bloomed as a Pansy. Grown so excellently, this plant is almost as effective as *Phalænopsis grandiflora*. Mr. Cypher, of Cheltenham, also showed a grand group of Cattleyas, Lælias, Odontoglossums, etc.

The amateurs' exhibits were in a tent separate from that containing the nurserymen's plants. As was to be expected, the collections from Baron Schrœder and Sir T. Lawrence were remarkable for the wealth of variety and excellence of culture they revealed. Some of the plants from the famous Dell collection were marvels of floral wealth and vigor. *Odontoglossum Piscatorei*, var. *Veitchii*, the highest-priced of all cool Orchids, was there with two very fine spikes of its large, beautifully marked flowers. *Masdevallia Courtauldiana*, the pretty hybrid from *M. rosea* and *M. Shuttleworthii*; the curious though scarcely beautiful hybrid, *Miltonia Bleuiana*, raised in France from *M. Vexillaria* and *M. Roezlii*; *C. Lawrencianum Hyeanum*, the pallid variety which is so highly prized by admirers of this genus; enormous plants of Lælia, Cattleya, Odontoglossum, Dendrobium, Vanda, Ærides, Masdevallias and others came also from the Dell.

Sir Trevor Lawrence always contributes most liberally to these exhibitions, and his plants are invariably of unusual interest to the Orchid connoisseur, for they are either nearly all rarities or extremely handsome varieties. *Spathoglottis aurea*, *Maxillaria Sanderiana*, *Ærides Savageanum*, *A. Houlletianum*, *Cypripedium grande*, var. *atratum*, and *C. Fraseri* were some of the most noteworthy.

Vanda teres was exhibited in splendid form from the gardens of Baron Rothschild at Gunnersbury Park—a group of about forty plants, each from two to three feet high, and each bearing one or two many-flowered racemes. These plants had been grown in a pine frame, where they get full sunshine all the year round, with a very high temperature. Many people know this plant, with its short, fleshy, terete leaves, but comparatively few have the pleasure of flowering it. At Gunnersbury it is grown in quantity to supply cut flowers for the table as though it were merely a Rose or Carnation.

The Duke of Marlborough sent a collection of grand Cattleyas and other Orchids from Blenheim, and Mr. Joseph Chamberlain exhibited a collection of the flowers of Masdevallias which were very tastefully arranged with Ferns. Numerous other collections were contributed by some of the best-known English amateurs, almost every group being a good exhibition in itself.

Roses.—Large and well-grown specimens of some of the best exhibition Roses were shown by Messrs. Paul & Son, Cheshunt; W. Paul & Son, Waltham Cross; Charles Turner, Slough, and W. Rumsey, Waltham Cross. Among the new kinds were Danmark, Crimson Queen, Spencer, Mrs. John Laing and Souvenir R. Gounod, which seem to possess all the characters of first-rate Roses. The large specimens were of the usual compressed bush form, the only exceptions being several pretty white single-flowered kinds, which were untrained, and which were, therefore, as elegant and artistic as Roses generally are when their natural habit of growth is not interfered with. Large Bamboos and purple-leaved Maples formed a charming background to some of the groups.

The Calceolarias were marvelously well grown—indeed, they were in some cases almost too fat with flowers to look artistic. Tuberous Begonias were shown by Messrs. Laing and Messrs. Cannell, the group of double-flowered kinds from the latter being exceptionally attractive. Wonderful though these double ones are, they are less beautiful than the single-flowered kinds. Among Mr. Cannell's plants were several with flowers six inches across each way, and a considerable number of salmon-pink and pale madder colors, which, Mr. Cannell informed me, are all the fashion now. Very large groups of Caladiums, Pæonies (both herbaceous and tree), Rhododendrons, Azaleas, Anthuriums, Ferns, Leschenaultias, Pelargoniums, Gloxineas, and many others helped to fill the four great marquees provided. Mr. Rivers sent a collection of pot specimens of Oranges, Peaches, Plums and Cherries in fruit. Pansies from Scotland, Lilacs from France and Eremurus from Cork were shown, and they indicate the comprehensive character of the exhibition.

London. *W. Watson.*

New or Little-known Plants.

Crinum Asiaticum.

THIS is the largest Crinum known. It forms a conspicuous object in the Palm-house at Kew, its huge evergreen leaves being decidedly effective among Palms, Cycads and such-like plants. Its flowers, too, are ornamental, and they are produced frequently, say half a dozen times a year, on full-grown plants; they are white, with crimson filaments, and they are fragrant. The plant from which the accompanying photograph was made is five feet high and eight feet through. The large bulb is buried in the soil, but its exposed stem-like neck is a foot long and

six inches in diameter. Each leaf is five feet in length by eight inches in breadth, channeled all along the midrib, and colored bright green, with darker reticulated veins. The peduncle measures two and a half feet in length, and the head is composed of about fifty flowers, each with a tube four inches long and spreading segments nearly as long.

C. Asiaticum belongs to the evergreen group of Crinums, all of which are easily cultivated, free-flowering and attractive. They require a rich soil, plenty of water both winter and summer, and a tropical temperature. Although not much grown nowadays, *C. Asiaticum* has been in cultivation over a century and a half. It is widely distributed in the tropics of Asia, and it varies somewhat in consequence. The following are now considered to be only varieties of it by Mr. Baker—namely, *C. declinatum*, Herb.; *C. sinicum*, Roxb.; *C. procerum*, Carey; *C. anomalum*, Herb. At Kew there is in cultivation a variety with leaves handsomely streaked with creamy white. Suckers are produced abundantly by large plants, and these, if removed in spring and treated liberally, will grow into large specimens in two years. The large, fleshy, tuber-like fruits of this species are also freely produced on cultivated plants.

Kew. *W. Watson.*

Fig. 50.—Crinum Asiaticum.—See page 282.

Cultural Department.

Points of Merit in Vegetables.

Snap Beans.—Since the general introduction of the wax-podded sorts people have come to judge of this vegetable almost entirely by its appearance, the longest, whitest, handsomest pods being considered the best; but a better observation will show one that the whitest pods in the basket are by no means the whitest when cooked. If we cook the clear white pods of the Ivory Pod and the yellow ones of the Golden Wax, we shall find the latter much the lighter and brighter colored; and if we go further and taste them, there will be no doubt as to which is of the better quality. The value of a snap bean rests in its fleshy pod, and in judging of the merits of different lots we should not only look at the external shape and color, but at the flesh. This should completely fill the pod so that there is little depression between the seeds, and on cutting the pod at these points there should be no cavity seen. The flesh, too, should be firm and solid. In some sorts it is very juicy, and even watery when the pod is young, but speedily becomes spongy or pithy. Last, but by no means least, the pod should he, as the Europeans say, "free from parchment"—that is, the inner lining of the pod should be thin and without fibre, a point which is often overlooked, the observer being satisfied if there is no "string" at the back.

Beets.—Most people are content if the root is smooth, shapely and of good color, but this is by no means all. The color should be one that will hold while cooking—should be "fast"; and, secondly, the top should be small and compact, and occupying as little as possible of the upper portion of the root, because it will always be found that the portion just below the base of the leaves is harder, rank-flavored, and lacking in sugar. This is so invariably true that the French and German sugar-makers always cut off and throw away this portion (often amounting to from three to five per cent.) of the root, saying they cannot make good sugar when it is taken.

Cabbage.—In a long and large-stemmed plant we shall find the leaves relatively far apart and with large, coarse midribs; and as a portion of the stem extends up into and becomes the objectionable core of the head, it carries with it the same character, and we have a large-cored and soft-hearted head, the base of the leaves being separated in the head in the same way as below it. Again, the shape of the leaf is important. A frequent fault is, that the blade does not extend to the very base, thus giving the leaf a distinct stem. The leaves of the head will be of the same character, and, consequently, the heart, made up of the bases of the leaves, will be loose and "stemmy" at the centre, even if hard and firm at the outside. The leaves should also be abundant in number, long, and should show a decided tendency either to enclose the centre or to be dish-shaped. If not, we have a head in which the leaves do not lap by each other, forming one with either an opening or a soft spot down through the centre, through which the seed-stalk will soon push its way, the head thus becoming worthless. Lastly, the leaves of all cabbages should be thick and brittle, rather than thin and fibrous.

Cauliflower.—The common opinion is that cauliflower-heads should be smooth and flat; but Long Island gardeners, who have given more attention to this vegetable than any one else in this country, declare that the head should be round rather than flat, and as knobby as possible. They claim, and we think with good reason, that the flat umbel-shaped head must of necessity have a much larger proportion of stem than one which is in general outline nearly globular, and in which each section is also globular, thus giving a rough or knobby, rather than a smooth, head. Certainly such heads are much heavier and more solid, and we think are of better quality.

Carrot.—Few people in this country know how palatable well-grown and properly cooked carrots are, but in order to fully appreciate them one must use the small and finer-grained garden varieties, and when they are in proper condition, which is when they are young and tender, not waiting until they are nearly full-grown, as is commonly done.

Celery.—Here, as in beans, too much weight has been given to whiteness; and flavorless and soft White Plume has ruled the market. It certainly is true that excessively blanched and white celery is always of inferior quality. Often it is actually worthless, being pithy and soft. Good quality is indicated by fine grain and solidity. A person should be able to snap a stem into three pieces by taking it in both hands and giving a quick jerk with each hand in opposite directions. The break should be square, showing brittle fibre, and as little "string" at the back as may be. The flesh should be firm, solid and fine-grained, and have a rich nutty flavor. Such celery is rarely seen in the market, because of the demand for the whiter and (to the novice) more attractive kinds; but no one knows better than the Kalamazoo growers how to produce it if it is called for.—*Professor W. W. Tracy, before the Michigan Horticultural Society.*

Notes from the St. Louis Botanical Gardens.

Tigridia violacea is an interesting member of this Mexican genus, and, this year at least, is the first to flower by several days. It bloomed on the last day of May at the Botanical Gardens here. It is about one foot high, bears, in succession, several violet-colored flowers with variegated centres an inch and three-fourths wide. Not quite as attractive as *T. buccifera*, though having larger flowers, it is a fitting companion to it, coming into bloom only a few days earlier.

Pentstemon pubescens, which is quite common in this part of the country, has been in flower for fully two weeks. It selects dry situations, clay banks, mostly in half-shaded places. Just before it flowers, or late in August, seems to be the most suitable season for transplanting this species, or at least it does much better than when set in spring.

Potentilla paradoxa, now in flower, is quite an interesting hardy perennial, about two feet high, bearing at the terminus of the branches numerous flat, pale yellow flowers, a little more than an inch wide, which come in long succession.

Cerastium tomentosum, a hardy perennial of eastern Europe, scarcely a foot high, with light downy foliage and pretty delicately white flowers, is a common garden-plant and a useful one for the open border. It is quite hardy and thrives in any ordinary garden-soil.

Houstonia purpurea, at this season, when there is a scarcity of wild flowers, is one of the most attractive. It usually grows less than a foot high, in fine round clumps, with nearly white or, sometimes, pale purple flowers. It seems to be suited to any soil or situation that is not too wet, and does well in sun or shade. If the plants are taken up from their natural home in full leaf, just before they flower, they will scarcely notice the change, and will bloom as freely, if not better, than when left to themselves.

A fine clump of *Ansonia Tabernæmontana* has been in bloom in the herbaceous grounds for some time. It is not a showy plant, but it forms a nice large clump of its thick, green foliage, four feet high by as many wide, and each of the many stalks terminates with a small panicled cyme of pale blue flowers. It will do fairly well in shade, but a clay soil and full sunlight suit it here.

Phlomis tuberosa, one of the Mint family from eastern Europe, much resembles some of our American Monardas. It attains a height of about four feet, is quite hardy and easy of culture.

Cypripedium acaule, *C. pubescens* and *C. parviflorum*, all of which have bloomed quite freely here, are now past flower, and even *C. spectabile*, the last one of our natives to flower, is nearly past. These native Orchids seem to do as well here, with a little extra care, as in more northern latitudes.

One of the best plants at the garden at this season is *Crinium longifolium*, a member of the Amaryllis family, a native of India. Some plants are more than three feet high and have three or more flowering stems. Fifteen large showy flowers are not uncommon on one stem, and they come in long succession. The flowers vary in color from pure white to rose-purple, are tubular in form, six or eight inches long, and about three inches wide at the opening. The plant is perfectly hardy here, and, with a little protecting, would probably survive any New England winter. The bulbs are very large.

St. Louis. *F. H. H.*

German Irises.

Iris Germanica has been true to its season, and now follow the hybrids, known to the trade as German Irises. As is well known, these are among the most satisfactory of hardy plants. Their creeping rhizomes are proof against the severest weather, and they increase rapidly. The flowers, though not very lasting, are usually very attractive, or, at least, among their countless forms, any taste may be gratified, as they range through so wide a scale of color and markings. *I. Germanica* is not in cultivation a seed-bearing plant, and so careful an observer as Professor M. Foster is convinced that the hybrid Irises are not of its progeny; these plants being hybrids of *I. pallida*, *I. variegata*, *I. sambucina*, *I. squalens*, *I. lurida*, *I. neglecta*, *I. amœna*, *I. plicata* and *I. Ewerti*, and possibly of *I. flavescens*.

The hybrids of *I. pallida* are easily recognized by the withery white spathe valves, which lose their greenness before the bud is swollen. They vary in color from nearly pale blue to a deep blue, some having a reddish tinge. Queen of May (rosy lilac) is a familiar example of this strain. The *I. variegata* blood is seen in forms like Louise, Lila and Jenny Lind, with golden standards and purple-brown falls. Among a collection of hybrid Irises will usually be found many smoky or bronze-tinted forms, as Diana, Magnet and Nemesis. These are from *I. sambucina*, *I. squalens* and *I. lurida*. *I. neglecta* is responsible for those which have standards and falls of white, marked with purple, such as Madame Chereau; and *I. amœna* for those with white standards and marked falls, such as Fairy Queen.

These conclusions reached by Professor Foster are readily verified by any one who cultivates the species and a collection of hybrids. It is one of the features of this section of the Iris family that they possess infinite variety, giving scope for much interesting study. Some of the hybrids are so much mixed in blood that their parentage is not so easily traced as those mentioned above, and these will be likely to furnish puzzling problems to the most skillful. In the mean time these are the beautiful flowers unfolding day by day to be enjoyed, and there are few more pleasing pictures in the hardy garden than good clumps of German Iris. With clean, attractive foliage and abundance

of gay flowers, they are well named "the hardy Orchids." The flowers individually are not very lasting, but strong plants produce many blooms, and the season extends over several weeks, with a daily unfolding of new beauties.

Elizabeth, N. J. *J. N. Gerard.*

Early Peas.—Another season's trial at this station satisfies us that the green-skinned extra Early Peas of the Kentish Invicta type are not only earlier, but more vigorous and productive than the common extra early varieties of the Daniel O'Rourke type. But neither type has high quality enough to make it the best stock to work upon for improvement. In the mere matter of earliness both excel, but we ought to develop an extra early of fine table quality, vigorous habit and productiveness. Market buyers in the cities get few peas which country people consider fit to eat, and growers could make money by offering peas of high quality for discriminating customers—at least those who sell their own peas to consumers could. For home use wrinkled peas can be had for every season, but the very earliest varieties of the Alpha type come hard after the Daniel O'Rourkes. What we need is the production of some well-flavored early sorts which will bear with sufficient abundance to be profitable market sorts and supersede the flavorless extra early peas which are now universally sold.

Raleigh, N. C. *W. F. Massey.*

Alstromeria pelegrina.—Last year I noted the beauty of the white form of this plant, which is also known as the Lily of the Incas, though, of course, not a Lily at all, but one of the *Amaryllidaceæ*. The white variety is beautiful certainly, but the typical form is proving itself equally good, and much more showy than its variety Alba. The color is a soft pink, with a shade of green, and red lines. A small root imported last fall has produced many flower-sprays, and they last well when cut. This Alstromeria is not to be recommended for out-door planting, but as an in-door pot-plant. It is easily raised from seed, as these germinate much more readily than those of other kinds, but I have a suspicion that it depends not so much on the species, whether the seeds germinate readily, as upon their being recently gathered, for I know that in the seeds of the same species in the hands of different persons there was a great difference in the period between sowing and germination.

South Lancaster, Mass. *E. O. Orpet.*

Grammattophyllum Measuresianum.—This plant is now flowering, for the first time in America, I think, in the collection of Mr. W. S. Kimball, of Rochester. It is a stately plant, with enormous pseudo-bulbs and handsome, broad foliage; it also is very free in its habit of growth, and requires little attention. On the plant at Rochester a spike, four feet high, carries forty-five finely marked and well-developed blossoms. They are light yellow, profusely spotted with chocolate. Basket culture, with very little compost about its roots, a good supply of air during its growing season, and a temperature of sixty-five degrees will suit its requirements. At the great Temple Show in London, held recently, this beautiful Orchid, exhibited by Sander & Co., was universally admired and ranked among the finest in the display.

New York. *A. Dimmock.*

Correspondence.

Fruit-trees on Lawns.

To the Editor of Garden and Forest:

Sir,—There has grown up a canon that condemns the use of fruit-trees on lawns, but there seems no sufficient reason why the useful and beautiful should be divorced. A lawn with fruit-trees alone may be made very attractive, although it would be better to combine fruit and nut-bearing trees. Apple-trees scattered about and grouped on lawns with Pear-trees, Walnut, Butternut and Chestnut-trees may produce fine effects. The lawn is too often a homeless place, lacking in the hearty welcome that fruit-trees give us. I have a group of Buffam Pears that stand thirty feet tall, and are much admired, besides yielding me twenty bushels of fine fruit yearly. Other Buffams stand about my lawn to relieve the uniformity of round-headed and conical trees. This Pear is one of the best of all upright-growing trees for lawns, giving not only novelty of form, but fine foliage and color. But there are other Pear-trees of singular grace and charm. The Anjou, for example, makes a noble head. The advantages of lawns of this sort are that many who cannot afford to assign ground for lawns with ornamental trees will do so for those that return a profit. The only serious disadvantage is the possibility that by fruit-gathering some damage may be done to the foliage or important limbs broken, but with proper care there need be no such danger.

Plums do not make good trees for the lawn, as a rule, because they are short-lived, and are liable to be misshapen by the necessary cutting that removes black knot. But there are few handsomer trees than Cherries, either Murillo or Heart. But my preference has been to grow them mostly in shrubberies or on the edge of the lawns. The Persimmon forms a good crown, and adds to the number of good lawn fruit-trees. It is hardy with me in central New York, although I do not know of any trees hereabout except my own.

I agree with Henry Ward Beecher that America furnishes no sight more beautiful in all its blossoming flora than an Apple-tree in full bloom. The variety in shade and in form of petals is remarkable. I have before my window a Kirkland Apple-tree and a York Pippin. The blossoms of the former are massed like a huge snowball. The petals are long and twisted and star-like; those of the latter are broad, and held up like a saucer. The Japanese worship the Plum and Cherry-blossoms, and in our shrubberies we have nothing finer than Wild Cherries, and Wild Plums and Crab-apples, in addition to our cultivated Cherries and Plums. The finest group that I have had this spring consists of Governor Wood Cherry-trees, bordered with Late Montmorencies.

Clinton, N. Y. *E. P. Powell.*

[We are not aware of the existence, in treatises of landscape design, of any such canon as that laid down by our correspondent, and if fruit-trees are seldom used in pleasure-grounds it is probably because there are some good reasons against the practice. There are cases in which these trees could be satisfactorily planted on grounds about houses—about a farm-house, for example, with surroundings of orchards and meadows and cultivated fields. The question is one of details and particulars, and no rule of universal application can be laid down. If by a lawn is to be understood a slightly undulating body of turf with foliage so disposed about it as to make the most pleasing sylvan composition, and especially to introduce an element of obscurity and indefiniteness in its outlines, we should select the trees best suited to produce that effect, and it is difficult to see why fruit and nut-trees should be preferred to other forms of foliage, or how they could be mixed with other forms of foliage with any gain in respect to harmony or agreeable contrast. Further than this, fruit-trees, as a rule, are apt to take a formal shape, especially if they are pruned and managed with reference to the production of the greatest amount of fruit. Again, nearly all of them are more subject to be injured in appearance by fungi or insects than are those trees usually preferred for lawns. The beauty of the bloom of a Cherry-tree is evanescent, and when not in bloom a mature tree is usually very stiff and unsympathetic in its form when mingled with other trees, or it suffers from some disfigurement. Its beauty during the short flowering period does not compensate for what would be lost in substituting a Cherry for some other tree which is more desirable throughout the year. Besides this, fruit-trees, as a rule, have little beauty in the autumn. The Cherry turns slightly, and so do some of the Pears which contain the blood of the Chinese Sand Pear, but, as a rule, fruit-trees lack the beauty of our native trees in autumn, and it is very desirable in lawn-planting to take advantage of the beauties of autumn coloring.—Ed.]

A Neglected Evening Primrose.

To the Editor of Garden and Forest:

Sir,—There is a glowing California field-flower that possesses many charms, and well deserves introduction to the garden. In its season this lovely Californian Œnothera, with its dwarf growth and its compact clusters of golden bloom, appears as distinct and as striking a feature of the landscape as the great flame-red Eschscholtzias. One can almost claim that, when the Wild Poppy became the state flower, the modest merits of this perennial Evening Primrose were sadly neglected.

The other day—it was May 10th—I walked up the long seaward slopes of Berkeley. Every vacant lot and the very streets were golden with little plats of shining blossoms. I began to

remember that for three or four months this brilliant display continues; I bent down and counted the flowers and yet unopened buds on the nearest plant of *Œnothera ovata*. The plant was nowise conspicuous among its fellows that dotted the slope; in fact, many showed far more flowers and covered a greater area. The sample plant, however, made a very respectable display. The circle of its outer leaves was about a foot in diameter; they rested upon the turf, hardly rising four inches above it at any point. Fifteen open flowers rose well above the foliage, and no less than thirty-six buds could be counted without pulling the crown apart and descending to the microscopic sizes. Each of the four-petaled flowers was fully as large as a fifty-cent piece; one almost covered a silver dollar. The rich clear yellow hue, and the regularity of the petals and stamens, with the golden ball of the erect pistil, formed a charming whole.

Botanists are interested in this little Œnothera on account of its peculiarly long calyx-tube, which is never less than one inch, and usually is from three to five inches long. The ovary is concealed in the very crown of the plant, and is thus protected from accident in as complete a manner as one could well imagine. There are not many flowers of this curious type, and none is better adapted for a garden-flower. *Œnothera ovata*, if planted on the lawn in a solid bed of, say, ten feet square, would surprise every beholder by its abundant bloom and its glowing color.

Niles, Cal. *Charles Howard Shinn.*

The American Association of Nurserymen.

Annual Meeting at Minneapolis.

THE sixteenth annual meeting of the American Association of Nurserymen was held during the first week of June in Minneapolis. President Emery called attention in his address to the strength of the organization, which now numbers more than four hundred members, with abundant money in the treasury and a history which proves that substantial benefits have been received from concerted action. In regard to the condition of the business the President said: "We have to congratulate ourselves upon the improved tone of the nursery business. Nursery stock is worth from twenty-five per cent. to forty per cent. more at wholesale than it was a year ago, but this is no good reason why indiscriminate planting should be indulged in, for the fact is that the past prevailing low prices have discouraged heavy settings, and the overplus has thus been reduced, and prices raised to a point where it pays the grower to produce stock."

Mr. Emery advocated among the improvements to be desired the official adoption of a general telegraphic code by which orders could be abbreviated, and time and expense saved; and on the subject of the World's Fair he said: "The fact is patent that California is determined to control the Horticultural Department. The work of the Classification Committee, of which a member from California is chairman, is pathetic in its ludicrousness. That they assign four classes to horticulture and fourteen to viticulture shows the animus. A chief of the Horticultural Department, a Californian, has been appointed; his appointment has not been confirmed—the principal opposition coming both from his own state and from the horticulturists of the country at large. Under his management and dictation we can expect the wines, brandies and citrus fruits of California to head the procession, and her dried fruits and flavorless orchard products to occupy space that rightfully should belong to the class of fruits that are the bone and sinew, so to speak, of the business. A vigorous protest against such folly is in order, and failing to secure the recognition that our suggestions, as the nurserymen of the United States, entitle us to, we ought to wash our hands of the entire matter."

The committee who made a report on the President's address also protested against the World's Fair classification, and resolved, "That we most earnestly protest against the appointment of Mr. Walter S. Maxwell, of California, as Chief of the Division of Horticulture of the World's Columbian Exposition, believing as we do that there should be a man at the head of this great work who, by taste, knowledge, experience and acquaintance, is in full touch and sympathy with every horticultural interest of this great country."

Wm. C. Barry, of New York, E. L. Watrous, of Iowa, N. H. Albaugh, of Ohio, and Charles W. Garfield, of Michigan, were appointed a committee to meet the Board of Directors of the World's Columbian Exposition in Chicago, to present to that body the action of the Association.

Among other resolutions adopted by the Association was one commending the work done for horticulture through the Eleventh Census, and tendering thanks to the superintendent and to Mr. J. H. Hale, the special agent, for the complete investigation which had been made of the nursery interests in the United States, and requesting the superintendent to issue a bulletin report of this work similar to the one on floriculture before the opening of the fall season.

It was decided to hold the next annual meeting at Atlanta, Georgia, and the following list of officers was elected: President, J. Van Lindley, North Carolina; Vice-President, W. J. Peters, Ohio; Secretary, C. A. Green, New York; Treasurer, G. A. Whiting, Dakota. Executive Committee—W. F. Heikes, Alabama; W. C. Barry, New York; G. J. Carpenter, Nebraska.

Extracts from some of the addresses delivered at the meeting are given below:

GROWING AND MANAGEMENT OF EVERGREENS FROM THE SEED.

This subject was treated by Charles F. Gardener, of Iowa, who said:

"In growing evergreens from seed the beds are prepared four feet wide, running east and west, and raised three to four inches. Stakes fourteen inches high are driven on the north side, and twelve inches high on the south side of the beds; on these stakes are nailed strips of boards two inches wide and one inch thick. The seed is sown broad-cast, at about the rate of four to the square inch, after the soil is well pulverized by raking, and a garden-roller is run over the bed, lengthwise, twice if necessary, to firm each seed in its place in the earth. The beds are then covered with evergreen leaves to the depth of two inches. As soon as the seeds sprout the leaves are raked into the alleys between the beds, and the beds covered with white sand from one-quarter to half an inch in depth.

"Shades are made of lath put together in frames four feet square, with the lath three-quarters of an inch apart; and the frames are put on the strips nailed to the top of the stakes, the lath crossing the bed north and south.

"When the evergreen leaves are taken off, the sand is put on as fast as the leaves are removed. The leaves must be slightly shuffled back and forth while being removed, to kill the weeds that have started, and the little trees will have a perfectly clean bed to make their appearance on. The lath-frames are put on as soon as the beds are covered with sand. We never water the beds, and if cracks appear more sand is put on.

"After the trees appear above the sand, and before the seed-shells have dropped off, dry sand is sprinkled over the beds in sufficient quantity to fill all little cracks and holes that may appear. The beds should be carefully hand-weeded the first season, and if a good stand is secured the first year the weeds will trouble but little the second year.

"We leave the lath-frames on until they are needed the next season to cover new beds. In damp, cloudy weather we raise them to an almost perpendicular position, thus giving the plants all the air and light possible; they should be replaced as soon as the sun comes out.

"Trees should not remain in the seed-beds longer than one or two years. Yearling trees should always be bedded out; two-year-old trees may be bedded or planted into double nursery rows; in either case they require no shade.

"The birds must be kept away from these beds, especially from White Pine beds, or they will take every tree as fast as it makes its appearance. The worst birds with us are the blue-jay and turtle-dove."

GEORGIA AS A FRUIT-GROWING STATE.

Major Gessner, general agent of the Central Railroad of Georgia, said:

"Five years ago little serious attention was given to fruit-growing for market in Georgia. Since that time, however, railroad facilities have been increased, so that we can supply fruits very early to northern markets and place them there in good condition. As a consequence we have realized perhaps the largest prices that were ever paid for peaches in the New York market, which was twenty dollars a bushel for the earliest Alberta peaches. Usually the first shipments of peaches are made about the 20th of May. They are expressed to Savannah, and thence to New York by steamer—something like two and a half or three days' journey. Year before last the Georgia peach crop brought better prices and had a better sale in the New York market than Delaware peaches. Grapes, too, are proving profitable, and we have been receiving, for our early ones, five cents a pound at the station.

"Within the past two years the capacities of our state for growing fruit has attracted much attention. Near the centre

of the state three companies, organized in Ohio, have purchased tracts of 1,300 acres, 1,250 acres and 600 acres respectively. Mr. J. H. Hale, of Connecticut, has purchased 800 acres, while fruit-growers from New York, Michigan and other states have bought large tracts. The Albaugh Company set out at one time last winter 70,000 Peach-trees on 400 acres. It will be seen from this that there is an opening in Georgia for nurserymen. After our large peach crop two years ago many people wished to embark in the fruit business, but there were not trees enough to supply the demand, and there are not enough to-day. In this fruit-growing part of Georgia, where there are little frost, and a soil peculiarly adapted to small fruits, peaches and grapes, there is promise of great fruit-production in the future."

ROCKY MOUNTAIN EVERGREENS.

Mr. C. S. Harrison spoke on this subject. He said:

"The problem of clothing the western plains with forests is an important one. Conifers by the million have been shipped over the Missouri River, and by the million they have failed. Near the one-hundredth meridian the White, Norway and Black Spruces and the Arbor-vitæ are failures. The Scotch Pine does well while young, but in time of trial it goes down before the drought. The Austrian Pine thrives while young, but the White Pine is uncertain always. Looking down from the foot-hills of the west, and belting northern Nebraska, there is a Pine, however, which is equal for the emergency. Six years ago I brought some from the mountains and planted them in the open ground without protection. I cultivated the first year, and after that left them to utter neglect. The ground was sometimes very dry, but none died after they were established, and they averaged about a foot a year in growth; taken from the mountains they are hard to transplant. One year with another I save fifty per cent. They grow readily from seedlings, and these transplant as well as any evergreens.

"I think this Pine (*P. ponderosa*) the best for our region. The leaves are glossy and of deep, rich green, and often eight and ten inches in length. The wood is heavy and the grain coarse, from rapid growth, but it takes a fine polish, and is used for grain finish in some of the finest houses in Colorado.

"The Douglas Spruce is the great timber tree of the Rockies and Sierras. I have recently visited many of the leading nurseries of the east, and find that in rapidity of growth it led all the conifers. This tree has an almost infinite variety of form and foliage. Some trees will have short leaves, others heavy and long. Some will be light green, and others almost blue, with a frosting of silver. The mountain seedlings transplant readily, planted in the open air.

"*Picea pungens* is king of the Spruces for the first thirty years of its growth, and its silver sheen is matchless. If anything tends to retard the growth, or when old age comes on, its color reverts to green. This is a rigid tree, with stiff shelf-like branches. Only about one tree in four, or perhaps one in ten, will have the exquisite silver color. It transplants very readily. The best way to secure the finest specimens is to go to the mountains and collect the small trees with colors already established.

"Almost equal in beauty, with more of grace and softer outlines, is *Picea Engelmanni*. This is the giant of the high altitudes. It grows in a belt reaching nearly 2,000 feet higher than *P. pungens*, shooting up well to timber-line. It transplants very easily. It will resist any degree of cold, and I believe with the Black Hills Spruce it will be one of the timber-trees for the great north-west. This tree has a sheen nearly as rich as that of the *P. pungens*, and is often of a graceful drooping habit.

"*Abies concolor* is queen of the Firs. No other tree has such a rich variety of color. The Blue Spruce is beautiful while young, but this Fir holds its color. One can often see a grove of these trees with their silver gleaming miles away. Some clusters have very deep color with plentiful frosting, so as fairly to sparkle. The new shoots are of light soft green; the older growth is nearly blue. On one tree the blossoms and cones will be purple, on another light green, The clear gum exuding from the cones flashes like pearls; and when a light breeze puts all this beauty in gentle motion, you have a scene worth a journey across the continent to see."

ONE WAY TO SELL NURSERY STOCK.

Mr. G. L. Grant suggested that if florists could be induced to plant ornamental shrubs of the most attractive varieties on their grounds their customers, when they saw these shrubs in flower, would be glad to place their orders there for delivery at the proper season if they could be assured of receiving plants of the same varieties. Improper planting has been the cause of much undeserved criticism of nurserymen, and so is the frequent long exposure of the stock in unexperienced hands after unpacking and before planting. If a florist had this stock on sale he could send a man who knew how to plant it properly. In other words, it is advisable for nurserymen to cultivate closer relations with florists throughout the country, and sell through them instead of traveling agents. These agents are often unknown, and buyers have become suspicious of them; but if they could deal with some one whom they could find again and whom they knew to be trustworthy, they would feel safer in ordering ornamental trees and shrubs; and inasmuch as they are buying of the local florist herbaceous and other ornamental plants, it would be very natural for them to extend their orders to one in whose judgment on horticultural matters they had confidence. The sample shrubs and trees which the florist could have would be an inducement and an assurance to purchasers who have been deluded with colored plates. Besides this, it is well known that trees and shrubs will thrive in one section better than in another. The local florist, being in the vicinity of the buyers, could soon determine which were the best kinds for that particular region, so that the most satisfactory selection would be made.

In the discussion which followed this essay, Mr. Albaugh thought that while the theory might be good, it would be found in practice that few florists could give sufficient attention to a retail tree business in addition to their own. One intelligent tree agent would sell more stock than a dozen florists in a county by careful canvassing among individuals who take no interest in flowers, and who care for nothing unless it is forced on their attention and unless they are convinced that there is money in it. Mr. Albaugh had found business men who, for a fair compensation, were willing to devote their entire time to canvassing for the nursery trade, and it was just as legitimate a business as any other. After thirty-six years' experience and trying five or six ways of disposing of his goods, and abandoning one after another, he had at last adopted this one. He employs energetic men, and makes himself responsible for what they do, giving them certificates that bind their principals legally for their acts.

Mr. Harris thought that the plan suggested might answer for the sale of ornamental shrubbery, but it would be of no value in selling fruit-trees. Mr. Hale said, that from what he had learned of florists in getting statistics for the census, nurserymen, in many cases, might do well to unite with them in the dissemination of certain specialties, because, in the first place, this would be simply an addition to the florist's business, and, in the second place, he had found the florists, as a class, unusually enterprising, and the enormous development of their business during the last fifteen or twenty years shows them to be in close touch with the people and the people's wants.

Mr. Hill had no doubt that an intelligent florist would make a good salesman if he could give time and attention to the matter, but the florist who has not enough business in his legitimate line to occupy him at the time when nursery stock should be sold had better retire. The busy seasons of both industries come at once, and a successful florist has all he can possibly do in his legitimate calling at just the time when shrubs and trees should be sold.

Notes.

Three hundred thousand tons of vegetables were brought into the city of Paris last year, and their value reached the amount of $25,000,000.

The bright purple and fragrant flowers of *Clematis crispa* are already opening, and since they will continue to appear until frost this must be considered among the valuable garden-plants which are native to this country. Besides the beautiful solitary flowers, the foliage is very graceful, and the plant, although it is found from North Carolina to Texas, is perfectly hardy in our northern states.

We have received from the Meehan nurseries, Germantown, a spray of *Benthamia Japonica* in bloom, and the flowers closely resemble those of the Flowering Dogwood, although the white satiny bracts are narrower and more sharply pointed. Blooming as it does after the bright green leaves have attained their full size, this is a promising addition to the showy flowering shrubs for the gardens of our northern states.

A German journal states that the "Fragrant Goose-foot" (*Chenopodium ambrosioides*) is the sixty-sixth plant which has been recommended by Mr. John R. Jackson, of Kew, as a substitute for tea and coffee. It is a native of South America, whence it was exported under the name of "Jesuit Tea," but has become naturalized in Mexico and the West Indies, at the

Cape of Good Hope and in certain isolated spots in Europe. The whole plant has a strong, penetrating and notably aromatic odor, and, as it acts temporarily on the nervous system and in subduing cramps, it is useful as a mild medicine and tonic.

The statue of Mr. James S. T. Stranahan, which had been placed near the main entrance of Prospect Park, was unveiled on the 6th of June. It is the work of Mr. W. Frederick M'Monnies, a young artist who was born in Brooklyn and has lived for some years in Paris, and is the gift of the citizens of Brooklyn. Statues to living men are not often erected, but the exceptional honor was, in this case, well deserved, and, of course, it was fitting that Mr. Stranahan's figure should be placed where it would typify the greatest of his many services to his native town—the leading part he played in the establishment of Prospect Park.

A figure is published in the issue of the *Gardeners' Chronicle* of May 3d of a hybrid Sweet-brier Rose, with bright crimson flowers. This interesting plant was raised by Lord Penzance, and was described by him in a paper on the hybridization of species of Rose published in the eleventh volume of the *Journal of the Royal Horticultural Society*. It was raised from the Austrian Brier, fertilized with the pollen of the Sweet-brier, and is said to be intermediate between the two parents, its foliage having the fragrance of the Sweet-brier, while the flower, which is two inches across, is pale crimson, flushed on the under-surface with fawn-colored tints.

Few people know, perhaps, that any article of food is imported into this country from Egypt, but, according to the New York *Tribune*, that country sends us large quantities of onions, as many as 50,000 bushels often arriving in a single week. The onions, which are shipped from Alexandria to Liverpool, and thence to New York, are small and yellow, and not so good as those grown in this country, while they naturally deteriorate somewhat during their long voyage; but they are readily sold, because the price asked in Egypt is so low that, after adding freight charges and a duty of forty cents per bushel, a bag, containing nearly two bushels, is sold here for two dollars or two dollars and a half.

We have received a copy of the "Flora of New Bedford and the Shores of Buzzard's Bay," which is a careful revision of "A Catalogue of Plants found in New Bedford and its Vicinity," published thirty years ago. The author, E. W. Hervey, has made corrections in the nomenclature, and has added to the earlier list of plants such as have since come to his notice. An important part of this work is the "Procession of the Flowers," the object of which is to show the precise time of the year when each plant begins to flower. In this list the more conspicuous of the cultivated trees, shrubs and vines are included, and the dates will be found to answer fairly well for Massachusetts, Rhode Island and Connecticut. Inasmuch as the flowers of the same locality bloom every year with surprising regularity as to time, if we except some variations in the season of early spring flowers, one in search of a particular flower, if informed as to the time of its appearance, does not make a fruitless search by going too early or too late.

The *Vossische Zeitung* recently gave an interesting account of a gardener named Adophe Vard, living at Aubevage, near Gaillon, in Normandy, to whom a decoration had just been awarded by the French Academy. It seems that for thirty years Vard was employed as an oiler at the railway station in Vernon, and devoted himself to gardening only after he had earned the right to retire on a pension. But during many previous years he had spent his leisure hours in self-instruction to such good purpose that, without a teacher, he learned to read Greek and Latin as well as gained an intimate acquaintance with the classic writers of France. Later in life he essayed poetical composition himself. His chief work is a charming story in rhyme, called "Le Rêve de Muguette," in which the taste which turned him toward gardening is clearly evinced. Vard was too poor to publish this work, but the cost was borne by one of his friends, a neighboring inn-keeper; and it is the success of "Le Rêve de Muguette" which has brought him the purple ribbon bestowed for distinguished accomplishment in letters or the arts.

A writer in *Gartenflora* declares that if the present love for Chrysanthemums, which, almost everywhere in the north of Europe, has become almost a craze, ever spreads through the extreme south, it will prove that there is nothing that Dame Fashion cannot accomplish, for, he says, in southern Italy the Chrysanthemum is the "Flower of Death," and is rarely grown except in graveyards, or near by, for the purpose of decorating graves at the feast of All Saints. If it is seen in a garden the place is pretty sure to belong to a foreigner; no native would stick a Chrysanthemum in his button-hole, and the writer doubts whether ladies will ever fill their vases with them, and declares that he has seen an Englishwoman stared at by a wondering crowd in the streets of Naples because she was carrying an armful of these "unlucky death-flowers." At All Saints, however, the cemeteries become perfect "seas of Chrysanthemum-blossoms," other flowers seldom being mingled with them, and they are profusely planted near graves and along the borders of the cemeteries. In no part of Europe, continues the author, could the Chrysanthemum be grown to better advantage than in southern Italy, for it is green all the year round, and blooms from July to January. It often occurs wild, even in good old varieties with double flowers, although these seem to ripen seeds only now and then, and one form is entirely naturalized—a single yellow-flowered form—which grows in a somewhat ragged way, but is well covered with pretty green leaves which retain their freshness even in times of great drought.

On Thursday evening, June 11th, the students of the College of Agriculture of Cornell University held a grand jubilee and banquet to celebrate the prosperity of the college, and in honor of the graduating class, which is the largest in the history of that department of the university. President Adams, of the university, Ex-president White, Hon. O. B. Potter, of New York, and other distinguished guests were present, and made admirable speeches on the history and aims of agricultural education. The elaborate banquet was quite unique, in that everything on the tables, except the sugar and spices, was supplied by the farm and gardens of the department of agriculture. The farm furnished a large variety of breads, meats, and dairy products; the horticultural grounds and forcing-houses, fruits and vegetables; while the conservatories of the botanical department, in addition to a splendid display of decorative plants, supplied some very beautiful specimens of tropical fruits, including bananas, oranges, lemons, and figs. In an adjoining room the various departments of the College of Agriculture had also contributed to a very attractive exhibition of implements, products and appliances for laboratory study. With strong men at the head of all its departments, the College of Agriculture now seems to be entering upon an era of great promise. Several of the highest honors of the university have this year been awarded to students of the college, and work is soon to be commenced upon a new building, which is to be equal to the best of those occupied by other departments of the university.

Walter Baker & Co., of Dorchester, Massachusetts, have issued a handsome volume, entitled "The Chocolate Plant and its Products," in which is given a full and very interesting outline of the early history of the Chocolate-plant, with a sketch of the primitive methods employed in cultivating it and in utilizing the seeds, with an account of the introduction of the beverage into Europe, to which are added a botanical description of the plant and its commercial relations, with microscopic and chemical characters of the seeds as they appear in commerce, an estimate of the value of chocolate as an article of food, with suggestions relative to the cooking of chocolate and cocoa and receipts for using it in different forms. The historical value of the publication is very much enhanced by the introduction of a number of fac-similes of engravings taken from early European works. The first of these, from a rare volume by Bontokoe, shows the Chocolate-plant bearing its large fruit from the main stem and growing under the shade of a larger tree. This is interesting, showing the fact, now generally recognized, that the Chocolate-plant can only be grown successfully in the shade was realized more than three centuries ago. Interesting, too, is the photograph of the flat mortar used by the natives of tropical America for grinding the seeds of the Chocolate. This was done by means of a roller, or short thick stone of cylindrical shape, which could be used with both hands in the same way that the common rolling-pin is used. A fact which will be surprising to most readers certainly is brought out in the history of the Chocolate-plant, that is, that chocolate was used as a beverage in Europe before either tea or coffee was employed anywhere in western Europe. The volume is avowedly an advertisement of the firm whose name appears on the title-page. As an advertisement, however, it is a model of its kind, beautifully printed and illustrated, and full of curious and interesting information which is not accessible to one person in a hundred thousand of those who use the seeds of the Chocolate-tree in some form or other nearly every day of their lives.

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The Bermuda Juniper.

THE principal tree of the Bermuda flora is the Juniper, which covers the islands and makes the conspicuous feature of their vegetation. A few other trees grow naturally on these islands, and several others have been carried to them by man and have now become more or less firmly established. No tree but the Juniper, however, makes much show on the islands, which, from a distance, seem to be completely covered with it.

This Juniper has been growing on Bermuda for a long time. The wood, in the condition of lignite, was found at the depth of fifty feet below low-water mark during the dredging operations undertaken by the British Government in connection with the building of the Bermuda dry-dock. Subsidence of land is slow unless it is the result of some violent catastrophe, like an earthquake, and the fact that this Juniper grew on ground which is now far below the surface of the ocean is conclusive evidence that it has occupied these islands for a period so long that the mind of man, accustomed to measure time by years or by centuries, cannot form a clear notion of its immensity.

How did the Juniper first get to Bermuda? By what process did this tree, which is unlike other trees of its kind, first appear on these minute islands remote from all other land, and raised from the bed of the ocean by the patient toil of insects, long after the neighboring continent had assumed very nearly its present aspect? These are questions which present themselves to the student of nature as he sails into the harbor of Hamilton and sees the low islands about him everywhere clothed with this peculiar tree. It was not a case of separate creation, for the idea of the old philosophers, that plants and animals were created as they now appear in the different parts of the world where they occur, is no longer tenable. Man certainly did not bring the Juniper to Bermuda, for it is not quite four hundred years yet since man first saw these islands; and it is not improbable that trees are still standing which were growing when Juan Bermudez sighted the islands which Oviedo, the first naturalist to write on the New World, and a passenger with Bermudez on his ship "La Garza," described as "the most remote of all the islands yet found in the world."

Fifty years ago these questions would not have been easy to answer. Now the light which Darwin and Hooker and Wallace and other naturalists, working on the lines laid down by Darwin, have thrown on the origin of insular floras makes it easy to find a simple and, probably, a correct solution of the presence of the Juniper on the Bermuda Islands. There is a Juniper in North America growing in nearly all parts of the continent, from Canada to Florida, and from Cape Cod to Vancouver's Island; this is our so-called Red Cedar (*Juniperus Virginiana*), a tree which, in all important respects, is very similar to the Bermuda tree. It is a well-known fact that several of our birds are very fond of the berries of the Red Cedar and devour them in large quantities. To this is due the fact that this tree is so generally scattered and multiplied through the country, as birds void the hard stone-like seeds without injuring their vitality, and so spread them far and wide. There is evidence enough that our Red Cedar was growing on this continent long before Bermuda rose above the surface of the ocean; and a bird, with his crop full of Cedar-berries, may have been blown off from the mainland and found a resting-place on the then barren coral rocks, where the seeds he had brought found conditions which favored their germination. Our continental birds, in several species, now visit Bermuda every year in considerable numbers, and this habit must have had its origin in accident. The Red Cedar once established in Bermuda, it is easy to imagine that the climate and soil conditions of its new environment would gradually change its appearance, just as all plants are gradually modified by the influences of their surroundings; and that in time, after the lapse of countless years, that it would take on its present appearance and stand for what naturalists call a species, that is, a modified or differentiated form of some other form or species. And, after all, the differences which distinguish the continental Juniper from its insular descendant are not very great. The branches of the island tree have grown stouter and tougher through their long struggles against the ocean gales; the roots have learned the secret of holding on to bare rocks or of penetrating deep into their interstices. The foliage has lost its dark green tints and is now a pale blue-gray. The leaves are blunter and are furnished on the back with a gland or resin duct. The fruit is somewhat larger, and the heart-wood is not so bright a red and is rather less fragrant than that of the Red Cedar.

An interesting thing about the Bermuda Cedar is its ability to grow apparently equally well in very different situations. It flourishes on the dry porous limestone-hills and grows as freely on the brackish swamp-lands which occur in some parts of the islands. It is not unusual to find trees of a wide geographical range, and therefore subject to different climatic surroundings, which seek to adapt themselves to them by selecting situations which in one region are at the sea-level and in others are at the top of high mountains. Many conifers which grow at the north at the sea-level are found in the south only at considerable elevations above the ocean; and the Red Cedar itself, which grows at the north on high dry uplands, inhabits, in Florida, swamps which are inundated during a considerable part of the year, and in the dry climate of the western part of the continent occurs only at high elevations. But the Bermuda Cedar grows as well in one place as it does in another, although climatic conditions do not, of course, differ perceptibly in different parts of this small group of islands.

Large individuals are no longer common; the axe of the wood-cutter and the ship-builder long ago swept them away. Here and there a venerable trunk may still be found, but among the large trees still growing on the island

very few probably are much more than a century old or are large enough to possess any great commercial value. Formerly the wood was much used in ship-building; and it is interesting to note that Henry May, an English sailor, who was wrecked on the Bermuda Islands in 1593, and who afterward printed the first account of them, escaped with his companions to the banks of Newfoundland in a vessel which they were able to make from the Cedar-wood. This same wood, twenty-seven years later, furnished the material from which Admiral Sir George Somers, who the year before had been wrecked while in command of the "Sea Adventure" on the islands, constructed the vessel which carried him to the relief of the infant colony of Virginia, and in which his body was afterward borne back to his native land. Beautiful and very lasting furniture, too, was once made on the islands from the Cedar-wood, and old cedar chests and cabinets 200 years old and more are still held as heirlooms by the descendants of some old Bermuda families who still live in houses finished with this wood, which grows with age rich and dark in color like old mahogany.

Two portraits of Bermuda Cedars are printed in this issue. That on page 274 represents the stem of a very old tree standing in the Devonshire churchyard close by the ivy-covered parish church, which resembles in architecture and surroundings one of the little churches of the older Devonshire. The tree, which recalls one of those venerable Yews of England, hoary with age, and familiar inhabitants of many an English churchyard, probably led to the selection of this particular spot as a place of worship. The tree must have been a very old and large one when the little church was built; it may well have been standing when human eyes rested on these islands for the first time, and probably it has changed very little in the last 200 years. The diameter of the trunk is now fifty-nine inches, and the height of the tree is some forty feet. Only two larger specimens are now known to exist.

The second view represents the tree as it grows in the moist black soil of the Devonshire marshes, a large tract of ground covered with Cedars of large size and springing from a dense undergrowth of Wax Myrtle, or Myrica, identical with the species so common on our Atlantic sea-board, and of Baccharis, similar to, although distinct from, our sea-board species. Tall specimens of the Bermuda Palm which, next to the Juniper, is the most interesting plant of the islands, appear here and there among the Cedars, and the ground beneath the shrubs is covered with a luxuriant growth of Ferns—with the Bracken (*Pteris aquilina*) with fronds four or five feet tall, with numerous clusters of the great Marsh Fern (*Acrosticum aureum*), and with the rare and local Devonshire Marsh Fern (*Aspidium Capense*). These marshes and their inhabitants are very beautiful, more beautiful, certainly, than any other part of the islands, and as the sunlight plays through their open glades on the pale trunks of the great trees, they offer contrasts of color and afford effects of light and shade which our picture does not convey and which words cannot paint.

The Lynn Public Forest.

AN interesting sketch, published in a recent issue of the *Lynn Transcript*, contains much information relating to the early traditions and uses of the public woods which now form a unique pleasure-ground to that city. One of the things which surprise people visiting the Lynn woods for the first time is the rude stone walls which cross them from Wyoma and Saugus, extending in straight lines for many miles through swamps and over hills. They were built by the Puritan founders of Lynn to protect the live stock of the young settlement. To properly understand the motives which induced the great expenditure of time and labor needed in constructing these walls one must consider "the admirable economic system of land tenure which shaped the early towns. The church was the nucleus about which the planters grouped their dwellings. That the houses might be within a convenient distance from the church and from each other, and, at the same time, to foster that spirit of loyalty and independence which springs from the ownership of the soil, the Puritans threw away utterly the last traces of feudal holding of lands for services, and distributed home-lots in fee-simple. The Pilgrims at Plymouth tried at first a pure community of lands and of goods; the Puritans of Massachusetts Bay made no such mistake. They decreed every man's house as his castle in a truer sense than Englishmen had known in the Old World. Thus they established convenience to attend church and nearness to each other for safety, and the home became a sacred holding. The Puritans, however, tried the experiment of herding the stock of individuals upon commons held by the towns. This custom grew out of the Puritan reverence for that other chosen people—the children of Israel. Herding in common, but retaining individual ownership in the stock, besides being a labor-saving device, made the settlers neighborly. The early colonial ordinances teem with regulations concerning cattle, corn-fields, fences, tolling and banding of cattle, trespass by cattle and swine, damage to cattle by wolves. Cow-herds and shepherds and swine-herds became classes."

The long walls were built by the common labor of the men for the protection of their stock. The cow-pastures were nearest to the settlements because the cows had to be driven home twice every day to be milked. The horses were carefully watched, and the General Court as early as 1668 passed an ordinance directing the selectmen of towns to attend to their improvement. The Lynn horse-pasture was north of the present Pine Grove Cemetery, and was well watered by a never-failing spring, which flows as freely to-day as it did two hundred and fifty years ago. The pasture used by the early settlers for their oxen was beyond what is now Glen Louis Pond. Being farthest from the settlement, it was exposed to the ravages of wolves, which abounded in those days, and necessitated the construction of the wolf-pits, which still remain, a striking example to the ingenuity of the early settlers. The Puritans' dread of wolves was only second to their fear of witches, and in 1645 the General Court passed a law by which it was provided that the sum of ten shillings should be paid out of the county treasury "to any person, English or Indian, who shall kill a wolf within ten miles of any plantation."

The writer in the *Lynn Transcript* points out that the "Lynn woods have had three periods of usefulness. Down to 1706 they furnished pasturage and timber and shelter to the village. In their second period, covering the life of the town shifting from the pastoral to mechanical pursuits, they were still useful, although restricted to furnishing fuel to the inhabitants. As time went on, and cheap coal came in with the ever-advancing density of population, it seemed as if the slaughtering brick-maker and the fire-fiend would render the woods a desolation, a desert and a menace to our fair town."

But a period of greater usefulness has come. The inhabitants of cities require pure water, and the people of Lynn have wisely determined to protect and preserve the abundant supply which still flows from the springs which watered the cattle of the Puritans, and these woods now perform their noblest duty in furnishing the great city with water, oxygen and sylvan beauty for the repose of its inhabitants.

"The fathers, with their Aryan ways, their patient oxen and their demon wolves, have gone; the woods which were used first in common, then in severalty, the walls which testified to their energy, and the wolf-pits which note their skill in masonry, are being restored to the common inheritance of their children's children."

Bristol Pond Bog.

TO most people the word bog does not suggest anything very inviting. On the contrary, it is considered nothing but a miry piece of ground where no one would venture, unless obliged to, and where nothing attractive can be found. This is, no doubt, a correct impression of some bogs, but we have, in New England, bogs and swamps that are as attractive, at certain seasons, in their display of natural scenery as any of the mountain forests.

In the town of Bristol, Vermont, is what is called Bristol Pond, a small sheet of water fed by mountain brooks and springs, and from which flows a lively little creek. The pond is almost surrounded by bog lands, of which there are several hundred acres, and on the east side, bordering the bog, is Hog's Back, a large foot-hill of the Green Mountains, which extends north and south for a distance of about nine miles. The pond is about a mile long by a third or half as wide, varying, of course, at different points, and very irregular in outline. The depth of the water varies from a few inches to six or ten feet, but under this lies an unfathomed body of thin, soft, peaty mud, about as thick as porridge at its surface, but probably

thicker at lower depths. The water is quite clear when not disturbed by winds, but there is a constant bubbling in warm weather from the escaping gases of the mud.

Water-lilies flourish here in the little bays, where severe winds do not disturb them; and around the margin, where the bog often projects out over the water, may be seen fine large clumps of the Swamp Loosetrife (*Nesæa verticillata*), its gracefully drooping branches resting and rooting on the surface of the water. Not only are the rose-purple flowers of this plant attractive, but its leafy recurving stems are pretty the whole season, and, for artificial bogs or the margins of ponds and streams, planted in a peaty soil, it has no substitute. Here also may be seen, flowering in its season, the Swamp or Water Rose (*Rosa Carolina*), which grows in such localities, with various other water-loving shrubs. For quite a distance back from the margin of the pond is an open bog upon which few or no trees grow, but there are low shrubs on a part of it, while other portions have only Rushes, Sedges, Pitcher-plants, and Cotton Grass. Of the latter there are three or four species. The Twig Rush (*Cladium mariscoides*) is everywhere on this open bog, and one or two species of the Beak Rush (Rhynchospora). *Dulichium spathaceum*, another queer and striking bog Sedge, also abounds, as well as other small plants that would interest the botanist. Not far back from the margin of the pond are clumps of Arrow Arum (*Peltandra Virginica*), and, scattered all over this open space, as well as back among the timbered portions of the bog, grows very abundantly the Side-saddle Flower, or Pitcher-plant (*Sarracenia purpurea*), of which the specimens here, in the full sunlight, have beautifully variegated and colored leaves, and much darker purple flowers than those in the shade. Acres of this plant in full bloom make an attractive scene. Going back from the margin of the pond upon the open bog we find, on slightly elevated portions, now and then clumps of trees—low Tamarack, Spruce and Arbor-vitæ; and clustered about them, as if planted there for a purpose, are such shrubs as the Chokeberry (*Pyrus nigra*), Swamp Fly Honeysuckle (*Lonicera oblongifolia*), Mountain Holly (*Nemopanthes Canadensis*), the Myrtle and Hoary Willows (*Salix myrtiloides* and *S. candida*), Sweet Gale (*Myrica Gale*) and many more. Sphagnum Moss, which is not found on the wetter portions of the bog, usually grows about these trees and shrubs, and in it are such low shrubby plants as the Leather Leaf (*Cassandra calyculata*), *Andromeda polifolia* and the Pale Laurel (*Kalmia glauca*). The small Moss Cranberry (*Vaccinium Oxycoccus*) often forms, with the Sphagnum, a pretty carpet, and when covered with its abundant small white or pale pink flowers in early summer, or in autumn with its speckled fruit, is very attractive. The Large or American Cranberry (*V. macrocarpon*), though it grows here also, is nowhere so abundant. The Creeping Snowberry (*Chiogenes hispidula*), where it can find a little shade, is also abundant, and forms thick mats of its creeping stems and small dark evergreen leaves. Large overgrown clumps of the Stemless Lady's-slipper (*Cypripedium acaule*) are sometimes found here growing in the Sphagnum.

As we go farther back into the timbered portion we come among more Tamarack, Arbor-vitæ and Spruce, so that, though they do not completely cover the bog, they have hidden the pond from our view. Here in the half-open spaces, where the ground is higher, and is completely covered with moss, may be found in their seasons a wealth of flowers. *Arethusa bulbosa* is so abundant in certain localities that one might sit in the soft moss and gather a score of plants without moving. It varies in height from the little dwarf which rises an inch or two above the moss to the strong plants fifteen or twenty inches high. The Bog Shinleaf (*Pyrola rotundifolia*, var. *uliginosa*), which grows and blooms with the Arethusa, is a charming companion to it, has roundish shiny leaves and handsome purple or flesh-colored flowers. The Sarracenia and Stemless Lady's-slipper are also here, and one of the white-flowered Rein Orchis (*Habenaria dilatata*), with handsome spikes of fragrant pearly white flowers. *Calopogon pulchellus* is scattered about everywhere, as is also, though not quite so abundant, *Pogonia ophioglossoides*. Other less showy Orchids are growing in scattered groups not far away, such as *Habenaria hyperborea*, *H. tridenta*, *Listera cordata* and *Microstylis ophioglossoides*. The Bog Bean (*Menyanthes trifoliata*) is quite common in places, and the handsome racemes of its dainty white flowers are among the earliest of the bog. *Smilacina stellata* and *S. trifolia* are both common here, and add much to the floral display. The little Ram's-head Lady's-slipper (*Cypripedium arietinum*) also grows a little farther back in more favored situations; and in other places the small yellow Lady's-slipper (*Cypripedium parviflorum*) is quite abundant, and not rarely in clumps of a dozen stalks. At each step we sink ankle-deep in the cool soft Sphagnum, and as we turn back and see our footprints they reproach us as if we had ventured on sacred ground.

Walking at random, and with no definite course, through this botanical paradise, new attractions greet us at every turn. Farther back out of the locality of Sphagnum we find large patches of the Twin-flower (*Linnæa borealis*), which is one of our most attractive little vines when in flower. The Water Arum, or Wild Calla (*Calla palustris*), is also found here, and, though not abundant, the showy Lady's-slipper (*Cypripedium spectabile*) is frequently seen. Under some of the large thick clumps of Arbor-vitæ, where only a thin sifting of sunlight ever reaches it, is one of our most delicate and charming little Orchids, *Orchis rotundifolia*, with pale rose-purple flowers. Even the *Calypso borealis* is not a stranger to this bog, for it has been found here in the drier portions under the largest specimens of Arbor-vitæ. Around some portions of the bog's margin the Black Ash extends into the bog or peaty ground for some distance. Other portions are thickly covered with low trees or tall shrubs. Still others have such a dense growth of Arbor-vitæ that nothing can live under them. But in some places, where the evergreens are scattered with wide spaces of Sphagnum Moss between, may be found some sylvan scenes as rich as any our forests afford.

Botanical Garden, St. Louis, Mo. *F. H. Horsford.*

How We Renewed an Old Place.

X.—A STRUGGLE WITH THE WEB-WORM.

AMONG the difficulties of reclaiming a place, one cannot ignore the necessary hand-to-hand conflict with the various animal and vegetable enemies which lie in wait to destroy plants and trees. Eternal vigilance is the price of vegetation as well as of liberty, and the cultivator who dreams that he can for a moment take his ease in his inn, reckons without his guests of the insect-world, who take short naps, and require as much nourishment as Falstaff. I shall have more to say upon this subject at a later date, but I am now fresh from a conflict with the Web-worm, and find a treatise upon his manners and customs apropos. As an example of pertinacity, Bruce's spider beside him pales her ineffectual fires; as an evidence of the apathetic stupidity of man he is unrivaled, and as a menace of future untold horrors he may well be used to point a moral of grewsome interest.

Some philosopher has said that "the real end of the world will come when man ceases to be able to cope with the insects." When his time comes the worm is the master of us all, but there is no reason while we are yet stirring about this earthly ball that we need submit to be devoured by him before our day. And yet, when you come to think of it, that is what the brute is after. Too cowardly to attack man openly, he begins by eating up his provender. Man, being on the whole an easy-going animal, at first pays not much attention; but he only multiplies moderately, and the insect enormously. Where a man will leave a half-dozen descendants in a life-time a worm will leave one hundred and twenty-five thousand in a season; judge then if this can be allowed to go on indefinitely and man survive!

Where the inane apathy of the human being comes in is in not crushing his enemy while yet insignificant; forever penny wise and pound foolish, man tolerates a moderate evil until it becomes inordinate, and then wastes a fortune which might well have been saved, in doing ineffectual battle with his foe. It is the fable of Epimetheus forever renewed, and the appeal I would now make is to have this Pandora's box closed before the rest of the Web-worms escape to plague the world, and help make an end of the race.

It is idle to scoff at this idea as that of an alarmist. A few years ago the spring Web-worm was an unimportant factor in our orchards. The fall worm gave some trouble, but he was not impossible to cope with. Now, not only do we have to fight for every apple we possess in the autumn, but all through the months of April and May, when work presses, when every moment is precious, it takes not only all the hands on a farm to fight caterpillars, but also all the eyes of the family to detect their lurking-places; and this not as one job, but as a perpetually recurring duty for weeks at a time, and all on account of the crying neglect by land-owners of their premises, and by town authorities of the webs on their own highways, which have been allowed to accumulate, until the country roads have lost their beauty, lined as they are with trees shrouded from root to summit in ghostly webs, under which myriads of loathsome black worms writhe and crawl, and eat their fill, to the shuddering disgust of the wayfarer.

Far and near, not only are the wild Cherry-trees, already infested with the odious black knot, left to spread a second plague among the fruit-trees, but whole orchards are allowed to bear, unmolested, swarms of caterpillars, their owners preferring to sacrifice their apples rather than take the trouble to clean their trees of the webs.

If the state of Massachusetts has taken the Gypsy Moth in hand, why should not communities take charge of their own worms and enforce the destruction of the webs by each landowner, under penalty of a fine, while the street commissioners be made to attend to the trees bordering the highway?

The farmers who neglect this rapidly increasing nuisance seem to me like the Turk who sits under a crumbling wall, murmuring, "God is great! if it falls it falls!" and takes no pains to get out of the way.

So far as our own little farm is concerned, some tall wild Cherry-trees that we depend on for a screen give us timely notice of the arrival of the pest, and bring us all out promptly to do battle. The worms are fought with fire on the end of a pole, with a tall clipping knife, and with a wire brush attached to the end of a long bamboo rod which reaches to the very top of the tallest trees, where, being judiciously twisted, it brings down a crop of crawlers for more positive destruction below. The clipping is the most thorough method, for, if done late in the evening, the nest, with all its occupants, can be secured and its contents burned or trampled to death. In this way all the insects can be destroyed, but, of course, it is only possible where the web is on the end of a small branch. Where it lies in the great crotches the torch or the wire brush must be applied, but the former lets some escape, and I am told that when the nests are burned, the fire shrivels the outside of the crawling mass, which falls with the web to the ground, but the caterpillars in the heart of the living ball escape, to crawl up the tree again and start afresh upon their depredations.

It is of no use to think that you have accomplished your purpose because, after heroic labor, there seems not a vestige of a nest remaining. No sooner do you feel that you have routed the last encampment of the enemy than, presto, his tents are once more like those of the Assyrian for multitude, and in a day or two you must resume your round to find the enemy bigger and brisker than ever. About three months of the season have to be given up to the two campaigns, spring and fall, till finally a person of imagination begins to feel that the philosopher's prediction is about to be fulfilled, and that the worm has come to stay.

"Of what use are the Cherry-trees?" say the wise; "the worm, after all, is not so bad as the black knot, and compared to the canker-worm he is harmless"; but the terror of his multiplication is upon me, and I live in fear of the day when, having ruined all the fruit-trees, and having failed to find the shade-trees to his liking, the worm may take a fancy to investigate within-doors to find a more tempting meal.

A vision of opening the front door in the morning to find the house encased in an enormous web, under which the worms are feeding on the shingles, and glaring at you from under their silken canopy, besets the imagination. You seize your hat, a brisk young family drops out of it; your coat—there are a score of creeping things inside the sleeves. The breakfast-table is invaded by a squirming throng; others hang from the draperies and wander across the ceilings. Why may not the Web-worms become as great a pest to us as the Termites prove to the South African, if the apathetic public does not awake in time to the necessity of destroying them while they are yet in the minority?

Here in this town, where the neglect of certain farmers adds so greatly to the labors of their more thrifty neighbors, we have seen these loathsome creatures multiply in a few years to an alarming extent, and it seems as if the time had come to render it a penal offense to neglect to destroy the webs as fast as they appear. Unquestionably, the day is coming when some destructive measures will have to be adopted, and the sooner the matter is taken in hand the easier it will be for all concerned to get rid of the evil, and I should be glad if some more powerful pen than mine could be used to hurry this good end.

An evil, trifling in itself, becomes a menace if neglected, and the comparatively inoffensive character of this little brute seems to blind the public to the way in which he is multiplying. A committee to find out how much harm he does might serve as a preliminary to more strenuous measures, but if it were only in the interest of those lovely rustic roads, in which Garden and Forest takes so much delight, it would be worth while to clear away so obtrusive an eyesore as these loathsome webs from the way-sides, otherwise so beautiful with their wild vines and tangle of bushes.

Moreover, for the pedestrian the multiplication of caterpillars is a distress yearly more and more appalling. After the worm has eaten his fill he sets forth upon his peregrinations, to find a sheltered spot where he can become a hermit in a cell, until such time as his resurrection as a moth is in order, and you are obliged to meet him on his winding way at every turn in your path. Country sidewalks swarm with the wretches; verandas are their especial delight; you gather a flower, a caterpillar is crawling up the stem; examine your trees of all sorts, the brutes are making of their trunks a public promenade, up which they hurry at top speed to make a cocoon in the branches; would you rest yourself upon a bench, the caterpillar is there before you; if you wear a thin gown, you may have the pleasure of viewing through its meshes the wriggling, hairy form of your enemy, just where you cannot get at him. He makes himself at home amid the flowers of your bonnet, he swings down upon a silken thread within an inch of your nose. He arouses in the gentlest breast a desire to slay this future parent of thousands; he undermines the character by stirring up sentiments of virulent hostility in otherwise peaceable souls; he becomes a menace not only to existence, but to Christian character, by developing the savage instincts of our nature; and, therefore, on every ground, both physical and moral, he is an enemy of the public peace who should be taken in hand by the authorities and be doomed to extermination.

Hingham, Mass. *M. C. Robbins.*

Note.—The editor of this periodical requests me to provide my enemy with a more precise name than Web-worm. Not being learned in entomology, the only term I dare to vouch for is *Nasticrechia Krorluppia* (to be pronounced English fashion).

To this family I am entirely sure he belongs, but one of the reports of the Department of Agriculture has a good deal to say about a certain *Hyphantria cunea*, which seems to correspond to him in most particulars, and the same report furnishes for him ten more synonymous names that apparently can be used if necessary. From this abundance I have selected the above as the most euphonious and descriptive, for nothing could be more appropriate than the term Shameless Weaver, which, I am told, is the translation of these polysyllables. Should my particular Web-worm require a more formal introduction to the public, it is to be hoped that some entomologist will kindly supply us with his real designation.

New or Little-known Plants.

New Orchids.

Cirrhopetalum elegantulum, Rolfe, is an elegant and floriferous little species, native of the Coorg Hills, south India, which was sent to Kew by Mr. J. O'Brien, of Harrow. It is allied to *C. pumilio*, Hook., f., a native of Burma. The lateral sepals are yellow, except in their basal portion, which, like the rest of the flower, is striped with maroon-purple on a pale ground.—*Gardeners' Chronicle*, May 2d, p. 332.

Masdevallia × falcata, O'Brien, is a showy garden-hybrid raised by Mr. D. O. Drewett, of Riding Mill-on-Tyne, from *M. Lindeni*, crossed with the pollen of *M. Veitchii*, to which latter it bears a considerable resemblance, especially in color. It may be compared to *M.* × *Chelsoni* in its general characters.—*Gardeners' Chronicle*, May 2d, p. 332.

Epidendrum × dellense, O'Brien, is a pretty hybrid raised in the celebrated collection of Baron Schröder, of The Dell, Egham, between *E. xanthinum* and *E. radicans*, the latter being the pollen parent. It bears a considerable resemblance to the mother plant, except in color, which is a shade of orange approaching vermilion. The flowers, however, are larger, and there is a slight curvature in the column which bespeaks the influence of *E. radicans*.—*Gardeners' Chronicle*, May 9th, p. 584.

Sobralia macrantha delicata, O'Brien, is a pale, nearly white, variety, with a tinge of lavender on the sepals and petals, and lilac on the margin of the lip, and without any yellow on the throat. It flowered with F. A. Bevan, Esq., of New Barnet, from an importation of Messrs. F. Sander & Co., of St. Albans.—*Gardeners' Chronicle*, May 9th, p. 585.

Cirrhopetalum Wendlandianum, Kränzlin, is a remarkable species, native of British Burma, which flowered in the collection of Herr Wendland, of Herrenhausen, near Hanover. It bears an umbel of three to six flowers, colored in the way of the old *C. auratum*. The sepals are ovate, with long hairs on the margin, and with five or six fluttering serrulate leaflets at the top, almost as long as the sepals, and deep

claret-red in color. The petals are ovate at the base, protracted into tails from six to seven inches in length, longer than the pedicel itself. They are yellow, striped with purple in color, as also are the sepals, while the lip and column are purplish, with deep red spots. It is a very remarkable species.—*Gardeners' Chronicle*, May 16th, p. 612.

Cirrhopetalum Collettii, Hemsley, is a beautiful species, originally described from dried specimens, but now flowering, for the first time in Europe, in the Kew collection. It is nearly allied to *C. ornatissimum*, but has larger flowers, and is probably the finest species in the genus. It grows on the Shan Hills, in eastern Burma, at an altitude of 6,000 feet. The flowers are striped with reddish purple on a lighter ground. The upper sepal is adorned with numerous linear appendages on the margin, and the apex of the petals with several slender leaf-like bodies, which flutter in a singular manner with the slightest breath of wind, and probably serve to attract insects for the fertilization of the flowers.—*Gardeners' Chronicle*, May 16th, p. 614.

Kew. *R. A. Rolfe.*

Foreign Correspondence.

Some New Plants in England.

Primula Poissoni, Franchet.—This is a beautiful plant, for which we are indebted in the first instance to L'Abbé Delavay, who discovered it along with many other good garden-plants in Yun-nan, and forwarded seeds to the Jardin des Plantes, Paris, to which establishment we are indebted for several of the seedlings which are now in flower at Kew. In stature and general appearance *P. Poissoni* is similar to the popular *P. Japonica*, but it differs from that species in the smaller, more fleshy, glaucous, smooth character of its foliage, and in the color and several minor details of its flowers. The plant forms a dense tuft of leaves, each of which is six inches long by from one and a half to two inches wide, and the scape is erect, stout, as in *P. Japonica*, with the flowers in whorls and opening in succession. Each flower is as large as those of the best forms of *P. Japonica*, and colored bright rosy mauve, with a conspicuous eye-like ring of yellow around the apex of the tube of the corolla. The segments are obovate and notched, and in the Kew plants every flower has either six or seven segments. A description of this species occurs along with others in the *Bulletin de la Société Botanique de France* for 1887, which contains a paper by Franchet on the Primulas of China and Tibet.

P. imperialis, Jungh.—This is the giant Primrose of the high mountains of Java, which De Vriese described as a new genus under the name of *Cankrienia chrysantha*, and which Wallace mentions in his delightful book, "The Malay Archipelago."

In 1884 Sir Joseph Hooker referred this plant to the Himalayan *P. prolifera*, a smaller, and in every way much inferior, plant from the point of view of the horticulturist. The two may be specifically identical, but there is a great difference between the Himalayan form as represented in the *Botanical Magazine*, t. 6732, and the Javanese giant as represented by a batch of plants now in bloom in a cold frame at Kew. Picture a plant like *P. Japonica* in habit, but with leaves fifteen inches long by five inches in width, and a scape as thick as a man's little finger, bearing whorls of deep yellow flowers almost as large as those of *P. Japonica*. The scapes on the Kew plants are already two feet high, although only the first whorl of flowers has expanded, and there are five or six to come in all. As the largest Primula known, this species, or rather the Java form, has a special interest, but it also possesses beauty in its deep yellow flowers, while looking at it as the probable progenitor of a race of garden-plants—for it may be considered to have all the capabilities of its ally, *P. Japonica*—it must have a decided value for the breeder and cultivator. It has crossed freely with *P. Japonica;* at any rate, there are some plump, promising-looking pods of hybrid seeds on some plants at Kew.

The following plants were among those which obtained certificates at the exhibition held in the Temple Gardens last week:

Eremurus Himalaicus.—Several flower-spikes of this plant were exhibited from a garden in Ireland, where apparently these stately Indian Asphodels find congenial quarters. Mr. Gumbleton, of Cork, I believe, was the first to flower the above-named species, having raised it from seeds collected in the Punjaub, where it is said to produce flower-spikes eight feet high. Mr. Gumbleton's plants were five feet high. How high those exhibited had been I could not ascertain, but only the flower-bearing portion of the spike was sent, and this was exceedingly beautiful, being a compact tall pyramid, two feet high, of pure white flowers with golden stamens. The cultivation of these plants requires some care. They prefer a well-drained soil and a sunny position. The crowns, too, should stand a few inches above the level ground. *E. robustus* is another tall and handsome species which is sometimes to be seen in English gardens.

Cocos Pynærti.—This is a seedling variety of *C. Weddelliana* which came up among a batch of seedlings of the latter in the nursery of Monsieur Pynaert Van Gurt, of Ghent, after whom it has been named by Mr. Sander, who obtained a first-class certificate for it from the Royal Horticultural Society. A figure and description of it will be found in *Revue de l'Horticulture Belge* for April last (p. 91), where it is named *C. minima pulchra*, a name, by the way, so far accepted as to have obtained the notice and certificate of the Horticultural Society of Ghent. The plant is very elegant, owing to the narrowness of the pinnæ, which are scarcely half as wide as those of the ordinary *C. Weddelliana*. The Sanderian specimen is unique, so far as I can learn, and, as the plant cannot be propagated, it must necessarily remain so.

Grammatophyllum Measuresianum.—This was the most interesting Orchid at the exhibition. It was introduced from the Philippines by Mr. Sander about two years ago, and distributed under the above provisional name. A description of it will be found in Garden and Forest (ii., 524). The first plant to bloom was that exhibited by Mr. Sander, and, as a matter of course, it was awarded a first-class certificate. Whether it differs from *G. Fenzlianum* or not I am not at present able to decide; but, whatever its correct name may be, it must take rank among the best of tropical garden Orchids. Apparently, it has the same shy flowering character which is the only drawback to the popularity of the other two species in cultivation, namely, *G. Ellisii* and *G. speciosum*. The plant certificated was a grand mass, bearing four erect spikes about five feet long, branched and clothed with numerous flowers, each three inches across; the sepals and petals equal, wavy, half an inch wide, spreading, the tips recurved; lip small, with the sides overlapping and enfolding the column, the tip of which was revealed by the bending down of the tongue-like middle lobe. The color of the whole flower was greenish yellow spotted with reddish brown, the central lobe of the lip being white lined with crimson, the lateral lobes lined with brown.

Cattleya Prince of Wales.—This is a new hybrid raised by Mr. Sander from *C. Mossiæ*, var. and *C. elegans*, or some such combination. It is in the way of the last named, but smaller, with waxy-white sepals and petals, the lips also white, with rosy veins and a wavy margin.

C. Lowryana, from the last-named exhibitor, is supposed to be the result of crossing *C. intermedia* and *C. Forbesii*. It resembles the former in the size and shape of its flowers, which are white, with a purple or mauve tint on the front lobe of the labellum.

Masdevallia Mundyana is the handsomest hybrid Masdevallia hitherto raised. It is the result of crossing *M. Veitchii* and *Mignea aurantiaca*, combining the chief characteristics of the two in a peculiarly pleasing manner. The flowers are almost as large as those of *M. Veitchii*, their color being orange, changing to scarlet toward the lower part of the sepals. It obtained a first-class certificate.

Ærides Savageanum, as shown in several of the groups, was quite worthy of the first-class certificate awarded it. There are, however, many plants of it in cultivation which are a long way inferior, in the size and color of the flowers, to those shown. Mr. Sander thinks this species has not yet been seen at its best. It has elegant loose racemes of rather small but bright crimson-colored flowers.

Oncidium loxense.—This distinct and noble species was named by Lindley about forty years ago from a specimen collected by Hartweg on the Cordillera, near Loxa, in Peru, where it is said to produce "flower-panicles nine feet long, the flowers as in *O. falcipetalum*." In 1884 Reichenbach notices it in the *Gardeners' Chronicle*, in consequence of Mr. Sander having forwarded to him specimens and a drawing, but living flowers of it do not appear to have been seen in England until they were shown on a plant at the Temple last week. This plant has oblong compressed pseudo-bulbs, broad, somewhat rigid, leaves, and a spike five feet long bearing numerous flowers as large as those of *O. macranthum*, but differing from all other plants of the Microchila section in the size and form of its labellum, which resembles the lip of the African *Lissochilus Krebsii* in form and color. The sepals and petals are brown, with irregular blotches of yellowish green, and the lip is deep yellow. A batch of plants of this species was sold by auction in London in 1884.

Fig. 51.—Old Cedar in Devonshire Churchyard, Bermuda.—See page 289.

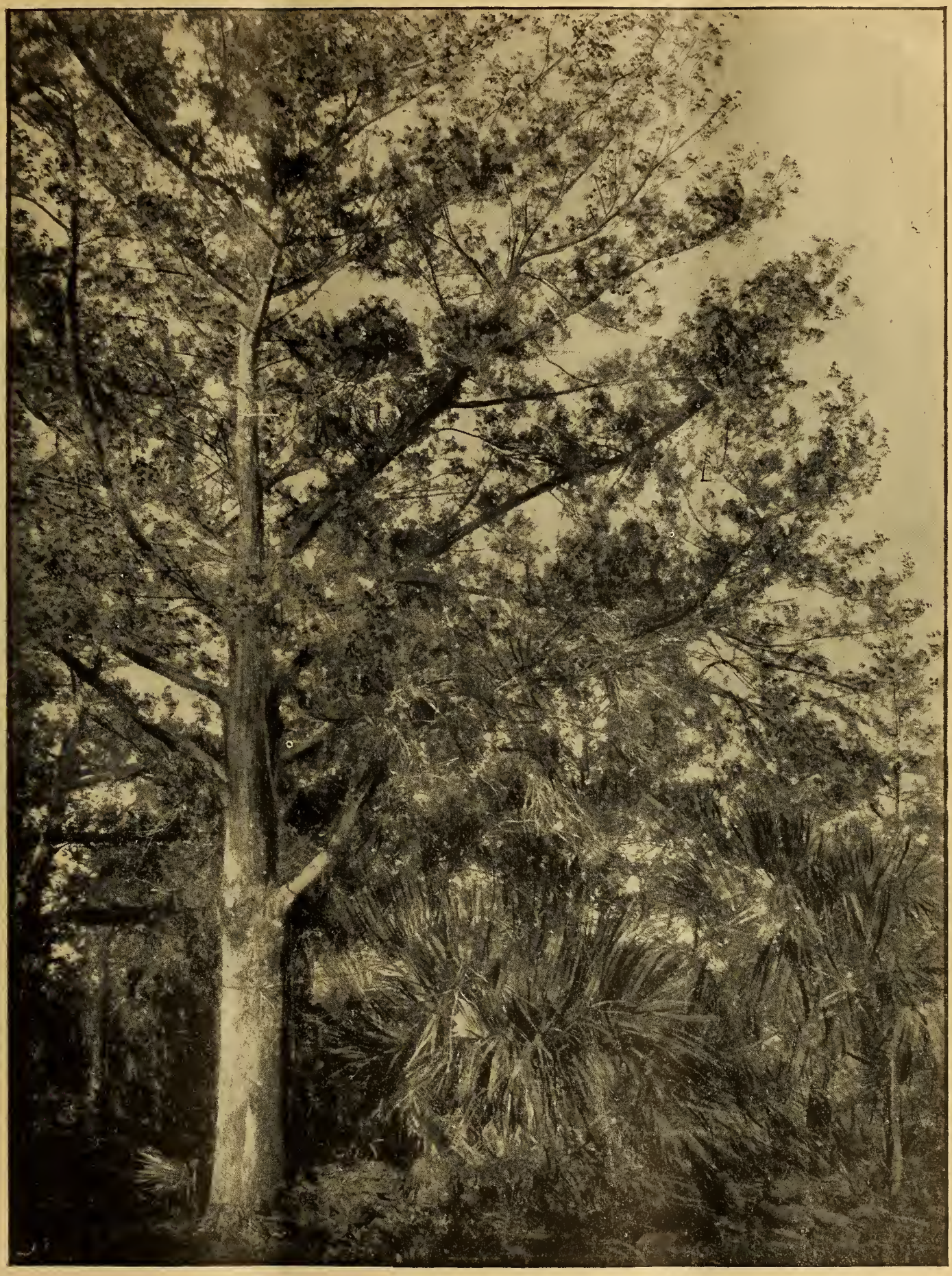

Fig. 52.—Juniperus Bermudiana in the Devonshire Marshes, Bermuda.—See page 289.

Other Orchids which were especially recognized by the Society were *Lælia elegans Statteriana*, white, with a large labellum veined with crimson, on a creamy-white ground; *Cypripedium Stonei magnificum; Dendrobium Parishii albens*, a variety with pale lilac flowers; *Masdevallia Harryana luteo-oculata*, large richly colored flowers with a distinct yellow eye; *Odontoglossum elegans Sanderæ*, which is a most beautifully and heavily marked variety of one of the very finest Odontoglossums; *O. Amesianum;* and several hybrid Cypripediums.

Kew. *W. Watson.*

Cultural Department.

Stray Notes from the Arnold Arboretum.

MANY of the plants which will be mentioned in these notes have already been noticed in the columns of Garden and Forest, and several of them have been figured and described in detail. A longer test in this severe climate, however, brings out the good qualities and emphasizes the value of plants known in cultivation for a few years only or shows their weaknesses or bad qualities, and a few additional facts relating to them may be useful to planters.

Too much cannot be said, certainly, in praise of the native shrubs of eastern America for the decoration of the gardens and shrubberies of the region which they inhabit naturally. Our native Viburnums and Cornels are all plants of beauty and value. The natural shrubberies made several years ago in the Arboretum with these plants show their beauty and value where shrub-planting on a large scale is desirable. Many of the species are not less valuable as single specimens than when grouped in broad masses on the borders of natural woods or of wood-drives. The example set by the Arboretum in utilizing our native plants and in developing their beauties is beginning to bear good fruit, and there is now a demand for plants of this class which none of the nurserymen are enterprising enough to be able to fill at all satisfactorily. There is no difficulty, however, in getting up a stock of any of our native plants; they can, of course, all be raised from seed, and the seed is not difficult to procure in large quantities if any one knowing the plants will take the trouble to go out into the woods and gather it. Young seedling plants, too, can generally be found in abundance in the woods, and, with proper care, these can soon be grown into good specimens. But people do not always take proper care in such cases; and purchasers are apt to think that because plants grow naturally in the woods that they ought not to cost anything but the trouble of digging them. The result has been that nurserymen who have attempted to fill large orders for these plants have generally been forced to offer them at prices which do not allow them to supply proper plants.

The only way to be sure of succeeding with shrubs or trees dug from the woods is to select only small thrifty specimens—those which are only a few inches high are the best—then to plant them in nursery rows in good soil and to cultivate them for one and perhaps for two years. Plants treated in this way become stout and stocky and are supplied with abundant roots, and, transplanted to their permanent places, are certain to succeed and to grow rapidly as soon as transplanted. Such plants are worth at least four times as much money as the native plants usually sold and planted. These are generally dug in the autumn, the largest plants possible being selected, so as to make a good show and satisfy the purchaser who habitually wants "something big to make a show at once, as life is too short to plant little sticks"; the plants are then roughly heeled-in over winter and delivered in the spring with scanty roots and big tops, and usually more dead than alive. Of course, more than three-quarters of such plants die, and the purchaser is discouraged and believes that it is no use trying to make wild plants grow, and goes back to the conventional nursery-grown Golden Spiræas and Golden Elders, purple-leaved Plums, and all the other so-called novelties with which the tree-peddler beguiles the unwary. It costs just as much money and labor to prepare the ground for a bad plant as it does for a good one, and just as much to plant it. It is wretched economy, therefore, to plant cheap trees or cheap shrubs; they need not be large—generally the smaller they are when planted the better—but they should be provided with an abundant supply of active healthy roots. Good soil and good cultivation are needed to produce good roots and make plants which can be transplanted without risk of loss.

But to return to our native Viburnums and Cornels. The largest of the Viburnums, which grow in New England, and one of the handsomest of the whole genus, is the so-called Sheep-berry (*Viburnum Lentago*). This sometimes attains the size of a small tree, but is more often only a shrub. If it is planted by itself in good soil as a specimen on the lawn it will grow into a large round bush perhaps fifteen feet high and ten or fifteen feet through the branches, which will rest on the grass. The leaves are large and beautifully shining and lustrous, and the large flat clusters of small creamy white flowers are produced during the first days of June in the greatest profusion, and in autumn are followed by bunches of handsome blue-black oblong edible fruit. A well-grown and symmetrical specimen of this plant is an object of great beauty; there is hardly another shrub which can be grown into a more perfect specimen; and if the Sheep-berry came from Tibet or Yun-nan, or from the summit of an equatorial African mountain, and cost fifty pounds an inch, rich Americans would soon exhaust the supply. Now the sight of it only fills most people with surprise and a profound disbelief that such a handsome plant can grow by the roadsides and in the coppices of every New England village, for it is this species which is the chief ornament of our roadsides in early summer. *Viburnum Lentago* has been largely planted in the Arboretum, and has proved valuable in all the situations where it has been tried. It flourishes in the shade and in the full sunlight, and requires strong, rich soil and abundant space if it is to be allowed to spread to its full dimensions.

The nearest species botanically to *Viburnum Lentago* is the so-called Black Haw (*Viburnum prunifolium*). This plant does not grow in New England, although it is hardy here. It is very common in the middle and southern states, and abounds in Central Park, in New York, where there are many fine specimens in the wilder wooded parts, which are made beautiful by them in early May, when the plants are in flower. This species grows to be a larger tree than *Viburnum Lentago*, and the flowers, which are more nearly white than those of that species, are decidedly handsomer; the fruit, too, is more showy. The leaves, however, are narrower and less lustrous, and, on the whole, except when it is in flower, the southern plant is less beautiful than its northern relative.

Viburnum dentatum, or Arrow-wood, is as beautiful almost as either. It is a shrub ten or fifteen feet high, which grows in rather moist soil near streams and swamps all over the northern states, and has broad lustrous leaves with large sharp teeth and very prominent veins, and produces large flat clusters of nearly white flowers. The fruit, which ripens in the early autumn, is bright blue and very ornamental. This is an excellent plant in cultivation; planted in deep well-manured soil it grows with a vigor unknown to the wild plant and produces larger and richer-colored leaves and larger and more abundant clusters of flowers. Few plants better repay good cultivation, and there are very few shrubs of any country which are more ornamental in cultivation or better worth a conspicuous place in the shrubbery.

Viburnum pubescens is a smaller plant than *Viburnum dentatum*. The leaves are smaller, narrower and more sharply pointed, and the flower-clusters are much smaller. It rarely grows more than three or four feet high by as much broad. The flowers, which appear rather earlier than those of *Viburnum dentatum*, or during the first days of June, are produced in the greatest profusion, and quite cover the plants when they are grown in good soil and allowed an abundance of light and air. This is one of the best shrubs to plant on the outer margin of a large shrubbery, and it is particularly beautiful in the autumn, when the leaves turn a rich dark purple color like that of some old Spanish leather, a most unusual color among our plants. This adds greatly to the value of *Viburnum pubescens* as an ornamental plant, and makes its cultivation particularly desirable.

Delightful, too, is *Viburnum acerifolium*, the familiar Arrow-wood of eastern woods. This is a small plant with slender stems, which rarely rise to a greater height than three or four feet, and Maple-shaped leaves, which in the autumn turn a most beautiful scarlet color. The flower-clusters are not broad, but they stand up well on the ends of the branches, and the individual flowers when they expand are bright pink, and later become creamy white. The showy black fruit remains on the branches through the winter. This is naturally a shade-loving plant, and thrives when planted under shrubs and other trees; it bears the sun, however, and apparently grows as well when fully exposed to it as it does in its native glades.

Our two native Viburnums, with nearly entire bright green leaves with obscure veins and long-stalked flower-clusters, are plants for the garden. These are *Viburnum cassinoides* and *Viburnum nudum*. No one seeing these plants cultivated for the first time can be made to believe they are common native plants. In their swamps they grow up tall and spindling, but, transplanted to good soil, and given sufficient space to spread,

they form broad, round masses of large, handsome foliage, larger, and almost as beautiful as that of the Camellia, and, in June, cover themselves with great broad clusters of creamy white flowers. Naturally they inhabit swamps, but they seem to grow better in good, well-drained soil. *Viburnum cassinoides* is a more northern plant, and flowers rather earlier than *Viburnum nudum*, a native of the region from New Jersey to Florida. Both are equally hardy here, and there is little to choose between them as garden ornaments, although the leaves of the southern species are thicker and rather more lustrous than those of its northern relative. No one will make a mistake in planting either of them or in giving them a conspicuous place in any garden, however carefully selected its contents may be.

The Cranberry-tree (*Viburnum Opulus*), the wild form of the familiar Snowball-bush, is now so well known and so commonly planted that another notice of it does not seem necessary. It occurs in all the three northern hemispheres; and it is, perhaps, worth recording that there are now growing in the Arboretum plants raised from seed sent from northern China, which are much more ornamental in flower than either the North American or the European forms; the sterile ray flowers, being twice as large, and rather more than an inch across, while the anthers, instead of being green, are bright purple. The plants are perfectly hardy, and this variety should be better known and generally planted.

But the most beautiful of all the American Viburnums, so far as concerns the flowers, is the Hobble-bush (*V. lantanoides*), figured in Garden and Forest (Vol. ii., p. 535, f. 141). It produces, like *Viburnum Opulus*, neutral ray flowers around the outside of the cymes, and these are very large and pure white. The leaves are broad and thick, and, in the autumn, turn to a brilliant scarlet color. Naturally this plant grows under the dense shade of trees in the northern forests, which it cheers in early spring with its great clusters of flowers, and again in autumn with the bright colors of its leaves. It is a difficult plant to cultivate, and we have heard of a single instance only where, brought into the garden from the woods, it has been made to grow successfully. Mr. Dawson has found that, grafted on the European *Viburnum Lantana*, it grows stronger and more vigorously than it does on its own roots, and his stock of grafted plants now gives promise of ultimate success. It is such a beautiful plant, and one so well suited to flourish under the shade of trees, that serious efforts to get it established are well worth making.

Arnold Arboretum. *P. C.*

Some Early Spiræas.

From several causes the Spiræas have not done so well at the Arboretum this season as usual. Some were injured in winter, but the most damage was done by frosts in the first week of May and again about the 18th or 19th, when a great many buds were very much hurt. This frost apparently affected the buds of the hardiest as well as the more tender of the early-flowering species.

Spiræa pubescens, of which an illustration appeared on page 331 of the first volume of Garden and Forest, proved something of a disappointment this season. In a series of perhaps a dozen plants the blossoms were uniformly straggling and few, and the numerous naked stems and branches plainly showed that the plants were either all equally injured during the past winter, although planted in different exposures, or it may be that they are short-lived and degenerate after a certain period. The plants under notice were raised from seed collected by Dr. E. Bretschneider in the mountains near Pekin, China, and sown at the Arboretum in the beginning of the year 1883. Whatever may have been the cause of its present unsatisfactory condition, *S. pubescens* is well worth cultivation and frequent propagation on account of the earliness of its blossoms. These resemble the more common species known as *S. trilobata*, or the improved form known in gardens as *S. Van Houttei*, but they are of especial value because they appear two or three weeks before the flowers of the others. The blossoms are of about the same size, and are borne in similar clusters as in the two already mentioned. The foliage is of a light green color, and the young shoots and the under sides of the leaves are quite densely pubescent or downy.

As already stated, this is one of the earliest-flowering species, but it is not so early as *S. Thunbergii*, which ranks as the very earliest of the hardy species in cultivation here. Its value lies not so much in the abundant white, early spring flowers, by which its branchlets are covered, as in the fact that the fine soft foliage makes the plant a pleasing and ornamental object throughout the season, and in the brilliancy of its foliage in late autumn it is not equaled by any other species in the genus. It is scarcely surpassed by any other hardy shrub in its autumn coloring, and it has the great merit of holding its leaves until very late in the season.

The old-fashioned double-flowered *S. prunifolia* closely follows *S. Thunbergii* in its blossoming. Like many others, the plants of this species have a bare and straggling appearance as they grow tall and old. They grow easily and rapidly, and better results in bloom will be obtained if old stocks are occasionally removed and new shoots put in their place. *S. prunifolia* is usually fairly hardy here, although the tips of the branches are often winter-killed. What has been called the single-flowered type of this plant was received at the Arboretum several years ago, but it has been so much injured every winter that it has not been possible to get any idea of its normal growth and appearance. The few blossoms which have developed in early spring, through careful winter protection, have shown much likeness to those of *S. Thunbergii*.

In small gardens, where only a limited number of plants can be grown, there is probably no Spiræa which gives such general satisfaction as the form known as *S. Van Houttei*, which is generally considered to have been derived from the Asiatic *S. trilobata*, which is smaller and not so beautiful or graceful as a flowering shrub. *S. Van Houttei* is perfectly hardy, even in such a rigorous winter climate as that at Montreal, in Canada. Besides the beauty of its long sprays of white blossoms, which appear early in June, the plant has the merit of having clean, dark green foliage throughout the remainder of the season. It usually falls, however, without assuming any striking colors in the autumn.

More beautiful and striking in its individual blossoms than any of the preceding kinds are the flowers of *S. Cantoniensis*, which is very frequently found in catalogues and gardens under the name of *S. Reevesiana*. The blossoms are much larger than any of those mentioned, in larger corymbs, and of the purest white color. But, unfortunately, in New England this plant cannot be considered sufficiently hardy to be recommended for general planting. In well-drained, sheltered situations it sometimes thrives fairly well and produces a good show of blossoms, but, under most circumstances, the stems and branches become so much injured in winter that comparatively few blossoms appear in early June, the regular flowering period.

The double-flowered form of this species is quite handsome when well grown, but it suffers equally with the type from lack of hardiness. In a little less rigorous climate *S. Cantoniensis* is one of the most beautiful species which can be grown.

Arnold Arboretum. *J. G. Jack.*

Hardy Flower Garden.

At no season of the year does the garden present a prettier appearance than at this season; the gorgeous Oriental Poppies, and the Iceland Poppies too, are at their best, with Pæonies, German Iris, *Dictamnus Fraxinella*, with its flash-light in the evening when fire is applied to it. The Pyrethrums, double and single, are also now showing their full beauty, and the recent exhibits at the meeting of the Massachusetts Horticultural Society indicate plainly that they are fast growing in favor. It is often stated that double Pyrethrums cannot be raised from seed, and this may be true of some seed, but last fall I sowed two packets of seed and the plants were grown on in pots. They are now all in flower, and fifty per cent. are double, the rest being single, and many are as good as imported named kinds. The seeds cost about twenty-five cents and were obtained from Germany. For cutting purposes these "Painted Daisies" are valuable; they last a long time, and, when mixed with sprays of such plants as *Gillenia trifoliata*, have a pretty effect. *Dodecatheon Meadia* is blooming finely, and these American Cowslips are well worth growing, even in the most select borders, but care should be taken to secure bright-colored forms, as those of a pale, undecided pink are not worth the space they occupy. In some localities this Dodecatheon can be obtained of a bright rose color, and this is worth growing. Much can be done, however, toward improving the color of the flowers by applying burnt soil or refuse.

Helianthus divaricatus, *Artemisia Pontica* and some other plants which dealers persist in advertising spread rapidly and crowd their way among their neighbors, and are most difficult to get rid of. *Heliopsis lævis* is another weedy subject which seeds abundantly in fall and appears everywhere the following summer. Dealers in hardy plants should never disseminate such subjects without a full explanation of their

habits. Stocking a garden with persistent weeds is rather worse than selling us hardy plants altogether unfitted for outdoor cultivation, a practice not altogether unknown.

Of Aquilegias there is not one prettier than the Rocky Mountain Columbine, *A. cærulea*. It is a pity that it is not a better perennial, for, with the best of care, it does not live long in gardens. If good seed could be obtained fresh from its native localities there would be plenty of purchasers both here and in Europe, as seed of this species is dearer than any other of the older kinds, and it often germinates badly or turns out to be not true to name. After *A. Canadensis*, *A. cærulea* was the first to flower with us, and it is still very beautiful.

S. Lancaster, Mass. *O. O.*

Hardy Plants for Edging a Border.

STRAIGHT lines, as "the shortest distances between two points," are entitled to some consideration, but we usually have too many of them in our small gardens. In most of the well-kept suburban gardens one can start at the front gate and follow rectilinear paths all through the garden without finding a curve or relief to the trim formality. The lawn is trimmed at the border to the straightest line, and not a twig is allowed to encroach on its smooth surface. The borders following the straight paths are usually edged with grass in narrow lines, a source of constant care, and the whole effect is very prim and formal and sometimes distressing. In our small places we cannot often change the paths, and straight ones are often more in character than curved ones, which in limited grounds seem often in bad taste. But, given such a long path bordered by a flower-bed, why not discard the grass edging and grow plants, which are not only attractive and interesting, but which from their habit of growth will form irregular lines and break the formality? There are innumerable low hardy plants suitable for such a situation, and a border of this kind may be made one of the most interesting features of the garden, if one is willing to give its planting some little study.

To prepare such a border, the ground should be well broken up to a good depth and enriched with manure. The border should be raised about six inches above the path and edged on either side with rough stones. This does not seem an attractive picture, but it will be seen that such a border will exactly suit a large number of plants which require good drainage about their crowns, and, as they are mostly deep-rooting kinds, they will find moisture. On this border should be established dwarf plants, and especially those with procumbent, or creeping, habit. These latter will soon cover the nakedness of the stones, and, as they spread into the path, will form little areas of verdure and bloom, projecting into the desert walk and softening the stiff border-line into gentle undulations. Some of these plants, in time, make spreading clumps several feet in diameter, but while they are reaching this state there will be room to grow on the edging numerous small dwarf alpines and other plants. To mention a few suitable plants among the profusion which might be named, here might grow *Arabis alpina*, *A. albida* and *A. arenosa;* the hardy Alyssums—*A. saxatile*, *A. spinosum* and *A. Montanum* (the latter now in bloom, being a charming plant, with attractive light yellow flowers); *Iberis Gibraltarica*, more hardy on the raised border than it often proves when not in a well-drained situation. Aubrietias find a congenial home in such a border, too, as do the small Sedums—and there is a wealth of dainty beauty in this family. Achilleas, *A. tomentosa*, *A. argentea*, etc., *Thymus montanus*, and many more will occur to those who are familiar with hardy plants. If one were in a hurry and plants were scarce, the Moneywort (*Lysimachia Nummularia*) would soon cover all bare spots, and at this season is very attractive, although a very common plant.

To a lover of small plants such a border is invaluable as a substitute for a rockery and safe location for those which might be lost in an ordinary border.

Elizabeth, N. J. *J. N. Gerard.*

The Vegetable Garden.—The Chelsea Pea is an improvement on American Wonder in growing slightly taller and being rather more productive. It was also as early as any of the so-called extra earlies, this season. Its quality is inferior.

Profusion is a promising late pea, and so is the Mayor. Admiral is weak and delicate in growth, too tall, and not productive. The Don is also entirely too rampant in growth. At this date, June 10th, it is still running up, and where it may stop is not yet fully apparent.

The Sandwich Radish we like very much. It is much quicker in growth than most of the white Radishes we have grown. The backward season has retarded the ripening of tomatoes, and we have noted little in regard to any varieties yet. Last year Early Ruby was ripe on the 25th of May; this year it is still green, though in advance of most others. Atlantic Prize seems ahead this season.

Devon Market Lettuce may be different in some respects from the old Curled Simpson, but I have not been able to see it. Golden Beauty Lettuce shows no particular merit above other smooth-leaved Lettuces. Trianon is doing better than we expected of a Cos Lettuce out-of-doors. It will be valuable here if sown earlier than ours was this year.

Raleigh, N. C. *W. F. Massey.*

The American Association of Nurserymen.

Annual Meeting at Minneapolis.—II.

OUR report of the Nurserymen's Meeting at Minneapolis, which was begun last week, is continued below, with some additional extracts from the papers read on that occasion and the discussions which followed.

THE NORTH-WEST AS A FIELD FOR NURSERY EXTENSION.

Professor Charles A. Keffer, of the South Dakota Agricultural College, read an essay with this title. He said that Iowa, Minnesota, Nebraska and the Dakotas had been planted thickly with orchards and fruit-gardens because they were settled by men who were home-makers as well as farmers, and who wished to reproduce on the prairies the surrounding of their homes in the east and in Europe. The failures have been countless and the successes few. The farmers are prone to attribute their loss in fruit-culture to the false representation of the tree-seller, while the nurserymen feel that a large share of the failure is due to ignorance, to an unfortunate choice of varieties, or to needless haste, that is, to planting fruit-trees before the soil and shelter were ready for them. The climatic conditions here are so trying that some means for modifying them must be devised. It is useless to hope for success with fruit-trees on the prairies until the winds are conquered by groves and forest-belts. A forest-tree can thrive in untoward conditions where a fruit-tree would perish, and the wind-break must be the precursor of the orchard. Grove-planting must be the pioneer work in horticulture, and the farmer of the north-west cannot expect a profitable orchard until he has provided a sheltered location for it. Now that the Government has withdrawn the slight encouragement it once gave to tree-planting it is a matter of vital importance to the north-west that all the persons interested in agriculture and horticulture should unite to promote what may be called prairie-forestry. It seems, then, that the first duty and the first interest of the nurseryman is to push the sale of forest-trees in the treeless west, and, when these are established, there will be abundant demand for other stock.

The Plum is the pioneer fruit of the north-western states, and we are fortunate in having a native species from which many varieties of good quality are being secured. It would certainly promote the interest of the trade if such sorts as the Miner, and all of the Chickasaw family, were discarded, north of central Iowa. Of the more hardy type the Desoto Plum is our standard variety, although in the greater part of Dakota it is too late to be relied upon, for we must have fruits in which early maturity is united with extreme hardiness. The Plum-tree, being found along the streams of western Nebraska, eastern Colorado and both the Dakotas, is presumably hardy, but many varieties are caught by the frost before the fruit ripens. Two years ago I received specimens of fruit that was ripe on the 15th of August, small native red plums of excellent cooking quality. There are now being tested on the grounds of the South Dakota Experiment Station forty varieties, and from some of these we have hopes of securing the two great essentials of hardiness and earliness.

The Apple presents a still more serious problem. The north-west cares little about an Apple-tree's genealogy, whether it is Russian or American, but we want one that will live through the winter and one that has leaves and bark to withstand intense heat and sunshine; and these requisites secured, for the immediate future we will be content with a moderate quantity of fruit of only a moderate quality. Professor Keffer said that he once thought there was no virtue in the fruit of the Crab-apple, but that was before he had moved to South Dakota. He was not prepared to discuss the relative merits of the Russian and other varieties, but only knew that good fruit of Wealthy and Fameuse is grown in the southern counties of his state in peculiarly favorable locations on the borders of the Missouri River bottom-lands.

As to the relative methods of budding and grafting trees he had no question as to the superiority of the latter. Root-grafts

with long cions make the best trees for the north-west. Nurserymen should not send a budded tree into the north-west, for it is always sure to be deficient either in the hardiness of the stock or in the union of the stock and bud. In the development of horticulture in this region nurserymen must educate the people. They must realize that wind and frost and burning heat are to be the portion of every tree that is planted, so that it is idle to sell anything there but the very hardiest stock.

NOTES ON MINNESOTA HORTICULTURE.

The extracts which follow are from an address by Samuel B. Green:

Previous to 1884 Minnesota was generally looked upon by eastern and southern growers as hardly adapted to a rational system of farming, not to speak of anything in the line of fruit-production. In that year she surprised the country by the prizes won and the show of fruit made at the New Orleans Exposition; and the fine exhibition made last year at the State Fair seemed to indicate that there was a possibility that she might do as well at the Columbia Exposition in 1893.

Apples.—Most of the well-known eastern varieties of Apples have been tried here and found greatly wanting; even the popular, prolific and handsome Ben Davis was discarded years ago as being too tender for this climate, while the Baldwin, Yellow Bell-flower, Roman Stem, Golden Russet, Winesap and a host of other favorites have been repeatedly tried and rejected. In many parts of the state the Wealthy is largely grown and bears early and heavily.

We can grow Crab-apples in great quantities, and our markets are well supplied with this home-grown fruit each season. The most generally esteemed are Transcendent, Orange, Whitney, Early Strawberry, Virginia and Hyslop. Where the old standard varieties of Apples can be grown the Russians may not be welcomed, but in this state they are very promising. Take away from us to-day the Russian Apples and their seedlings, and we would have almost nothing left in a well-tried Apple of large size that can be grown at a profit. The Duchess of Oldenburg and Tetofsky have been long and favorably known here, and our markets are liberally supplied with them each year. Minnesota orchardists who carefully cultivate the Duchess get remunerative returns. Among other Russians of promise that have been quite extensively tried are the Hibernal, Autumn Streaked, Ostrokoff, Glass, White Pigeon, Charlamoff, Green Streaked, Yellow Annis, and we hope and expect that out of the many other varieties now on trial in the state and from seedlings of those Russians to get varieties better adapted for our own use than any now known.

I believe the time is coming when Minnesota will raise enough apples to supply her own wants. It has been found by those having the largest experience that our own home-grown nursery stock stands the rigors of our trying climate much better than Eastern and Southern grown stock.

Plums.—We cannot raise the varieties of Plums of the *Prunus domestica* type without giving them winter protection, neither do varieties originating from *P. Chicasa* do well here, but all varieties of *P. Americana* yield abundantly each year, and we think there is a great future for this hardy class of Plums. Each year notes the introduction of new varieties of merit. The best well-tried kind of this class of Plums is the De Soto, but the Forest Garden and Weaver are favorably known, and the Rollingstone, Cheney and New Ulm are new kinds of great promise.

Small Fruits.—All the small fruits grow here and yield abundantly. Strawberries take the front rank in value of the product, but we also raise large crops of raspberries, currants, gooseberries and blackberries. It is generally considered profitable to cover all small-fruit plants in winter, but some growers do not go to the expense of this even with Raspberries. Cranberries can be raised at a profit, and the wild bogs produce in abundance. The fruit raised in Minnesota is of high color, flavor and aroma, and finds a ready market in the large cities and towns of the state.

Horticultural Progress.—Minnesota established the first purely horticultural experiment station in this country, in 1880, and the State Horticultural Society has to-day, besides the department of horticulture in the central experiment station, one experiment station and eight horticultural trial stations, the most of which are devoted to special lines of work. We believe that by systematic selection and crossing of many fruit-plants now grown, that their value for this climate may be greatly increased, and we also believe that several of our native fruits, notably the Sand Cherry (*Prunus pumila*), the Wild Plum (*Prunus Americana*) and the Buffalo Berry (*Shepherdea argentea*), which are very prolific in their wild state, will well repay careful cultivation. We also look with favor upon the newly introduced Russian Cherries and Pears, and the growing of Peaches, by protecting them in the winter, is attracting some attention.

Alluding to Mr. Green's commendation of the Russian Apples Mr. William C. Barry said that eastern nurserymen were very desirous to ascertain which of these varieties has an established value. Many years ago Russian Apple-trees were imported by eastern fruit-growers, but none of them had been found equal to the Duchess of Oldenburg, and, after taking much pains and trouble with these varieties, they had become discouraged. It would therefore be of advantage if the nurserymen of the north-west who had made experiments would inform eastern nurserymen which Russian Apples ought to be catalogued and disseminated. Mr. Barry had attended a great many exhibitions of fruit in different parts of the country, and he had never seen these apples on the tables, nor had he seen accurate descriptions of them, and he said that it would much more than pay him for his journey to Minneapolis if he could secure one, two, three or more varieties which were as valuable, or nearly as valuable, as the Duchess. If western nurserymen have such varieties he assured them that there was a ready market for them in the east.

Mr. Albaugh added, that in Ohio no Russian Apples, except the Duchess, had proved of real value. Out of thirty-seven grafts obtained from the Iowa Experiment Station only one variety, the Longfield, made a healthy tree at three years old. Every other one was injured by winters which have not hurt the Ben Davis nor affected Yellow Bell.

Recent Publications.

We have received advance-sheets of a Census Bulletin on the Lumber-mills, Saw-mills and Timber-products of the states of Michigan, Wisconsin and Minnesota. These states embrace the great White Pine area of the north-west, which has been so important in the development of the central portion of the continent. Of course, the returns in this bulletin are of very great interest, but they would be still more valuable if the White Pine had been treated separately as a forest product, since the exhaustion of our Pine supply is a matter of national importance and interest. But it would have been very difficult, and perhaps impossible, to divide the product of the mills so as to show at once the quantity of White Pine and of hardwood manufactured. In the Forestry Report of the Tenth Census, Professor Sargent said: "The value of the lumber product of Michigan, Wisconsin and Minnesota exceeds one-third of the total value of all the lumber manufactured in the United States. This enormous development of the lumber business is due to the excellence of the forests of the Lake region, to the natural advantages of the country for manufacturing lumber, and to the easy communication between these forests and the treeless agricultural region west of the Mississippi River. The country between the Mississippi River and the Rocky Mountains, now largely supplied with lumber from the Lake region, must soon depend more upon the remote Pine forests of the Gulf region or of those of the Pacific coast. But the great north-western pineries are not yet exhausted, and they may be expected to increase the volume of their product for a few years longer to meet the demands of the population fast covering the mid-continental plateau." This prediction is justified in the report before us, which shows an increase of mill products amounting to nearly thirty per cent. in quantity and seventy-six per cent. in value. The increase of the number of hands employed is 138 per cent., and the increase of the total amount of wages paid is 141 per cent. The disproportion between the increase of quantity of the product and its value is due to the fact that the business of finishing and remanufacturing at the point of original production has been developed largely, and this augments the gross value of the product. The increase in the output is probably due, in a large measure, to the increased use of hardwood which, in late years, has been manufactured extensively, especially in the northern peninsula of Michigan.

Minneapolis now stands at the head of the lumber-producing cities of this region, the value of the output here having reached during the census year $6,584,456. In 1880 the value of the output at the same city was $2,740,848, an output exceeded at that time both by that of Bay City and of Muskegon. The increase in this product of Minneapolis is due largely to the opening up of the northern part of Minnesota, a region which ten years ago was worked comparatively little. Of course, this bulletin cannot show the quality of the Pine-timber manufactured, but it may be that while the output is larger, it consists,

to a great extent, of small trees which ten or twenty years ago would have been passed over as of too little value to saw. During the last ten years there has been a sort of clearing up of the forests going on in these states, so that while they make a fair showing in the general output, the area of good Pine-forest is now, beyond question, "dangerously small in proportion to the consumption of White Pine lumber."

The predicted exhaustion of these forests within a comparatively short time seems assured by returns from individual manufacturers. Their present holdings of standing timber in this group of states are only sufficient to supply them for about five years at the present rate of consumption. The quantity in reserve is believed to be principally comprehended by what is standing on lands owned by the federal and state governments. This quantity, however, is unknown. The federal government supplies no information on this subject, but the holdings of public lands reported by state governments indicate that no considerable area of timbered lands is owned by the state of Michigan.

The total area of land held by the state of Wisconsin on September 30th, 1890, is reported at 671,633 acres. Most of this land is located in the northern counties, and about one-half is said to be timbered. The state of Minnesota reports ownership of 13,000,000 acres of timbered land, containing twenty billion feet of standing timber, mostly Pine, valued at $60,000,000.

Notes.

One of the most attractive shrubs now in bloom is *Philadelphus nivalis*.

Just now the beautiful old Ascension Lily, *L. candidum*, is blooming in unusual abundance in gardens near this city, the disease which has for many years affected this plant having apparently run its course.

An English authority remarks that the growths of the Asparagus which are made this season lay the foundation for the next year's crop, and that, therefore, the stronger the growth of the shoots and roots this year the better prospects for a crop next season. This is true, and it follows that it is not too late still to cover Asparagus-beds with dressings of commercial fertilizers and of well-rotted manure in order to feed the plants and strengthen the growth.

Dr. Riley, of the United States Department of Agriculture, has published a bulletin on some of the more injurious locusts of the United States, together with the means of destroying them. It contains no technical matter, and any farmer will be able to recognize the different species from the figures. The most interesting part of the work is the illustrations of the machines which have been used for the destructions of these pests. Most of the matter is to be found scattered among former reports, but the description of the method used for trapping locusts in Cyprus is new, and so is an account of the method of poisoning them with bran and arsenic, which has been used with success in California.

Among the Columbines nothing is better than *Aquilegia cærulea*. Its white variety, Alba, has been distributed as a variety of *A. chrysantha*, and is one of the best of the white Columbines as we saw it growing recently on the grounds of H. Meyer, Passaic, New Jersey. A striking plant in flower there was *Centauria Ruthenica*, a tall thistle-like plant, three to four feet high, with heads of yellow flowers an inch and a half in diameter and deeply cut leaves. *Scabiosa Caucasica*, one of the best of hardy plants, neat in habit, and with flowers of the richest blue, was also in bloom. *Heuchera sanguinea* seems to have established its reputation for hardiness, although it comes from Arizona, for it was here in perfect health and opening its deep red flowers, although it had been in an exposed situation all winter.

At a late meeting of the Royal Horticultural Society, Mr. Barron, as reported in *The Garden* of May 30th, exhibited several small flowering branches of Apple-trees to show the variations in the size and tint of their blossoms. The largest and showiest blossom was that of the Royal Codlin, the flowers being deeply tinted with dark rose. Lord Derby, rather smaller, had very showy blossoms, and Gravenstein was almost pure white. It would be interesting to make a comparison of the blossoms of varieties which are well known in cultivation in this country, and such a collection would add interest to our spring flower shows. A study of the blossoms, too, as hinted at in *The Garden*, would not be unprofitable in answering such questions as those which follow, and very many more: Are large blossoms usually followed by large-sized fruit? Is there any connection between the color of the blossom and the color of the ripe apple?

Dr. John Dougall, of St. Mungo's College, Glasgow, has a letter in a recent issue of the Glasgow *Herald* on the banana, in which he quotes from Stanley's "In Darkest Africa" to show that "for infants, persons of delicate digestion, dyspeptics, and those suffering from temporary derangements of the stomach, the flour, properly prepared, would be of universal demand." During Stanley's two attacks of gastritis a slight gruel of this flour, mixed with milk, was the only material that could be digested. It is odd, also, as pointed out in Stanley's book, that in most Banana lands—Cuba, Brazil, West Indies—the valuable properties of this fruit as an easily digested and nourishing food have been much overlooked. Dr. Dougall has made some experiments in making banana flour. He concludes that it should be made from the ripe fruit at its place of production. In trying to make it from bananas purchased in Glasgow, he obtained on drying the pulp a tough sweet mass like toasted figs, an appearance probably due to the conversion of starch into sugar. Bananas contain only about fifty per cent. of pulp, and of this about seventy-five per cent. is water. They would yield, therefore, only one-eighth part of flour.

That even Frenchmen of the seventeenth century did not always approve of strictly formal gardens is shown by the following passage, which occurs in an essay by Pierre Huet, a well-known French critic of that time, called "Of the Gardens in Fashion." The author says: "I have no more approval for the gardens in fashion than for sky-lights. I mean those open gardens, composed of large, broad, sand-strewn alleys, of trellises, parterres, adorned only with a few delicate beds, defined by strips of box and edged with a few flowers and a few stunted trees, and in which you can scarce distinguish summer from winter. M. le Nostre, who is quoted as the author of this sort of garden, which, it is asserted, he brought back from Italy, did, it is true, adapt it to the King's Gardens, but he did not adapt it alone, for he added covered alleys, shaped woods, trees of lofty trunk, palisades, and green shades. The majority of private persons, possessing neither sufficient ground nor sufficient means to give their gardens all these ornaments and keep them up, have only adopted its parterres, which require little time and expense, but in which walking is out of the question throughout the day, and in which ladies, regardful of their complexion, would only venture to appear after sunset."

In an article called the "Evolution of Patent Medicine," published in the *Popular Science Monthly* for May, Mr. Lee J. Vance traces the belief in the efficacy of such nostrums back to those ancient times when no distinction was drawn between the physician and the magician, and when all remedies were looked upon as charms—a condition which prevails, of course, among savage and half-civilized tribes in our own times. The names of plants, Mr. Vance explains, shows how general was the belief in their inexplicable virtues. "Some plants have animal prefixes, as, Dog-elder, Dog-rose, Cat's-tail, Cow-bane, etc. Other plants derive their names from religious sources. Thus they are associated with the Virgin Mary, Saint John the Baptist, Saint James. Likewise the Latter-day Saints have particular plants dedicated to their memory. Most of the plants with mystic names were supposed to have magical virtues, and so they were largely used in folk-medicine. The weird associations clustering around many roots and herbs were enough to invest them with great repute," and in folk-medicine, even at the present day, "herbs are used not so much for their inherent medical properties as for their reputed magical virtues. . . . Another stage in the evolution of patent medicine is typified in the therapeutics of medieval mystics and alchemists. The great plant in their pharmacopœia was the Mandrake. Why? Simply because the roots of this plant were shaped like the human body. . . . The magical element in patent medicines actually won scientific repute in the 'doctrine of signatures'—a doctrine which held that plants and minerals, by their external character, indicated the particular disease for which Nature had intended them as remedies. Thus the Euphrasia, or Eyebright, was good for the eyes; the Wood-sorrel, being shaped like a heart, for the heart; the Liverwort for the liver, and so on. Pettigrew, in his history of medical superstition, says that this fanciful and magical notion 'led to serious errors in practice' and often to fatal results. Observe that at this stage of its evolution patent medicine is herb medicine, and so it remained for a long time. The materials of the healing art were all vegetable. The patent-medicine man was a dealer in herbs."

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The President and the Public Forests.

WE have more than once alluded to a section in the act repealing the timber-culture laws, which was approved on the last day of the last session of Congress, and which authorizes the President of the United States, from time to time, to set apart public lands bearing forests or in part covered with timber or undergrowth as public reservations. The final clause of the section reads as follows: "And the President shall by public proclamation declare the establishment of such reservations and the limits thereof." This section has been interpreted as having a more than permissive force. Commissioner Carter, of the General Land Office, has issued a circular to special agents, in which it is held that, for the purpose of carrying into effect the provisions of the act, it is important to reserve all public lands which bear forests or which are covered with timber or undergrowth on which the timber is not absolutely required for the legitimate use and necessities of the residents of the territory or state in which these lands are situated, or for the promotion of settlement or for the development of the natural resources of the region in the immediate vicinity of the forest-lands in question.

The circular goes on to instruct the agents that it is of the first importance to reserve all public lands in mountainous and other regions which are covered with timber or undergrowth, at the head-waters of rivers and along the banks of streams, where such forests are the natural agents for absorbing moisture, checking mountain torrents and preventing the sudden melting of the snow and the floods which follow. Special agents are directed to make a personal examination of such forest-lands, and to acquaint themselves in every possible way with the facts as to the value of these lands for all purposes, and such investigations are to be reported to the Land Office. Furthermore, they are to submit a report, with a recommendation in each case, as to whether the lands examined should be set apart as a reservation, together with the reasons for this recommendation. This recommendation and the reasons therefor, with the full description of the lands under investigation, are to be published in the land offices and in the newspapers of the vicinity, and it must be stated that the object of such publication is to give timely notice of the proposed reservation, so that all persons who have any interest, either in favor of or in opposition to its establishment, may have an opportunity to petition or remonstrate. This must be done in time to have these views considered before final action is taken in regard to the establishment of a reservation. Wherever there seems to be any imminent danger to the timber of any particular tract which has been considered as a proper one for reservation, the agent is to report this danger at once and state his reasons for believing that there is necessity for immediate action.

All this is done in order to lay before the President such information as will enable him to take intelligent action thereon. Of course, there are other means of acquiring information which the President can make use of, and it is altogether proper that any one who has any special knowledge in this direction shall place it at his service. The American Forestry Association, we are glad to see, is taking steps to examine certain forest-areas in order to ascertain whether they should be reserved from settlement. There is very little danger that the Chief Executive of the nation will include too large a fraction of the public domain in these reservations; and even if lands which are more valuable for agriculture than for their forests should be included, it would be very easy afterward to turn them over to settlers. Indeed, we have urged that all forest-lands should be withheld from entry until the data which special agents of the Land Office are now instructed to collect could be ascertained by a commission of scientific men. The present action, however, is much better than no action at all; but what protection is there thrown around these reservations even after the President has made his proclamation to set them apart? So far as we are aware, no legal provision is made for guarding them against depredation or protecting them from fire. It has been our opinion that the United States army was the proper force to use in guarding the forests on the national domain, and we have urged that these forest-lands withdrawn from entry should be placed under the charge of the army. This has been done to some extent in the case of the Yellowstone reservation and the great Sequoia reservations of California. If it is practicable to place such reservations as are declared by the President under this same guardianship, we shall feel that something has been done for our forests which promises to have practical value, and the brief section which was attached to an act relating to quite another matter may prove an important piece of legislation in the history of the forests of the nation.

Do New Englanders Love Flowers?

MR. HAMILTON AIDÉ, in his article in the *Nineteenth Century*, on "Social Aspects of American Life," ventures the remark that "the true love of flowers, the patient, careful love—not the cupidity for cut roses at two dollars apiece—does not seem to be inherent in the national character," and alludes to Miss Wilkins' stories to show that "flowers are an accident, not a daily interest, in village life" in New England.

This might pass as a snap-judgment on the part of a foreign traveler, but how shall we excuse the critic in the *Boston Transcript*, who declares that he "cannot deny the truth of what Mr. Aidé says." He who takes this ground can scarcely be familiar with the old country towns of that section to which one must look for the typical aspects of New England life. Like all the sentiments of its people, the love of flowers is there, not paraded, but profoundly cherished; and if there is no gaudy display in the door-yard, there is sure to be found a corner behind the house,

easily accessible to the kitchen, where old-fashioned plants bloom gayly, and are cherished often from some tender association with the past. Any country doctor in one of the older New England villages can tell these critics that there are almost no houses so homely, but he finds in them, in winter, a few plants in the window, and in summer some bright flowers in a tiny garden, cultivated and watered often by feeble and tired hands. Hard and dreary as are many of the poor little lives of New England villagers, this one touch of color and perfume is there almost invariably, to show that the thirst for beauty is unquenched.

If, with its ungrateful soil and tormenting climate, New England cannot rival Old England in the gay surroundings of its cottage doors, the same love of flowers is there, finding such expression as it may under the cruel conditions of a sterile earth, and burning summer heats and dryness, alternated with sharp east winds, which make a labor as well as a pleasure of a garden.

The Bermuda Palmetto.

WE published last week two views of the Bermuda Cedar (*Juniperus Bermudiana*). On page 307 of the present issue there is reproduced a photograph of the Bermuda Palmetto (*Sabal Blackburniana*) as it appears growing in its native marshes, a species endemic to the islands, and the most interesting plant of their flora after the Cedar. Botanically this Bermuda Palm closely resembles the Palmetto of the coast of Carolina and Florida (*S. Palmetto*), and there is little doubt that, like the Cedar, it was first brought by birds from the mainland, and afterward gradually underwent the slight modifications which serve to distinguish it from its remote ancestor. So very near alike are the two plants that it is only in recent years that the insular Palm has been recognized as a distinct species. It is a curious fact, moreover, that this Palm, although so recently understood, has been cultivated in England a long time without the origin of the cultivated plants being known. The wild specimens sent to Kew for determination, Mr. Hemsley tells us in his botanical report on "The Scientific Results of the Voyage of H. M. S. Challenger," "proved to belong to a species of Palm of which there is evidence that it has been cultivated in England for at least one hundred and fifty years, and of which, besides numerous small ones, there is a magnificent example in the Palm-house at Kew which flowers and bears fruit continuously. The origin of the cultivated Palm was involved in obscurity. In 1737 a small plant of it was presented by Lord Petre to the grandfather of the Mr. Blackburn for whom it was named. The earliest record of its flowering in this country that we have found is in 1818."

S. Blackburniana grows in Bermuda to the height of forty or fifty feet, with a trunk diameter of from twelve to sixteen inches, and produces leaves six or eight feet across, borne on stout stems seven or eight feet in length. At the base of the leaf-blade there is a broad yellow spot which surrounds the end of the stalk and serves to distinguish the Bermuda Palm at a glance from its continental relative. The fruit of the insular plant is considerably larger, too, and was once held in much esteem as an article of food. Jourdan, in his "Discovery of the Bahmudas, otherwise called the Isle of Divels, by Sir Thomas Gates, Sir George Somers and Captain Newport, with divers others," states that "there is a tree called a Palmito-tree which hath a very sweete berrie, upon which the hogs doe most feede; but our men finding the sweetnesse of them did willingly share with the hogs for them, they being very pleasant and wholesome, which made them carelesse almost of any bread with their meate; which occasioned us to carry in a manner all that store of flour we could save for Virginia. The head of the Palmito-tree is very good meate either raw or sodden. It yeeldeth a head which weigheth about twenty pounds, and is farre better meate than any cabbige."

The Palmetto is frequently mentioned in the early annals of the islands, and laws were passed for its preservation. An intoxicating beverage, known as "bibey," was distilled from it, and the leaves have always been used for thatch and for baskets, fans and various fancy articles; and all the vegetables exported from the islands were until a few years ago sent away in the small oblong baskets plaited from Palmetto-leaves. These baskets, now replaced by boxes made of cheap American pine, have almost entirely disappeared, and are only to be found in the shops devoted to supplying the tourist with natural curiosities and other mementos of a visit to the Insulæ æstivarum.

Kew and its Work.

THE following extract is from an article in a recent issue of the *Gardeners' Chronicle*, and it is the preface to some account of the successful journey of Mr. Morris, the Assistant Director of the Royal Gardens, to the West Indies in the interest of economic botany. Now that a movement is on foot for the establishment of a botanic garden in this city it is proper that the people at large should be informed of the possibilities of such an institution, and of what would be expected from it and from its management:

When, in 1841, Sir William Hooker undertook the direction of the Royal Gardens, Kew, that foreseeing botanist laid down a triple course of action. Kew was to be the botanical centre of the empire in a threefold capacity—as a great scientific institution, the headquarters of economic botany, and as a pleasure-ground for the public; each department was to be made as perfect in itself as possible, each was to co-operate with the others for the common benefit. How successfully the idea has been carried out by successive directors is known to all our readers. Kew, as a scientific institution, is absolutely indispensable, and is the acknowledged head of all similar bodies, at home or abroad. In the "gardens," where "collection" was once the dominant aim, selection now prevails. The best and the most suitable plants for particular purposes are grown in masses, so that their qualifications can the better be estimated, while each individual is so cultivated as to display to the fullest advantage its botanical and ornamental characters. Of course, while demonstrations (we use the word in its educational sense) of this character are given for the benefit of the gardener and the delectation of the public, the equally or, so far as Kew is concerned, the much more important functions of experimental cultivation are not neglected. This may not be very attractive to the casual visitor, but it is of the utmost importance to botany and horticulture, and, of course, it furnishes the basis for those more decorative "demonstrations" of which mention has been made. While a certain amount of mere decorative gardening, according to conventional pattern, cannot be dispensed with in a great pleasure-resort like Kew, competition with ordinary gardens and parks in these respects is hardly to be desired. We look to Kew to set the fashion, not to follow it. We depend on it to furnish us with new materials, new illustrations, new developments, new combinations. The educational and instructional element should, without being offensively obtrusive, permeate the whole garden, so that the visitor, delighted with what he sees before him, may, at the same time, and it may be imperceptibly, receive impressions which will serve to expand and refine his taste, and augment his intelligence in the future.

But, in addition to the purely scientific and æsthetic functions which this great garden performs, Kew is the centre of economic botany. The phraseology is somewhat pedantic, but we do not know how to mend it, for the term "applied botany" is hardly more familiar. A visit to either of the Kew museums (there are three) shows, however, at a glance, what is meant, and is calculated to conciliate any gradgrinds who might be disposed to grumble at the expenditure of public moneys for purposes they do not appreciate. These museums furnish the best available concrete reply to the question, which, even in these days of scientific progress and its resultant advantage, some people still put, "Cui bono?" ("What is the use?") From the very first the energies of directors and curators have been turned strongly in this direction, museums have been formed, libraries accumulated, and floras written at Kew expressly with this object. The residents in the colonies have been furnished not only with information

as to the plants to be grown with the greatest advantage commercially, but with the plants themselves. We need not do more than incidentally mention the great part that Kew has taken in the diffusion of such plants as Cinchona, Coffee, Caoutchouc and many others.

Who can estimate the value of the labors which have been carried on in those quiet-looking propagating-houses at Kew for the last half century?

How We Renewed an Old Place.

XI.—RECLAIMING A SALT-MEADOW.

THE fable of Metius Curtius plunging on horseback into the morass which had opened in the Roman Forum, because the oracle had declared that only the best thing in Rome would be of avail to close it up, seems simply to show that the Romans, great engineers as they were, fully recognized that filling up a marsh was a well-nigh endless job, which would require the sacrifice of the best blood and treasure of the state before it was accomplished.

In spite of the illustrious warning given by M. Curtius, there lives not a man with soul so dead as not to be fired with ambition to make dry ground out of his meadow, if he is so unlucky as to own one; and he always starts in with figures on paper to show what a fine income of hay is to result from a comparatively small investment of labor and gravel. But the work goes on, then more work and more gravel, till finally the account of this part of the business gets mislaid, so that by the time the far-distant hay-crop begins to materialize, a page has settled over the amount of capital (literally) sunk, and only the hay returns are brought prominently to the front.

When we first surveyed the half acre or so of salt-grass which had been left over on our side of the fence when the road was built across the meadow, it did not seem of much importance, one way or the other. The English grass grew luxuriantly down to the edge of it, and the soft, fine, salt-hay was excellent for bedding, the only objection being that it was so palatable that the horses ate up their mattress before breakfast every morning.

After the causeway was constructed across the wet ground behind the stable to Winter Street, there did not seem very much reason for meddling further with the marsh, but given a gravel-bank at one end of a farm, and a swamp at the other, and you may depend upon it there will be a marriage between them at no very distant date.

The intercourse between the two of our acquaintance, once begun, was seldom interrupted, the more the meadow saw of the hill the more it wanted to see, and, with a perversity only to be found in meadows, the more it was given the more it wanted of the same kind.

At first it seemed as if a few cart-loads of stones dumped in the lowest parts, where the water stood longest, would be all-sufficient, but the amount of material that this anaconda of a marsh can stow away is, to use the slang of the day, phenomenal.

Piles of stones, rubbish, sand, boughs of trees, old crockery, ashes, the débris of our own and other people's places, it "swallows them all without any remorse," till the top of the fence along the road has nearly disappeared from view, and still it calls for more, and continues to subside.

Across the street our neighbors have tried the experiment before us, so that we are aware that it is unsafe to put soil on this gravel until after it has had a chance to settle for a year or two, otherwise a high tide is liable to come and wash away all the loam out to sea.

As the surface rises the fresh water runs off less easily, so that the enterprise gains in magnitude as it goes along, and the space covered promises to turn out a whole acre instead of half a one, before the job is fairly completed.

Still, time and the hill will fill even this capacious maw, and, though at present in a sketchy condition, the meadow gives promise of a beautiful grass field, which, it is to be hoped, will repay all the labor of its construction.

The tradition goes that the building of the street behind us across his meadow-lot was too much for the gentleman who owned the place at the time it was made, and that he never recovered from the shock of having his estate thus divided and his house-lot spoiled. The enterprise was a formidable one, for it involved the construction of a great stone arch across the stream that drains the meadow, and the laying down of heavy plank rafts for the piers of the stone bridge to stand upon. For years and years the road would be built up to a good height every summer, and then would subside under the influence of the high tides in the autumn and spring, till it seemed as if it would never hold its own, and keep its head above water all the year round.

But constant renewals of the layers of gravel have at length made of it so substantial a causeway that nothing but the very highest of spring-tides prevails against it, and such water as finds itself on our side, forces itself rather under than over it.

Those of our neighbors who have reclaimed land from the main meadow on the other side of the road, have done so by first building a kind of rough dam of stones and clay, and then gradually filling in behind this dam with rubbish, and stones, and sand until they reach the level of the street. When properly covered with loam, after having had plenty of time to settle, this well-watered foundation affords excellent soil for grass, which grows upon it with great luxuriance.

As the road acts still further for a dam between us and the meadow, our task becomes simpler, and we can reclaim our piece of land with far less trouble than our neighbors have had with theirs, and we are encouraged to look for equally good results.

But it is distressing to see the surface of the hill, which we would fain see rolling in graceful slopes to the swale, waving with the forest of our imagination, still vexed by the presence of carts and horses, and torn by the torturing spade.

He who undertakes to change the face of Nature must needs have patience. Monarchs like Nebuchadnezzar may hang gardens in the air in a few months, or a Louis Fourteenth may construct a pleasure-ground like Versailles, by the aid of forty millions and the genius of Le Nôtre, in a few years; but one who has not the resources of an empire at command must imitate more closely Nature's own deliberate and tortuous methods, often seeing the labor of years destroyed in a moment by an unforeseen freak of the old dame, who resents being interfered with, or finding to his dismay that his own scheme has been a mistaken one, and must be revised.

An illustrious townsman of ours started out like ourselves with a bit of salt-meadow, in which he laboriously constructed a pond, spending his hours of ease from the cares of state in building a wall about it, to make a neat and appropriate curb. But after this was accomplished, with much trouble, it proved not to be at all what he wanted, so that there was nothing for it but to fill the hole, and with months of labor bring the meadow into a smoothly turfed field.

Our day of repentance has not yet dawned, but we have a fear that it lurks somewhere behind the horizon. Some modern Metius Curtius may yet have to be found to help fill up the marsh with a horse and wagon, for that Charybdis has already taken toll more than once from a dump-cart, though she has not yet succeeded in swallowing it up in spite of various malicious efforts. She has designs upon the cow, only frustrated by careful watchfulness, and to her deep treachery there is no end. The family purse she long ago put in her pocket, and her mouth yawns for all the future revenues that may accrue for her benefit. She has eaten up a large part of a neighbor's hill, besides taking most unbecoming bites out of our own, and if ever future generations weave a legend about the ancient dragon of Overlea, which demanded a victim every summer, it will be traced by the unraveler of myths of the period, to the unremitting appetite of this hungry meadow.

But who, looking out, on some sweet spring day, upon that beguiling distance, could believe ill of anything so softly lovely as the picturesque marsh of which ours is the fag-end. In the foreground, the richest tones of green are gently blending in the grass; in the middle distance a point runs out toward the stream, laden with fruit-trees in snowy bloom; the Willows near and far are putting on their gray-green coats, making a tender shimmer around their swaying branches and graceful twigs. The little river winds blue and full, here and there amid the grassy stretches, and the distant hills are full of opalescent hues of emerald and pearl, with red of tree-stems, and faintest green hints of foliage, such as Monet would love to paint. The houses of the port, not yet quite veiled by leaves, make spots of white and yellow and red against the deepening background of Elms and Maples. A streak of blue still indicates the harbor; by to-morrow it will have disappeared, for the vision changes like a kaleidoscope—the white of Pear-blossoms passing like a cloud, to be succeeded by the rosy blush of Apple-buds. Each day some well-known feature of the winter landscape grows fainter as the leaves expand, till of a sudden you look for it and it has gone, and in its stead are the full-robed trees. Over all domes a blue sky streaked with faint white cirrus clouds, only the azure reflected in the placid stream below.

An impressionist alone could catch this fleeting beauty of early May—to-day one thing, to-morrow another—and fix it

eternally upon his canvas. The tender grace of early spring, and the glowing glory of autumn are alike evanescent and wonderful expressions on this smiling meadow face. Like a dream, this hint of ineffable beauty melts away, and the impression gives place to a reality of vivid green field, and dark blue water, which will make but a pleasant inland landscape until the August sun burnishes it into ruby and gold, and makes it once more a vision for a painter.

The exquisite must perforce be evanescent, that no touch of commonness may mar its distinction.

The tender grace of a day that is dead

haunts many a spot, otherwise tame enough, with a memory and a knowledge of its capabilities, that make it forever dear and beautiful to him who has seen it under that enchanting glamour lent by a season, or an hour, which imprints upon the brain a picture that can never be forgotten. And when at other times of year I look upon this far reach of often-changing meadow, there abides with it always a memory of the soft and tender charm of early spring, that no reality of November-brown, or winter-snow can wholly drive away.

Hingham, Mass. *M. C. Robbins.*

Winter Studies of the Pine Barren Flora of Lake Michigan.—VI.

NEXT in abundance among the conifers is the White Pine (*P. Strobus*), either in moister and richer ground or mingled with the Gray Pine and Oaks upon the ridges. The trees are mostly small, none more than a couple of feet in diameter. The bright green soft and slender leaves, two to four inches long and in bundles of five, are somewhat tufted at the ends of the branches, giving to this Pine a grace too little appreciated by those in search of trees for ornamental planting. There is a feathery softness in the foliage of the White Pine which is lacking in that of the Scotch and the Austrian Pine, so often seen in parks or in private grounds. The foreign trees appear stiff and rugged beside it. The branches of the older trees are nearly horizontal, and rather slender near the end, and, when the leafage is heavy, may curve or droop a little on this account, and when moved by the wind wave to and fro with a graceful motion. But the wind generally gives them a broken, choppy motion, like a subsiding water-surface on which the storm has spent its force. This is more apparent when their tops can be looked down upon from some commanding height. For use in parks, particularly if the soil is light or sandy, this Pine is admirably adapted. I once came into a pure wood of this tree near Michigan City, Indiana, which had evidently been cared for by the proprietor. The trees were young, the trunks from six inches to a foot in diameter, and not crowded for standards of such dimensions. As a result, the limbs were lower down, and the crowns rounder and more spreading than when pressed upon by others in the thick forest. The sandy ground, well covered by fallen leaves, was completely shaded, and the cool, refreshing grove showed the possibilities of this Pine for park purposes, either when available as a natural wood or planted in harmony with its natural conditions.

Another conifer is the White Cedar, or American Arbor-vitæ (*Thuya occidentalis*). The small trees, from ten to twenty feet in height, either border the sloughs or form small groves in the moist grounds, but are nowhere abundant. Though its foliage resembles that of the Gray Pine in color, in other respects it is quite in contrast with it. This is shown by the form and arrangement of its scale-like leaves, its flat, fan-shaped spray, its numerous branches, the smaller drooping and twisted so as to point various ways, and its bole covered with light-colored shreddy bark. The Red Cedar (*Juniperus Virginiana*) is sparingly found either in company with the White Cedar, or oftener in drier ground. It is scarcely taller, the trunks being rarely more than six or eight inches through. Nearly all are beautiful trees, almost perfect spires, though somewhat grim in habit. The spray is dense, beginning near the ground, and the branches shorten so gradually as to make a conical mass of foliage. The leaves are rusty green and but slightly glossy, and in the winter change to a tanny brown and other shades, which impart to the crown a purplish hue. By means of its different tints it is readily distinguished from the White Cedars, even at a distance, and charmingly varies the effect when grouped with them, its purples and browns mingled with their light, and, in the winter, somewhat faded green. The ordinary, or more typical, leaves of the Red Cedar are blunt and scale-like, but near the ends of the more vigorously growing branches they are stiff and prickly pointed, like those of the common Juniper, though considerably smaller. The youngest trees, till they reach the height of a man, have leaves almost wholly of this character, and entire branches on older trees may be found that look as if a branch from a different species had been fastened to it. I have taken from the same tree three forms of spray—that with ordinary leaves, that with the pointed, awl-shaped leaves, and that with the two commingled.

The common Juniper (*Juniperus communis*) is often met with, especially near the shore of the lake, though clumps of it occur throughout the sand region, so that it is the most widely diffused of the conifers here. Some of the shrubs attain a large size, the prostrate limbs from three to six inches in diameter. Clumps are found more than thirty feet across in their longer diameter, their general shape being oval or circular. Those, from a single root, sometimes measure twenty-five feet, and those from ten to fifteen feet are not unusual. The color of the bushes is considerably variegated in the winter. The smaller branches are brownish or purplish near the end, the leaves changing somewhat in color. Lower down, or nearer the ground, they preserve their look of glossy green. The lower surface of the leaves shows more in the cold weather than in the summer. The spray is flattish, but the ultimate branches tend to rise into a vertical position, or twist upon their support, thus interfering with their flatness, and exposing the glaucous under sides of the leaves, so that the ends of the branches seem to be covered with hoar-frost. The appearance is so deceptive that upon a day suitable for frost actual touch may be needed to convince one of his error. This varies their color still more. The green or bluish green berries are commonly abundant, and this also gives variety to their general appearance. These do not assume their dark blue color till the season following the time of flowering, the fruit ripening the second year.

There are occasional groves of Tamarack (*Larix laricina*), or some trees may be found by the edges of sphagnous swamps. The largest areas comprise but a few acres, and on the whole the tree is scarce. It is of low stature and bushy-branched, the limbs usually coming low down upon the trunk. The recent shoots are brownish or reddish gray, but the ground color of the mass of the spray in the winter season is very dark, the bark on many limbs, either from its own decay or from some fungoid growth, being coated with a sooty substance, which may be rubbed off like a black dust. The branches are nearly horizontal, and divide into numerous short, straight and very slender branchlets, on which rest the round or cylindrical buds, often wider than the twigs themselves. The prominence of these buds when the limbs are bare of leaves gives to the spray of the Tamarack a peculiarly roughened appearance, as if covered with wart-like bodies.

Englewood, Ill. *E. J. Hill.*

Plant Notes.

Some Recent Portraits.

The June issue of the *Botanical Magazine* contains figures of the new *Lilium Henryi* (t. 7177), one of the interesting plants discovered by Dr. Augustine Henry in western China. From Dr. Henry's notes it appears that "it occurs in two situations, both near the town of Ichang, in the Hupeh province, on the grassy slopes of precipices at an altitude of 200 to 2,000 feet above the sea-level. A few specimens occur on the eastern side of the dome, a mass of conglomerate, which rises to about 1,800 feet, and which lies ten miles south of Ichang. The plant is very plentiful on the right bank of the Ichang gorge, between the villages of Ping-shan-pa and Shih-pi-shan, and on the grassy slopes of the limestone cliffs inland from the last-named village, from which the path leads up to the Taout monastery, named Yang-tai-kuan." *Lilium Henryi* flowered at Kew in August, 1889. It is a species with bright yellow flowers two or three inches long with lanceolate segments reflexing when expanded from near the base and furnished with numerous red-brown spots, and toward the base with a green keel and a few large clavate bright yellow papillæ; *Cypripedium Klotzschianum* (t. 7178), a showy species discovered in British Guiana during Sir Robert Schomburgk's second exploring expedition in that country. With regard to the affinities of this species, it is stated in Veitch's Manual of Orchidaceous Plants that, "though when not in flower, it is scarcely distinguishable from *C. caricinum*, the nearest affinity is undoubtedly with *C. Lindleyanum*"; *Aphelandra Blanchetiana* (t. 7179), a showy acanthaceous plant and a native of Brazil; *Edgeworthia Gardnerii* (t. 7180), a native of the Himalayas, extending eastward into China and Japan, in which last country it is also extensively cultivated, as it furnishes a valuable

material for making the best kind of paper. The genus contains this species only, and differs from Daphne only in its longer style and stigma. It makes, in Europe, a handsome greenhouse plant when well grown, and formerly was much more frequently cultivated than at present; *Colchicum Sibthorpii* (t. 7181); this is said by Mr. Baker to be the finest of all the Colchicums in cultivation. It is a native of the mountains of Greece and of Macedonia, ascending to an elevation of 5,000 feet above the level of the sea. In its distinctly tessellated flowers it agrees with *C. variegatum* and *C. Parkinsoni*, although the segments of the perianth are much broader than in those species, and the leaves, like those of *C. autumnale*, are suberect, obtuse, and not at all undulate. It has only been introduced lately into cultivation, the corms cultivated at Kew having been sent to the Royal Gardens by Max Leichtlin in August, 1890; the flowers are produced in the autumn and are bright mauve-lilac, and are borne in from one to five-flowered clusters. The perianth has a stout white tube from three to four inches long, with a campanulate limb, oblong-obtuse segments two inches long and distinctly tessellated on the inner surface. The stamens, which are about half the length of the perianth-segments, bear large linear yellow anthers.

Foreign Correspondence.

London Letter.

Orchids.—*Disa Veitchii* is the result of crossing *D. grandiflora* with *D. racemosa*, and is another addition to the many first-rate hybrid Orchids raised in the establishment of Messrs. J. Veitch & Sons, Chelsea. The late Dr. Moore proved at Glasnevin, many years ago, that *D. grandiflora* could be propagated from seeds almost as easily as Gloxinias; Messrs. James Backhouse & Sons, of York, also have raised large quantities of this plant from seeds. The habit and general characters of the comparatively new *D. racemosa* are very similar to those of *D. grandiflora*, while its behavior under cultivation, so far, has been uniformly good, which is more than can be said of the Table Mountain plant. A cross between these two, therefore, was almost certain to prove good in a garden sense, and Messrs. Veitch lost no time in putting it to the test, for *D. racemosa* did not flower in England until 1888, when it bloomed at Kew, yet a plant of the hybrid was exhibited in bloom at the last meeting of the Royal Horticultural Society, although only twenty-one months old. No doubt, the hybrid will be much finer even in a year or two than now, but it is a really first-rate Orchid as it is. In habit and foliage it resembles both its parents, but the flower is like that of *D. grandiflora* in size and form, while in its bright rose-mauve color it resembles *D. racemosa*. The chief merit of this plant lies in its being within the reach of every one, either by repeating the cross or by means of offsets, which are produced freely by both parents, and, no doubt, will be by the hybrid. *D. racemosa* is now represented by about twenty spikes of flowers in the Kew collection. As I have said several times already, it is a beautiful Orchid, and as easy to cultivate as *Odontoglossum crispum*. *D. tripetaloides* is also in bloom here; it has racemes a foot long, each bearing about a dozen white flowers spotted with rose.

Lælia Arnoldiana.—Messrs. Sander & Co. have just flowered a most beautiful hybrid, which they have named in compliment to Mr. Hicks Arnold, of New York. It is the result of crossing *L. purpurata* with *Cattleya labiata*. The plant has the general appearance of *L. purpurata*, and so has the flower, but it differs in having a large labellum, fully two inches across the front lobe, which is colored deep amethyst-purple, darkening to maroon in the throat, where there are a few veins of a golden-yellow color. The sepals and petals are of good substance, and colored a soft rosy mauve.

Sobralia macrantha Keinastiana is a pure white form of the well-known *S. macrantha*. It was shown in flower by Baron Schrœder, and obtained a first-class certificate. It is the best of all the colorless varieties of *S. macrantha* hitherto seen, the sepals and petals being snow-white, the only color being a blotch of golden yellow in the throat of the labellum.

Hæmanthus Katherinæ is a very handsome stove bulb which is so easy to manage, and blooms so freely, that it deserves a place in every collection of stove plants. It was introduced to Kew in 1877, and figured in the *Botanical Magazine*, t. 6778. Since then it has seeded in various gardens, and some of the seedling varieties are much superior to the type. The best is known as Alice Barr, or Superbus, and has very large heads of bloom, one which I saw from Mr. Gumbleton last year being nine inches in diameter and colored rich scarlet. This species does not require to be dried off at any time.

Bauhinia Galpini.—This is a promising garden-plant, and, therefore, an exception to almost every one of the many species of Bauhinia which have been tried in the garden at one time and another. It has lately been introduced to Kew by means of seeds sent from the Transvaal by Mr. E. Galpin, who describes it as "a handsome bush, about five feet high, with large red flowers, and certainly the plant of plants so far as the De Kaap vegetation is concerned." Mr. Galpin sent flowering specimens which bore out his statements with regard to the beauty of this species, and the behavior of the plants in cultivation at Kew is all that could be desired, as they grow freely and form shapely elegant pot-shrubs. As yet they are too young to flower, but Mr. N. E. Brown, of the Kew Herbarium, has drawn up a description of the plant, which is published this week in the *Gardeners' Chronicle*. The leaves are of the usual two-lobed form which characterizes all the plants of this genus, and the flowers are in axillary racemes which, in wild specimens, are extremely abundant upon every branch. Being found at an elevation of about 2,000 feet, or not far from the home of *Clematis Stanleyi*, this species is certain to thrive in a geenhouse. Like all Bauhinias, it revels in sunshine and a moderate allowance of moisture. We have plants a yard high which promise well for flowering shortly.

The only other species of Bauhinia which have proved worthy the notice of horticulturists are *B. corymbosa*, from China, and *B. Natalensis*. There are over a score species in cultivation at Kew, and while some, such as *B. Vahlii*, are handsome foliage plants, deserving a place in large stoves, they rarely produce blossoms, notwithstanding their well-known free-flowering behavior in a wild state.

Celmisia spectabilis.—The Celmisias are peculiar to New Zealand, where they grow at high elevations, and are known as Mountain Daisies. Twenty-five species have been described, and almost every one is of such a character as would find favor in the garden. Unfortunately, however, they are exceedingly difficult to introduce, either by means of plants or seeds, and, notwithstanding the repeated efforts made by the Kew authorities and others, they remain still almost unknown in English horticulture. We possess two, however, namely, *C. Lindsayi*, which has been at Kew ten years, and of which a figure was published in the *Botanical Magazine*, t. 7134, and *B. spectabilis*, of which Messrs. J. Veitch & Sons exhibited a small plant in flower at the last meeting of the Royal Horticultural Society, where it obtained a first-class certificate. This plant was six inches high, the leaves lanceolate, rather rigid, thickly felted beneath with silky wool and silvery upon the surface. The flowers were daisy-like, erect, about two inches across, the disk golden yellow and the ray-florets pure white. There is a very fine example of this species at Kew, but it has not yet flowered. It thrives in a cold pit, where it receives protection from frost in winter and exposure to sunlight in summer. It is a striking and interesting plant even when not in flower. Last year we succeeded in getting from New Zealand to Kew no less than nine species of Celmisia, which arrived alive, but every one failed to grow. If we can only hit upon the right way to import these plants, our gardens will be considerably enriched thereby.

London. *W. Watson.*

Cultural Department.

Memoranda from the Strawberry-field.

After an examination of my rows I am once more of the opinion that we have no berry as yet to surpass Bubach No. 5 for general culture. The season here has been and beyond all precedent, and most berries are severely dried up. All are injured, but Bubach No. 5 gives us good berries and in large quantities. It is a solid and finely flavored fruit, and never badly shaped; the color a deep red. I shall make it my staple berry in fall-planted grounds. It is pistillate, and that is its only drawback. The size is very uniform, the foliage ample, the growth rapid, and the roots strong.

Sharpless must still hold its place as one of the first for quality, size and productiveness; at least on my soil, which is strong clay, it is very productive. I have planted Ontario largely, and it is possible it is not the same as Sharpless; but they are so closely similar that it is not worth while to keep them apart.

Cumberland, for a very early berry, is yet unsurpassed by any I have tried. I am growing fifty sorts, and, year by year, this old acquaintance turns up so fine that it loses no marks of

high standing. The berry is roundish, large and very sweet. It is light red and handsome. There is very little waste from small berries, and never any waste from ill-shaped ones. It not only does well in all parts of the country, but in all localities—in the shade nearly as well as in the sun. I have them growing under my Grape-vines, and even there the fruit is smooth and handsome. Both Cumberland and Sharpless are bisexual.

Haverland has this year failed to give me its usual large berries; but it stands in matted rows. I think this berry, to do its best, must have either hill-culture or be grown in very narrow rows. It is a rampant grower and feeder, and needs room for each plant. It bears enormously, and, at its best, very large long berries. In flavor it is not up to the highest rank. It is pistillate, and not suitable for distant shipment.

Jessie I shall drop out. It needs petting to bring out its best qualities, and is never a heavy cropper. The plant is vigorous and the flower perfect. The quality is also excellent. It has, in fact, enough good points to make it available as a fertilizer for pistillate sorts.

Warfield No. 2 I have tested thoroughly in different fields, and, while it bears good crops, I want no more of it. The berry much resembles Wilson, is quite as sour, and not of standard flavor. The berries hang down close to the ground, and are not as large, on the average, as those of the Wilson. The fruit is solid, and bears shipment well; the blossom is pistillate.

Mrs. Cleveland is not of the best flavor, but it is a superb bearer, and the quality is at least good. The size is very large, and the form not quite regular, but in no way distorted. I do not think any one will make a mistake in planting this berry freely. The flower is pistillate.

A companion berry, sent out by Mr. Townsend, of Ohio, is the Eureka. This pleases me in growth, in berry, in crop and in foliage. The fruit is very large and of fine quality, not equal, however, to Sharpless or Cumberland. The growth is a trifle less luxuriant than that of Mrs. Cleveland, but they both make runners very fast. Both grow well in hill or matted rows. Some varieties, when matted, make so close growth as to stifle each other, which is not the case with either Eureka or Mrs. Cleveland.

Among the not quite new but still scarce sorts I select, as two exceedingly fine ones, Pearl and Florence. Pearl is a truly good berry every way. It stands up well on strong stalks, its form is regular and conical, with a slight neck. It grows rapidly, vigorously, and bears splendid crops. I like the looks of it, both in the row and the basket. The quality is fine. Florence has also a tall stalk, bears freely a conical berry, bright red and handsome. Mark these as attractive berries, and both of them good to win buyers. Florence, with me, makes the largest stools, but Pearl makes the most rapid growth. They can both be planted with confidence. Pearl has a perfect flower and produces pollen freely.

Michel's Early, if I have the real plant, is a disappointment. It is not as early as Crystal City, and not very much larger. It is a rampant grower, a good bearer, and the fruit stands up well. When dead-ripe the flavor is good, but peculiar. It bears considerable resemblance to Crystal City in style of growth and fruit.

Belmont is not a success in my grounds. I think it will be profitable only under a system of highest culture. I am even compelled to drop out that delicious berry, the Prince of Berries, a handsome and excellent fruit, but slow grower and impracticable every way.

Among those that I admire is Summit, and until this year have insisted on growing it. I cannot hold one of the berries in my hand without thinking of a small pear. It is as large as some Seckels, and most delicious; but it is a very poor grower, as well as so slow in ripening, as to make it another of the impracticables.

Gypsey is delicious, early, handsome, medium in size. It is also a moderately good grower, but the quantity of fruit does not warrant large plantings, while the foliage is not strong nor abundant.

One berry I have replanted and am satisfied I did not do it justice by the first test—that is Lida. It bears abundantly large berries of good quality, and has many claims as a first-rate fruit.

Of strawberries, even more than of other fruits, one must speak with much caution, because different varieties require different soil. My own fall-planting will include (1) Bubach, (2) Sharpless, (3) Cumberland, (4) Eureka, (5) Mrs. Cleveland, (6) Pearl, (7) Haverland, and there will be further test of Thompson's No. 51, as well as Tippecanoe, Saunders, Middlefield, Parker Earle and Edgar Queen.

The extraordinary dryness of the present season has taught me the absolute need of irrigation. I shall adopt the easy plan of having my Strawberry-garden below my barn, so that I can carry water to it in pipes from a well. This many can do.

Clinton, N. Y. *E. P. Powell.*

Stray Notes from the Arnold Arboretum.—II.

SOMETHING was said last week in these notes of the beauty of our native Viburnums, and of their great value for planting in gardens, and on the wilder parts of city parks and of large private estates.

Equally valuable, certainly, for such purposes, are many of our native Cornels, several of which are more graceful in habit than any of the Viburnums, and which, although usually not quite as ornamental in their flowers, produce generally more highly colored and showier fruits. The bark of the branches of some of the species is bright colored, and, in winter, when the plants are stripped of their leaves they make a brave show and offer bright bits of color which are invaluable in the winter landscape.

The most beautiful of all the Cornels which grow spontaneously in this part of the world is the so-called Flowering Dogwood, *Cornus florida;* and here, in parentheses, it may be affirmed that this plant is not poisonous. Many people think so because a so-called Dogwood, like the Poison Ivy, has acrid juices which are extremely poisonous to most persons, but here is a case which illustrates the confusion which often follows the promiscuous use of vernacular names for plants instead of the precise and exact names imposed on them by science, and which, in nine cases out of ten, are not more difficult to learn and to remember than English names. "The Poison Dogwood" is not a Dogwood at all, but a sort of Sumach, or Rhus; and the Poison Ivy is not an Ivy or anything like an Ivy, except that it sometimes climbs by the aid of rootlets produced from the stems; and none of the Dogwoods are at all poisonous. Here, then, are three popular errors about three of our most common and best-known plants which have all come from the unfortunate coining of popular names which are now so firmly fixed that they will probably be used as long as the English language is spoken on this continent. It may be a small matter in speaking of a Rhus to call it an Ivy, but it is rather unfortunate when this looseness in the use of language casts a suspicion on one of the most beautiful of all trees. For the Flowering Dogwood, or *C. florida* as people ought to learn to call it, is not excelled in beauty by many other trees.

It has all the qualities which make plants valuable from the ornamental point of view. In habit it is a low, round-headed tree, sometimes at the south forty feet high, but at the north rarely growing to half that height. The flowers, to be sure, are small and not at all conspicuous, but the clusters are surrounded by large snowy white floral bracts or leaves, which, when they are fully grown, make what look from a little distance like white four-petaled flowers, each two or three inches across. These floral leaves, and the flowers themselves, develop before the appearance of the true leaves, so that when the plant is in flower it looks as if it had been covered with a white sheet.

The illustration which was published on page 431, vol. iii., of Garden and Forest shows what a beautiful object this tree is in early spring. The foliage is abundant, ample in size, and of cheerful and pleasant colors, yellow green on the upper surface and pale on the lower. Very few of our trees, perhaps not a single one, are more beautiful in the autumn than *C. florida*. It is worth growing for the autumn effect which the foliage affords, quite apart from its beauty as a flowering tree. Here, in New England, toward the end of October the leaves take on their autumn coloring, a deep and intense red, which makes the trees conspicuous from as far as they can be seen. The color of the leaves changes only on the upper surface, while the lower surface retains its pale color, so that when the wind plays through the branches charming contrasts of color are produced between the upper and lower sides of the leaves. The beauty of the tree in autumn is increased, too, by the abundant fruit which is produced in heads or clusters, each fruit being rather less than an inch long and bright scarlet. Birds are fond of the fruit, and often strip the trees as soon as it ripens, but when it escapes their attention it serves to heighten by contrast the color of the foliage, and gives to the tree a warm, cheerful look which is not easy to explain by words.

C. florida is one of the best of all the small trees to plant in this country as a specimen on a small lawn or in a garden. It needs good soil, and in eastern New England rather a shel-

Fig. 53.—The Bermuda Palmetto *(Sabal Blackburniana)* in the Devonshire Marshes.—See page 302.

tered situation, for we are close to the northern limit of its range, and, although it is found here and there growing wild in the woods, it is a comparatively rare tree, while in the middle and southern states it is one of the most common of all the smaller inhabitants of the forest. The best place, however, in which to plant *C. florida* is on the borders of natural woods—that is, in those situations which it selects itself—on the margins of clumps of larger trees, in woodland glades, and in all the places where an attempt is made to produce by planting natural effects. It can be introduced with advantage much more freely than it has been before into our large parks, in which sufficient attention is rarely paid to making the margins of the plantation as beautiful as it is possible to make them by the use of the material which is ready to the hand of the American planter. It is only in recent years that nurserymen have begun to learn what a valuable and useful plant *C. florida* is, and it can now be purchased in considerable quantities in a few of our nurseries. We should probably have seen more of it in American gardens if it had been a favorite plant in England, upon which country we still depend more than we should for horticultural ideas, and from which we formerly obtained nearly all our ornamental plants. But *C. florida* needs the hot sun of our long summers to thoroughly ripen its wood and to make it flower freely; and not finding in England the proper conditions, it has rarely shown there its real beauty.

Abnormal forms, whether of habit or of flower, rarely equal natural types in beauty, and, as a rule, are not to be commended. There is a variety of *C. florida*, however, in cultivation with pink, instead of white, flower-bracts, which is really a handsome plant, although considerable prejudice has been created against it by the absurd overcoloring of the bracts as they appear in illustrations in the sale-lists of nurserymen who are seeking to make a market for it. The bracts are really delicate pure pink, and trees of this variety planted with those of the common form ought to produce very charming color-effects. There is a variety, too, in which all the branches are more or less pendulous. This is not, however, a very handsome or desirable plant, as the round top and rather formal outline this tree assumes naturally is one of its great attractions.

The forests of North America produce a Cornel which is even more beautiful than *Cornus florida*. This is *C. Nuttallii* of the Pacific coast, which may be described as a giant *C. florida*. It is often a tree sixty feet high or more, with large leaves and immense floral bracts, which sometimes form heads six inches across. For some reason or other this tree does not take kindly to cultivation, and although efforts have been made for years to induce it to grow, they have so far been unsuccessful. Other trees of the region where it grows flourish in Europe, and a few of them, like the Vine Maple, do well here; but *C. Nuttallii* cannot be persuaded to live in cultivation for more than a year or two. The seeds germinate freely enough, but the seedlings go off before they are a foot high. If these notes are read by any one who has succeeded in cultivating this tree he will confer a favor on the readers of Garden and Forest if he will give them the benefit of his experiences with it.

The Asiatic representatives of this peculiar group of Cornus with large flower-bracts, which, although they are really Cornels, are generally spoken of as Benthamias, are less showy in flower than *C. florida*, although the Himalayan species (*C. capitata*) produces much larger and finer heads of fruit; this is a beautiful tree, which ought to be planted in the south, where, in some regions like central Georgia, it would doubtless succeed. The Japanese plant of this section (*C. Kousa*) was introduced into our gardens many years ago, and now flowers in the neighborhood of New York every year. Here it is not very hardy, and, as an ornamental plant, has nothing to recommend it over *C. florida*, for a poor form of which it might well be mistaken.

The eastern states produce a number of shrubby Cornels and one arborescent species besides *Cornus florida*. This is *C. alternifolia*, so named because the branchlets and the leaves, instead of being placed opposite to each other on the branches, as is the case with most of the Cornels, are alternate. This plant, like some of the Viburnums, is a surprise to most persons who see it well cultivated for the first time and who are unwilling to believe that this common road-side shrub, or small tree, can become such a wonderful object when it is set in rich soil and allowed to develop its peculiar method of growth. This peculiarity consists in the whorl-like arrangement of the branches, which leave the main stems at right angles and form flat stages one above the other, the whole making a regular pyramid from the ground upward. In old age the lower branches usually disappear; the upper branches lengthen out and form a low flat top which is very characteristic of the species as it appears in its native state, growing in broad coppices on rich hill-sides, or by the borders of country roads, where it is often very common, or near the margins of swamps. The branchlets of *C. alternifolia* are bright green and more or less streaked with white. The leaves, which taper at the two ends, are not more than three or four inches long and are clustered near the ends of the branchlets; they are light green in color, with yellow shades, and very bright and cheerful, but in autumn do not assume a brilliant color before falling. The flower-clusters, which stand up all over the top of the flat branches and so make a great show, are not individually very large, and the flowers of which they are composed are small and pale yellow; and it is the arrangement of the flower-clusters and their great number which make this such a conspicuous plant in the middle of June and not the individual beauty of the flowers. The fruit, which is deep blue when it is ripe, is very beautiful, however, its appearance being heightened by the contrast it makes with the bright red stems on which it is borne.

C. alternifolia has been very largely planted in the Arboretum in many situations, and has proved satisfactory in all of them. It is, perhaps, most ornamental as it stands near the margins of the roads and has been given sufficient space in which to send out its wide-spreading branches. It is not to be surpassed, however, as a specimen plant for the lawn, and it is surprising that its beauty for such a use was not recognized long ago; or it would be surprising in any country except this, where the almost entire neglect of native plants is one of the remarkable and unfortunate features of the recent development of American horticulture.

In another issue of these notes the claims of some of the shrubby Cornels of our wood-sides for ornamental planting will be considered, and something will perhaps be added concerning a few foreign species.

Arnold Arboretum. *P. C.*

A Few Irises.

THE Japanese Irises are at present the most attractive flowers in the hardy garden, and their wonderful blooms will continue for several weeks to make the principal display of the season. Among the countless Irises, *I. lævigata* is unique for entire distinctness of flower both in form and coloring. The petals or falls, while having a tendency to flatness, show all manner of graceful curves and wavings as they expand, and are free from all stiffness and coarseness so usual in large flowers. Their colorings are as singular as their forms, the most attractive, to my taste, being the pure white ones and those with violet veinings. Among them are deep dull reds and purples, nearly black, not without attraction. With flowers gracefully poised over the tall rush-like leaves, and swaying to every breath of wind, there are few more attractive plants of any season than Kæmpfer's Irises.

A few Irises loosely arranged in a tall vase make a striking floral arrangement. Their flowers are not very lasting if plucked when fully expanded, but if cut before they commence to unfold they retain their freshness several days. Like many of the flowers which ripen their pollen rapidly and are self-fertilizing—Poppies and single Dahlias, for instance—cutting at an early stage gives them a check, the pollen matures more slowly, and they retain their petals much longer than if plucked later.

A writer in Garden and Forest some time since expressed a fear that some one would double the Iris. As these Irises are the only species possessing double flowers, perhaps I may be permitted to say here that it seems a hypercritical taste which would object to them. The number of petals is simply doubled, making a flower with a somewhat full outline. Among the numerous forms of Japanese Irises it is doubtful if any are finer than the kinds originally imported by Mr. Thomas Hogg, which were the first seen here. One can secure, however, an endless variety, and as they cross readily and have a tendency to sport, it is interesting to grow seedlings. They seed freely, and strong plants may be had from these the third year. In any position the flowers are large enough to please the average grower, but where very large flowers are desired it is usual to grow the plants where they can have large supplies of water. It will not do, however, to plant them in standing water, for they are not aquatic—at least they do not grow for me with roots submerged.

In my limited experience I find it difficult to believe that any of the Irises are properly classed as aquatic. Of course, I am aware that a number of varieties are found in standing water, and live and grow under this condition, but I do not

know any variety which does not grow better in a less wet position. Remove an *I. versicolor* from the marsh, where it is often found, and plant it in a damp border, or even a moderately dry one, and it will be found to grow much more vigorously, with taller foliage and abundant flowers. Perhaps nature does not make a mistake exactly in planting them in marshes, but their usual location there is probably due to the fact that their abundant seeds find in such a place the necessary moisture for their germination.

In writing plant notes one usually hesitates to recommend plants for general culture, but in the case of Japanese Irises there can be no hesitation in saying that they are plants for everybody and every garden, large or small, grand or humble. They are not continuous bloomers, but, when not furnished with flowers, the tall rush-like foliage is persistent and attractive through the season.

I. juncea and *I. Pavonia*, just out of flower, are two bulbous Irises which cannot be so strongly recommended for general culture, but they are plants of great beauty, if of somewhat less pronounced a type, and are well worth the necessary attention. *I. juncea*, the rush-leaved Algerian Iris, proves hardy here in a warm border. The foliage is very narrow, about a foot high. The flowers are large, of a clear, deep, golden yellow, and are about the most attractive Iris flowers of this color. *I. Pavonia*, the Peacock Iris, is (or was) botanically known as a Moræa, and is a Cape bulb, and, as such, is usually treated like the Ixias in a frame or cold house, where they come into bloom in May or June. Their flowers are very attractive, with white falls distinctly blotched at the base with a peacock eye. The flowers are small, and their beauty is of a dainty order. These bulbs, I find, are fairly hardy, as they flowered a few days since in a very exposed border where they were planted in October. Such a position, however, is scarcely suitable, and possibly the experiment might not be often so successful.

Elizabeth, N. J. *J. N. Gerard.*

Notes on American Wild Flowers.

Lilium Grayi is one of our best native plants. It is not only a very attractive species when in bloom, but it seems to be as easy to grow as the common Meadow Lily or the Swamp Lily. It is about the same height as the *L. Canadense*, and the color is a mixture of red and yellow, as with some varieties of that species; but the petals of the long funnel-shaped flower are not reflexed, as in most of our species, and this distinction is its most prominent feature. It is among the first to flower, coming into bloom about with *L. Parryi* and a little later than *L. Columbianum*. A rare local species, inhabiting certain portions of the southern Alleghanies, *L. Grayi* has not until quite recently been easy to obtain.

The purple Corn-flower (*Echinacea purpurea*), which flowers early in June, is a striking member of the composite family, about three feet high, bearing one to three, or sometimes more, large rose-purple flowers with a brownish purple centre. If the petals stood out horizontally the flowers would be from three to five inches wide, but they generally have a half-drooping habit, which not only lessens the width of the flower, but it gives them a peculiar appearance. It ought to be a useful plant in cultivation. Its odd shape and color and time of flowering are all in its favor.

Coreopsis palmata is a more erect plant in habit than *C. lanceolata*, which is so generally cultivated. Its flowers, though not so large and showy, much resemble those of *C. lanceolata*. It seems to be a little later in flowering, so that it would afford cut blooms after *C. lanceolata* had passed. It is quite as hardy as the other, and needs the same soil and sunny exposure.

Asclepias purpurescens (Purple Milk-weed), which grows on dry banks and borders of woods, comes into flower early in June, and is one of the most showy species. To me it is quite as attractive a plant as the Butterfly-weed (*A. tuberosa*), which has been in cultivation for some time, and blooms earlier. It is frequently seen in the shade, but the richest flowers are found in full sunlight. It transplants well, and needs no special treatment.

Monarda Bradburyana is our earliest species, growing in dry half-shaded places, only about fifteen inches high, and bearing a terminal whorled head of pale purple flowers. A useful plant for a dry partly shaded place, remaining a long time in flower. Its near relative, *Blephelia ciliata*, flowers only a few days later, and has slightly darker flowers.

Nemastylis Brunnea, Watson, is a new species which Mr. Pringle found in Mexico in the summer of 1889. Its flowers are open, bell-shaped, nearly an inch wide, light purple outside, and yellow-purple and white within. It has a long grass-like leaf much like some of the smaller species of Tigridia, and needs the same treatment. The flowers seem to be a little more durable than are some of this genus.

Pentstemon lævigatus, var. *digitalis*, bears large showy heads of white flowers. The heads or panicles are often four inches or more in length, well filled with the large flowers, which are an inch or more long. It likes a moist, but not wet, clay soil, either in the full sunlight or in partly sheltered situations.

Botanical Garden, St. Louis, Mo. *F. H. H.*

Rogiera gratissima.—This beautiful greenhouse-plant resembles a Laurustinus in growth and general habit, and, like it, produces flowers in large terminal trusses. A native of the highlands of Central America, it does well in a cool greenhouse, with the same treatment given to Camellias. It is best to plant it out, as it likes root-room. The fragrant flowers are produced several times each year. The foliage is bold and of a rich dark green. It is a very free bloomer, and when young should have some of the flower-buds pinched out as they appear, or the plant will be weakened by over-blooming. It is easily propagated from cuttings taken from half-ripened wood, and placed in a gentle bottom heat.

Maywood, N. J. *James P. Taplin.*

An Orchid Anthracnose.—Several complaints have reached us from Orchid growers of a decay which, in its worst form, destroys entire plants. The trouble is first noticed by a discoloration of the stem, which rapidly turns brown, and almost black, the succulent interior becoming a mass of decay. Following this, upon the smooth exterior, small pimples appear, which finally develop into the spore-bearing spots of the fungus—a species of Glœosporium. It does not appear to be the *G. cinctum*, B. & C., of the Orchid, as its spores are twice as large, and straight instead of curved. However, the main point to insist on is, that the trouble can readily spread through an Orchid-house if the keeper neglects to collect and burn all decaying stems or leaves in their early stages of decay before the fungus has time to mature its crop of rapidly germinating spores.

Rutgers College. *Byron D. Halsted.*

Correspondence.

The Cultivation of Acacia Farnesiana, or Cassie, in Europe.

To the Editor of Garden and Forest:

Sir,—These notes on the cultivation of a North American tree in Europe may interest some of your readers. The *Acacia Farnesiana*, commonly called in France Cassie or Cassier, is a large shrubby tree in cultivation here, eighteen to thirty feet high, according to the fertility of the soil where it grows, with spiny branches, compound leaves, and orange or yellow fragrant flowers collected in small globular axillary heads on the branches of the year. It is cultivated in various parts of Provence for its flowers, used in the manufacture of perfumes, especially in the neighborhood of the town of Grasse, which is the centre of this industry.

A sandy soil is preferred for Cassie, and situations on the southern slopes of hills open to the sun and protected from the cold north winds. The plant is destroyed, or the branches, at least, are killed back if the thermometer falls below six degrees centigrade below zero, a rare occurrence in the regions where it is cultivated. *Acacia Farnesiana* succeeds equally well on limestone soil and grows to a larger size than it does on granite; it flowers, however, later, and this is a serious objection, as the flowers which appear late in the season are much less fragrant than those developed earlier. The plant is propagated by seeds, and their germination can be hastened by soaking them in water for thirty or forty hours in order to soften the outer coat.

The seed is sown in March and April in beds of carefully prepared soil, exposed to the south, and these beds are frequently watered to hasten the germination of the seed and the growth of the young plants. The following year these are transplanted to the ground where they are to stand permanently, and are set six feet apart each way in order that they may have sufficient room for the development of their branches, and to allow the cultivation of the soil between them with the plow, or, as is usually the case, by hand. The ground should be kept clean between the plants, and it is usually thoroughly cultivated every spring, and enriched from time to time with a good coating of manure. As the flowers

are gathered by women and children it is necessary to prevent the plants from growing to their full height. To accomplish this it is customary to stop the main stem of the young plant at about two feet from the ground. This causes it to form several main branches, and these are cut every year in such a manner as to give to the plant the form of a vase, this being the shape best suited to produce the largest quantity of flowers near the ground, the plants being kept down to a height of five or six feet. The plants continue to produce flowers from the middle of summer to the middle of autumn, and a few flowers continue to appear until frost, that is, until the middle of November or the commencement of December. The first flowers, however, those which open during hot weather, are much more valuable than those produced late in the season. For this reason cultivators use every effort to advance the flowering period.

The flowers are always gathered in the morning and are turned over at once to the manufacturers. It is estimated that a fully grown plant in good condition will produce a kilogram of flowers during the season worth from five to seven francs, according as the supply is more or less abundant. A hectare (about two and a half acres) produces, on an average, eleven thousand pounds of flowers.

The flowers are never distilled, the only process used to extract the perfume being that known as "enfleurage." The essence of Cassie is used in the preparation of pomades, to perfume oils or to make extracts of different species, the preparation of which is more or less the secret of the perfumers of Grasse. The process of "enfleurage" consists in spreading flowers over glass plates covered with a layer of pure grease three or four millimetres thick. This is turned over two or three times a week, or until it is impregnated with the perfume—a process which usually requires a period of twenty-five or thirty days. The impregnated grease is then distilled in order to obtain the pure essence, a kilogram of flowers producing three or four grams of the essence. The process of "enfleurage" is also performed with hot oil. Olive oil of the best quality is poured into large heated kettles, into which are put the Cassie-flowers. The oil is then heated to the boiling point, or almost to the boiling point. Workmen provided with large wooden spoons keep turning the flowers to prevent them from falling to the bottom of the kettle, where they would burn. When this operation has been continued long enough the whole of the contents of the kettle, flowers and oil, is poured into little sacks, which are compressed under an hydraulic press. In this way the perfumed oil of Cassie is obtained. It is not easy to explain these processes, and they cannot be thoroughly understood unless they can be seen in operation.

In addition to the typical *Acacia Farnesiana* a remarkable variety, discovered about fifteen years ago, is now cultivated. This is the *Acacia Farnesiana sempervirens*. It is said to be much more valuable than the ancient form, and is a larger, more robust and productive plant. It requires, however, more room. Plants of this variety ought not to be set less than fifteen feet apart, and need abundant watering and manuring during the summer. This variety is hardier than the type, and it grows more rapidly. Its principal advantage over the ordinary *Acacia Farnesiana* is found in the fact that it produces two crops of flowers in a year—the first at the end of the summer, the other in the spring. It is now largely and profitably cultivated in the neighborhood of Grasse.

Antibes, France. *Charles Naudin.*

Forest Fires.

To the Editor of Garden and Forest:

Sir,—During the month of May the papers were filled with accounts of forest-fires, but only a fraction of the cases where serious damage is done is ever reported in the press. Where one acre of valuable Pine is destroyed, there are 80 or 100 acres burned over of what would be a forest in the future. Whole townships were literally devastated, and a cloud of smoke more or less dense hung over the whole of northern Wisconsin and the upper peninsula of Michigan, as well as the northern part of the lower peninsula of Michigan. From a private source I learned of one lumberman losing 50,000,000 feet of standing pine in primeval forests. Numberless camps, with all their outfit, including even the horses in some cases, have been destroyed, with vast quantities of lumber and logs, and dams used for driving logs; in short, everything which fire can consume is swept away by these conflagrations. They cannot be stopped or checked. Spread over a large area, the induced currents of air become fierce gales, the heat becomes so intense that men cannot bear it; the sand becomes red-hot, and turf and mold and roots of trees—everything burns. Sparks and flaming brands are carried long distances beyond the line where the fire is raging, starting blazes in new places; rivers and swamps offer no obstructions. Even rain is but a temporary check, and when the next dry time comes, from smoldering embers in decayed trees or from the depth of some body of turf, the flames break out afresh. Smothered fires may keep alive in such places until a heavy mantle of snow finally puts them all out. How are our Pine-woods to have insurance against fire under such conditions? Generally speaking, our hard-wood forests are proof against fires to the extent, at least, that old forests do not easily suffer. This is not always so, however, and in severe fires like those of the present year mile upon mile of hard-wood timber may be destroyed.

The lumbermen are careful in all their operations not to allow fire to escape them. Farmers, in clearing the land by burning, and hunters and fishermen are usually the culprits, and timber-owners are helpless to prevent it. "What are we going to do about it?"

Milwaukee, Wis. *Charles L. Mann.*

Old Fort Erie.

To the Editor of Garden and Forest:

Sir,—There is a historic spot in plain view from this city that is curiously favored by nature, and yet but for the near neighborhood of an excursion steamer's landing it would be rarely visited. Old Fort Erie is now nothing but a bewildering labyrinth of tumble-down walls and grass-grown embankments, a simple pasture-field, with no habitation near, but it has a breezy situation and a wonderfully varied outlook. The soft outline of Lake Erie, and the steady, quiet flow of the Niagara as it leaves the lake, have no suggestions of war, and one is delighted to find the whole slope on which the fort lies sown, as it were, with that old favorite of all lovers of sweet-scented flowers, the thorny Sweet-brier, or Eglantine (*Rosa rubiginosa*). The heavy turf and unprotected field seems not at all suited to this shrub, yet it is here in profusion on every side of the fort, and when the bright pink blossoms are out, here about the last of June, the air is loaded with fragrance.

I find Sweet-brier stems close under the remaining walls of the fort at least an inch and a half through, though sheep-pasturage has kept most of the plants small. New shoots are now coming up of an almost scarlet hue in their luxuriance, and, as they are simple at first, like the Bramble, they are very striking. But for the pasturing the field is subjected to, it would be a wilderness of Sweet-brier, for the moat no longer holds water, except here and there, where the shallow depths are given up to Water Plantain, crawfish and snails.

As if the Eglantine alone were not considered striking enough for the spot, there are scattered over it two species of Thorn (*Cratægus coccinea* and *C. tomentosa*), the former of which is (June 6th) in full blossom, and the latter just beginning to show bloom. These masses of white flowers, soon to be replaced by the delicate pink of the Sweet-brier, seem a sort of mild reproach to the nations who within the century made war on each other in this now most peaceful and restful spot.

Along the river opposite the old fort at this season only two or three wild plants are conspicuous. *Cynoglossum officinale*, or Hound's-tongue, grows with especial vigor, and the shaggy Henbane (*Hyoscyamus niger*) is now in blossom. Later on *Datura Stramonium* forms thickets on the bank close to the water.

Buffalo, N. Y. *J. C.*

Recent Publications.

The Second Annual Report of the Missouri Botanical Garden, St. Louis, 1891, has reached us. It contains the report of the officers of the Board, the second annual report of the director, an account of the proceedings at the first annual banquet given by the trustees to gardeners, florists and nurserymen, which was held in December of last year at the rooms of the Mercantile Club, and finally Professor Trelease's revision of the "North American Species of Epilobium," which is accompanied with forty-eight lithographed plates. The volume is further illustrated with views, taken in the greenhouses of the garden, of a neglected and of a well-pruned Apple-tree, and of some bunches of Delaware grapes, showing the good results obtained by bagging. Professor Trelease, in his report, shows that solid work is being done in the garden, which is better equipped financially than any similar establishment of its kind in the world, the total receipts of income from September 1st, 1889, to December 31st, 1890, having amounted to no less than

$120,841.93, an income which ought to enable the managers to develop in time the most important botanical establishment in the world.

Professor Trelease has, very wisely we think, devoted much attention to building up a great library and to placing the herbarium on a good working basis. These two are always the important departments in a garden of this nature. Without them a scientific garden cannot be maintained or operated, and its fame and usefulness will be great or small in proportion as these departments are largely or imperfectly developed. The garden is fortunate in possessing the herbarium which was formed by the late Dr. Engelmann, and which is especially rich in those families of plants which he studied specially, such as the *Cactaceæ*, the Conifers, the Oaks, the Gentians, etc. It contains the types of many species, and must always be consulted by persons who desire to learn everything that there is to be known about these plants.

The library, it appears, has received constant additions during the year, no less than $6,000 having been expended for the purchase of books. Numerous donations, all mainly in the form of pamphlets, have been made to it. Little attention has been paid to the purchase of recent works, the available funds being used in securing rare old works and in completing the necessary sets of serials. This is as it should be, for the older books on botany are every year becoming scarcer and more expensive, and good judges of such matters believe that at the end of another fifteen or twenty years many standard works will have entirely disappeared from the market, many public libraries now buying them, not only in the United States, but in Australia and other English-speaking colonies.

We venture to congratulate Professor Trelease on the substantial progress he is making in building up an institution which Mr. Shaw's liberality has made possible. That his success is real, and that he is working on the right lines, this handsome volume abundantly indicates.

The Forest-trees of North America. By Asa Gray. Plates prepared between the years 1849–1859. Smithsonian Institution, Washington, 1891.

When the Smithsonian Institution was established, the first secretary, the late Professor Joseph Henry, proposed to publish a series of contributions to knowledge consisting of memoirs on different branches of sciences, as well as a series of reports on the progress of knowledge to be of a more popular nature and intended for wider distribution than the contributions. The second of the latter series undertaken by the Institution was announced in the secretary's report of 1848, and was to consist of a report on the forest-trees of North America, by Dr. Asa Gray. It was intended in the work to give figures from original drawings of the flowers, leaves, fruit, etc., of each principal species in the United States proper, for the most part of the size of nature, and so executed as to furnish colored or uncolored copies, the first being intended to give an adequate idea of the species, and the second for greater cheapness and for general diffusion. It was proposed to accompany this report with an introductory dissertation giving the present state of the knowledge of the subject, divested as much as possible of all unnecessary technical terms, of the anatomy, morphology and physiology of the tree, tracing its growth from the embryo to its full development and reproduction by the formation of the fruit and seed. A number of plates of this work were made, but Dr. Gray's absence in Europe, and the many calls made upon his time while at home, prevented him from ever preparing any text to accompany them. The work was found to be an expensive undertaking, and after about ten years had been devoted to preparing a number of plates it was finally suspended, and the whole matter was allowed to rest until some more favorable opportunity should present itself for carrying it on. This time never came, and the stones engraved from beautifully colored drawings by Isaac Sprague, with a number of imprints from them, remained in Dr. Gray's custody at Cambridge until after his death, which occurred three years ago. They were then sent to Washington, and the present secretary of the Smithsonian Institution, Professor Langley, has determined to distribute them to the principal botanists and museums of the world "as mementos of the distinguished man who gave so much of his life and labors to this department of knowledge." They are now issued in pamphlet form. The species which are illustrated are *Magnolia grandiflora, M. glauca, M. Fraseri* (which to our mind is the most attractive picture of the series), *Liriodendron Tulipifera, Tilia Americana, Acer rubrum, A. spicatum, Æsculus glabra, Æ. discolor* (that is, *Æ. octandra hybrida* of the new Silva of North America), *Æ. parviflora* (which can hardly be considered a tree), *Robinia Pseudacacia, R. viscosa, Cercis Canadensis, Gymnocladus Canadensis* (the staminate flowers only being shown), *Gleditschia triacanthos, Prunus Americana, P. Chicasa, Cerasus Pennsylvanica, C. Virginiana, C. serotina, Pyrus coronaria* and *Cornus alternifolia.*

Exhibitions.

The Massachusetts Horticultural Show.

THE Rose and Strawberry Show of the Massachusetts Horticultural Society, held in Boston on Tuesday, Wednesday and Thursday of last week, fell far behind similar exhibitions in late years, both in the number and quality of the exhibits. This was due to the unprecedented weather of the previous month. A dry spring with late frosts was followed in early June by a period of exceptional drought, with three or four days of intense heat, followed in the week preceding the show by a cold rain-storm of several days' duration. Nothing could be much worse for the production of good Roses, as the exhibition showed.

The local exhibitors made a poor show, and if it had not been for the large collections of flowers sent by Mr. Joseph S. Fay, of Wood's Holl, Massachusetts, there would hardly have been a Rose show at all. The effect of climate was clearly shown in Mr. Fay's flowers, which have been subjected to less trying conditions than those grown in the eastern part of the state. Mr. Fay took no less than eight first prizes for Roses, besides making a good show of vegetables, for which he took also several prizes. Among individual Roses shown none, perhaps, were better than the pure white Gloria Lyonaise, a rather tender Rose usually, but this year seen in unusual perfection. Very fine, too, were Prince de Portia and Thomas Mills. Unusually good specimens of Her Majesty, a very miffy subject usually, were shown by William Patterson, of Quincy. The special prize for the Ulrich Brunner Rose, offered by Dixon & Sons, of Belfast, brought out some good examples of this fine Rose—Joseph S. Fay being awarded the first and John L. Gardner the second prizes.

Mr. E. W. Gilmore, of North Easton, staged a collection of small, well-grown and well-flowered Orchids, taking the first prize for six, the second going to John L. Gardner. The prize for the best specimen Orchid was also awarded to Mr. Gilmore for an excellent plant of *Phalænopsis grandiflora.* A remarkable specimen of *Ouviranda fenestralis* was shown by R. Gardner, gardener to Cornelius Vanderbilt, Esq., of Newport. This is a curious aquatic plant from Madagascar known as the Lace-leaf, or Lattice-leaf-plant, with long narrow leaves composed of a net-work of vascular tissue resembling lace or a window covered with lattice-work. It has to be grown in water in a high temperature. Mr. Gardner's plant was admirably grown, and was shown in a large tub of water placed immediately under an electric light, so that visitors in the evening could see and enjoy the peculiar structure of the foliage. Benjamin Gray, of Malden, showed a tub with a flowering plant of the always attractive and interesting Japanese Nelumbium, and the Hon. Robert C. Winthrop sent pots of Gloxinias and of tuberous Begonias, besides a large collection of Gloxinia-flowers of an excellent strain.

The Strawberries, like the Roses, showed the effects of the dry season. The first prize was taken by Mr. Joseph S. Cowles, the gardener of Fairman Rogers, Esq., of Newport, for Sharpless. The second and third prizes were taken by Belmont, now a great favorite in eastern Massachusetts, as judged by the number of exhibits of this variety. Among newer kinds, the Haverland seemed to be the most deserving.

Mr. Fay showed specimens of Blonde Blockhead Lettuce of enormous size, surpassing, it is said, anything ever seen before in Massachusetts, although inferior to the Deacon Lettuce, sent by the same contributor, and which took the first prize.

Notes.

The third and final part of the "Provisional Host-Index of the Fungi of the United States," by William G. Farlow and A. B. Seymour, has appeared.

Mr. H. W. S. Cleveland, of Minneapolis, has associated with him, as an active partner in the professional work of landscape-gardening, his son, Mr. Ralph D. Cleveland.

Our correspondent, Mr. George Dawson, the assistant director of the Geological Survey of Canada, has been appointed a commissioner on the part of Great Britain to settle the Behring Sea controversy.

In reply to an inquiry from a correspondent, whose address has been mislaid, we would say that the parts of Hooker's "Icones Plantarum" cost four shillings each, and can be obtained from Williams & Nordgate, 14 Henrietta Street, Covent Garden, London.

The *Los Gatos* (California) *Mail* is authority for the statement that the manufacture of perfumes has begun in that town. One woman has a Rose-plantation of some sixteen acres in extent, besides Orange-trees, Acacias, Rose Geraniums and other plants bearing sweet-scented flowers.

The Hazel is not regarded in this country as a very valuable nut-bearing tree, and we doubt whether it is cultivated to any great extent. But it is more esteemed in Germany, as is shown by a pamphlet recently published at Berlin, in which the best methods of cultivating the Hazel are explained and a list of "eighteen chief varieties" is given.

An idea of the beauty and value of the new Japanese Lilac, *Syringa Japonica*, can be obtained from the fact that there is now a specimen in Mr. William B. Bacon's garden in Jamaica Plains, a suburb of Boston, only fourteen feet high, bearing one hundred and thirty clusters of flowers, many of them being from two to three feet long and eighteen inches or two feet broad.

The officer appointed by the State Board of Horticulture of California has seized 375,000 Orange-trees, just imported from Tahiti, because they are infested with different varieties of scale insects. They were intended for San Bernardino County, and if permitted to enter without being properly fumigated these insects would have spread throughout the choicest orange district in southern California.

The June issue of *Le Journal des Orchidées* contains an interesting and sympathetic notice of the late Paul Emile de Puydt, the distinguished Belgian writer upon horticulture, who died on the 20th of May last. He was a constant contributor to the horticultural press, and in 1860 published his *Traité de la Culture de Plantes de Serre Froide*. This was followed six years later by *Les Plantes de Serre*, and in 1880 by *Les Orchidées*, a work full of valuable information.

Among the newly introduced or still unfamiliar American plants recommended in the May number of the *Illustrirte Gartenzeitung* of Vienna are a brilliant orange-colored Coleus, Prince of Orange, which is declared to be the most splendid open-air sort yet grown; Nott's Excelsior Pea; the Remotant Pink American Flag; *Rhododendron occidentale*, from the Sierra Nevada Mountains; *R. Vaseyi*, of the Alleghenys, and the smaller and rarer *R. macrophyllum*, which is more commonly called, in Germany, *R. Washingtoni; Wistaria Chinensis floro albo*, a Chinese plant, but introduced into Germany by an American firm; four new Roses, Souvenir of Beauvoir House, Miss Winnie Davis, Miss Mildred Lee and Flor-Field (?); *Hibiscus Californicus*, and the Idaho Pear.

Monsieur Franchet describes and figures in the mid-June issue of the *Revue Horticole* his *Jasminum polyanthum*, discovered in 1883 by the Abbé Delavay growing in hedges in the neighborhood of Tarpin-tzé, a small town of Yun-nan, in China. This beautiful species, which Monsieur Franchet suggests will flourish in southern France, and possibly in regions of severer climates, is related to the well-known *Jasminum grandiflorum*. Its leaves, however, are much larger than those of that species, and of a different form, and the calyx-teeth are longer. It is remarkable in the great quantity of flowers which it produces in its native country, for the plant is not yet known in cultivation. The flowers are of a bright rosy flesh-color on the exterior and snowy white on the interior, and are possessed of the delightful perfume found in many species of the genus.

In his "Flora of New Bedford and the Shores of Buzzard's Bay," Mr. E. W. Harvey remarks that the favorite color of nature in that region is yellow in its different tints and combinations. In a number of species there are as many of a white or whitish color, but these are for the most part diminutive and inconspicuous. The various shades of yellow are more noticeable in spring, owing to the size and abundance of the flowers of a few common species, such as Buttercups, Dandelions, Potentillas, Calthas, etc., but there are really as many white-flowered species, though the flowers are smaller. Reds are not abundant at any time, but more common in the summer months. Purples are most frequent in August and September, when they rank next to the yellows, while the blues are more rare than any other color, and flowers of this hue are small in size, with the exception of the Iris, Lupine, Chicory, Aster, Pontederia and Gentian. The percentage of each color, computed by the number of species, is as follows: White, 33; yellow, including orange, 33; red and blue purples, 15; red, including crimson, scarlet and rose, 12; blue, 7.

Mr. E. S. Carman observed, on one of our recent hot days, that the Rose-bugs invariably sought the shade. Several of the beetles were then caught and placed in a paper box exposed to the sun. The thermometer in the box rose to 110 degrees and the insects died. Hot water was then tried, and it was found that the beetles were killed by water at a temperature of 125 degrees. The experiment was then made of heating water to 170 degrees and then spraying it upon some Magnolia flowers which were covered with the Rose-bugs. By the time the spray reached the insects it had been reduced to a temperature of 120 degrees, and it killed them without injuring the foliage or the flower. This experiment indicates that we may have a cheap and practicable check upon the ravages of this dreaded pest. It is plain that the nozzles which divide the water into mist are not the best for this purpose since the spray will hardly retain enough heat to kill the insects. A nozzle which emits coarser streams would be more effective, and it could be used at a greater distance. It is hoped that a trial will be made of this simple remedy wherever an opportunity offers.

We have received from Mr. Samuel C. Moon, of the Morrisville Nursery in Morrisville, Bucks County, Pennsylvania, flowering specimens of *Magnolia Kobus*, a Japanese species, which produces flowers before the appearance of the leaves, in early spring. Mr. Moon informs us that his specimen, which is now twenty feet high, with a straight trunk, about six inches in diameter, flowered for the first time in 1889, which is probably the first time that this species has ever flowered in the United States. It was planted by the late Mahlon Moon about twenty years ago, and was obtained it is supposed from Hovey & Co., of Boston, who had undoubtedly received it from Thomas Hogg, who, about that time, introduced many Japanese plants into the United States. The flowers of *M. Kobus* are smaller than those of *M. conspicua*, but they are pure white and very fragrant, and if the tree, with age, develops a free-blooming habit, it will prove a desirable addition to our gardens, as it is one of the hardiest of all Magnolias, perhaps the hardiest in eastern Massachusetts, where there are now several specimens of this tree raised from seed sent some years ago to the Arnold Arboretum from the northern island of Japan. None of these plants, which are now twelve or fifteen feet high, have yet flowered. *M. Kobus* was distributed in this country under the name *Magnolia Thurberi*, an unpublished nurseryman's name.

In view of the fact that the Hop plant-louse has appeared in alarming numbers in New York, Oregon and Washington, Professor Riley has prepared a bulletin which explains the main facts in its life-history and the remedies best known against its ravages. Since it was discovered a few years ago that the eggs of this insect were laid in the autumn on different varieties and species of the Plum, both wild and cultivated; that from these eggs were hatched in early spring stem-mothers of a dozen generations, and that the third generation of lice being winged desert the Plum-trees entirely and settle upon the Hops for their summer's work, it has become possible to devise an intelligent plan of attack. It is found: (1) That it will pay to spray the Plum-trees with some preventive application either in the spring, before the lice migrate to the Hops, or in the fall, after the lice have returned from the Hop to the Plum and are making preparations to lay winter eggs. The latter time is preferred, because in the fall the Plum-trees will be less susceptible to the action of poison, and stronger solutions can be applied without damage to the trees. (2) That all wild Plum-trees about the woods through the Hop-growing country should be destroyed. (3) That Hop-vines should be burned or drenched with a kerosene emulsion as soon after the crop is harvested as possible in order to kill the males. It is too late for preventive work of this sort this season, and the only thing now to be done is to spray the vines with some insecticide to kill the lice already there. Fortunately, the individual Hop-grower can be assured that his work cannot be thwarted by the carelessness of his neighbors, because the summer lice are wingless, and can only migrate by crawling from one yard to another. The bulletin goes on to state that the best insecticides for *Phorodon Humuli*, so far as known, are kerosene emulsions and fish-oil soaps. The proper method of preparing these mixtures, and the description of the best spraying apparatuses, have often been published, and they are repeated, with illustrations, in this bulletin.

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The Value of Rural Beauty.

A RECENT number of *The Press*, published at Ridgefield, Connecticut, contains an account of the settlement of West Mountain, and the narrative carries a lesson which could be profitably studied in many rural communities. The West Mountain district lies a few miles west of Ridgefield. It is a region of wooded heights and deep valleys, and, therefore, of sparkling rivulets and placid lakes, with many picturesque glens and sweeping views of diversified scenery. No doubt, the people who have lived within sight of West Mountain have always enjoyed its beauty, but it was a visitor from the city who was so profoundly impressed with the native charms of the place that he decided to make for himself a summer home in the midst of these sylvan surroundings. The first settler was followed by another and another, and now a single purchaser has secured a large tract with the intention of perpetually preserving it, so that the beauty of these natural hills and woods and lakes can be enjoyed forever. Now, it is a sordid view which estimates rural beauty solely by its money value, but it is worth while to remind the owners of real estate in the country that, even if rural scenery fails to make any moving appeal to their own sense of beauty, there are other people who do prize it. No doubt the purchase of this West Mountain land, which has been idle and practically valueless, will prove a substantial pecuniary advantage to all that neighborhood. Not only will it bring visitors and consumers of home products, but it will enhance the value of all the neighboring real estate, and every landholder thereabout will be the richer because of the discovery and development of this natural beauty, and of the assurance that it is likely to be preserved.

It is encouraging to know that in many other places there is a growing tendency to purchase so-called waste lands and to hold them for the enjoyment of the people. We call to mind another region in Connecticut where the villagers are united in their interest to preserve all the rural charms of the neighborhood. Miles of highway have been purchased with no other purpose than to allow Nature to frolic in her own free way by the road-side. Forests have been bought that they might be held for public enjoyment, and the feeling of the community is strong for the preservation of all wild spots which will help to satisfy the desire for beauty and repose. The state of New Hampshire has considered it worth while to recognize officially the value of its mountain-passes and ravines, its lakes and cascades, and to provide roads and paths for the purpose of making them accessible. All this indicates that every year there are more people who find pleasure and rest in the contemplation of natural beauty, and therefore there is reason for more earnest protest against the wanton marring of that beauty.

Of course, it is not meant that the axe should be kept out of every wood-lot or that every roadside should be left to wild vines and shrubbery. There is a beauty of cultivated fields and road-borders of trimmed turf, as every one will recognize who drives, for example, through the rich farm-lands of Lancaster County, in Pennsylvania. But no community lives up to its duty or highest privilege when it fails in solicitous care for the preservation and enhancement of the natural beauty which is its heritage. The destruction of a few venerable trees may turn a delightful piece of road into a dreary one; a railroad excavation may so gash a mountain-side as to destroy an entrancing prospect, and very often communities have no redress against such inflictions. But, where an alert public sentiment has been cultivated, a community is less likely to suffer in this way, for when it is known that rural beauty is prized as a public possession no one cares to fall under popular disapprobation for defacing it.

But sometimes more than a mere protection against damage ought to be possible. If it is a worthy purpose to conserve, so far as possible, and consistent with the demands of every-day business life, the beauties of a country, the endeavor to multiply and enhance these beauties is equally commendable. There is an art which doth mend nature, and if in all the planning and planting, as well as in all the clearing and general improvement throughout the country, the effect of what is done upon the surrounding scenery is studied—that is, if every proprietor of land should take constant thought about the landscape he is helping to make—the country would steadily grow in attractiveness. If every town possessed a man of taste whose counsel was listened to, village and farm-land, forest and orchard, might gradually shape themselves into pictures upon which the eye would delight to linger. Some one has said that society will not be regenerated by the landscape-gardener; but since a love for natural beauty seems to be an original instinct of the human soul, it certainly is wise to gratify this universal longing and cherish the beauty which lies about us rather than destroy it.

AT the recent meeting of nurserymen at Minneapolis, Mr. C. L. Watrous, of Des Moines, Iowa, took occasion to state a fact which is too often neglected in estimating the adaptability of trees in different regions of the country. What is known as "hardiness" means much more than ability to withstand a certain lowness of temperature. A tree, to be valuable in any situation, must be able not only to endure the cold of its winter, but the heat of its summer, and to endure these extremes for long periods. Besides this, the dryness or dampness of the atmosphere are to be considered as well as the liability to sudden changes in the way of moisture and temperature, with many more climatic complexities. Therefore it is often found that a tree which does fairly well in one situation may perish but a few miles away, and the only safe course is for every section of the country, and no very large section at that, to make its own trials, and find by

actual experience what trees can be planted with hope of success.

The fruit-growers of Iowa began to plant orchards years ago, and their work was full of promise; but disastrous seasons came and the orchards perished. Again they planted hopefully and largely of fruits imported from eastern Europe, where the climate was said to resemble that of our north-west. But here, too, there has been much disappointment, and many persons now believe that profitable orchards in the north-west are not to be found in importations from any different climate.

Some years ago, at a pomological meeting in Boston, there was an exhibition of fruit from every state in the Union, and a member of the Pomological Society from Iowa called attention to the fact that his experience at former exhibitions had been repeated at this one, and he ventured to say that it was always safe to expect that the premium specimens of any variety of fruit would come from a region near by the place of its origin. This statement was not altogether novel, but it impressed Mr. Watrous with the belief that the true way to provide fruits suitable to the north-west was to produce them from seedlings of the native sorts which had already proved themselves adapted to the peculiarities of the north-western climate. This belief is shared by many fruit-growers, and the work of producing native seedling fruits is now carried on with persistence and system in several of the north-western states. Mr. Watrous stated that in Iowa the State Horticultural Society had appropriated $2,500 each year and established twenty experiment stations, where fruits deemed worthy of trial are put under proper tests. Besides this, skilled men are employed to cross-fertilize fruits of various kinds. During the present year many hundreds of crosses have been made upon native Crab-apple trees, some of which already bear fair-sized fruit. The pollen is usually taken from such apples as Jonathan, Grimes, Northern Spy, Baldwin and other large apples of good flavor, late-keeping qualities, and preferably a red color. In the same way pollen is taken from European varieties of the Plum and used upon our native plants. The Sand Hill Cherry from the Dakotas has been planted, and is to be crossed with the best varieties of the European Cherry. The same is done upon our native Currants.

We are not aware that systematic attempts at improving fruits and adapting them to given conditions by cross-breeding has ever been tried on so large a scale in any other part of the world. It is certainly an experiment which all pomologists will look upon with interest. If we can ascertain some of the laws which govern the transmission of the specific qualities of given seed-parents, this would be a marked advance in the science and art of horticulture.

The idea of self-denial for the sake of posterity, of practicing present economy for the sake of debtors yet unborn, of planting forests that our descendants may live under their shade, or of raising cities for future nations to inhabit, never, I suppose, efficiently takes place among publicly recognized motives of exertion. Yet these are not less our duties; nor is our part fitly sustained upon the earth, unless the range of our intended and deliberate usefulness includes, not only the companions but the successors of our pilgrimage. God has lent us the earth for our life; it is a great entail. It belongs as much to those who are to come after us, and whose names are already written in the book of creation, as to us; and we have no right, by anything that we do or neglect, to involve them in unnecessary penalties, or deprive them of benefits which it was in our power to bequeath. And this the more, because it is one of the appointed conditions of the labor of men that, in proportion to the time between the seed-sowing and the harvest, is the fullness of the fruit; and that generally, therefore, the farther off we place our aim, and the less we desire to be ourselves the witnesses of what we have labored for, the more wide and rich will be the measure of our success. Men cannot benefit those that are with them as they can benefit those who come after them; and of all the pulpits from which human voice is ever sent forth, there is none from which it reaches so far as from the grave.—*John Ruskin, The Seven Lamps of Architecture.*

Bronx Park.

FEW people of New York know that within their city limits lies one of the most picturesque spots to be found this side the Adirondacks. Bronx Park is situated beyond the Harlem River, between Williamsbridge and West Farms, in Westchester County, and is about twenty minutes distant from the Grand Central Station. It consists of a strip some two miles long and half a mile wide, mostly wooded, on both banks of the little Bronx River. Altogether it comprises between 600 and 700 acres. In some places the river is a narrow stony brook, and in others widens out into placid sheets of water, surrounded with grassy knolls, shaded by tall, handsome trees. Very peaceful is the scenery, and the visitor finds no suggestion of a neighboring city beyond an occasional glimpse of a gray-coated park watchman and the shrill echoes of frequent steam-whistles.

The park is a portion of the outlying district annexed to New York in 1873, and, beyond taking down most of the old buildings scattered through the tract, nothing has been done toward improving or laying it out. Two or three highways cross it and a few pathways wind along the stream; the rest is left to the care of nature.

The native trees of this region are well represented through the park—Elms, Maples, Beeches, Birches and Chestnuts abound, five or six species of Oak, and, what is most surprising, quite a large grove of sturdy, healthy Hemlocks. Perhaps there are none of very great age, but many are good-sized trees, and what is most encouraging for the future, is the abundance of young ones. The Hemlock grove is the most picturesque part of the park, for there the Bronx winds through a narrow ravine, on the steep rocky sides of which the geologist will invariably point out some astonishing pot-holes. The botanist will not find himself alone in studying the banks of the Bronx; the artist will see many scenes worthy of his pencil, and even the archæologist will find there happy hunting-grounds, for an Indian grave-yard is close at hand.

In the beginning of May the fields and swamps were bright with spring blossoms. Violets were everywhere, white ones and blue ones, the latter going into astonishing vagaries as to color. On the marshy ground the common Blue Violet (*Viola cucullata*) was lilac with a slightly darker spot on the lateral petals; in the woods it was a nearly uniform blue-purple, and on the dry river-banks it was a deep red-purple, very large and handsome. Delicate little lance-leaved Violets (*V. lanceolata*) grow on the edge of the Hemlock-woods with dainty Wind Flowers, which we are now to call *Anemone quinquefolia!* Graceful Uvularias and the sturdy Jack-in-the-Pulpit, the green and the purple-striped form, growing side by side along the marsh and all through the woods, while higher up, in a secluded spot, the bright-green Indian Poke (*Veratrum viride*) is occasionally seen.

On the border of the marsh at Williamsbridge a row of Pin Oaks (*Quercus palustris*), covered with golden-brown tassels, presented a beautiful appearance. The lower branches of the trees almost touched the ground, and, at the water's edge, Sagittarias and their kin were just emerging from their winter sleep.

The pretty little lilac-flowered *Aphyllon uniflorum* was in bloom under the Hemlocks, and along the sandy stretches near the old Lorillard snuff works the curious wild Ginger (*Asarum Canadense*) covered the ground with its blue-green leaves. Witch Hazel grows along the mill-race of the old factory, and the graceful drooping clusters of the Bladder Nut (*Staphylea trifolia*) were reflected in a big pool overshadowed by lofty Hemlocks. The most striking bit of bloom was on the rocky bank near the Fordham road, where rose-colored Pinxter-flowers (*Rhododendron nudiflorum*), Black Haw (*Viburnum prunifolium*) and high, straggling Dogwoods were flowering. The Azalea was abundant and very luxuriant. Among the stones all about it was the pretty Columbine (*Aquilegia Canadensis*) and the wild Pink (*Silene Pennsylvanica*). Of Laurel there were only a few stunted shrubs, which bear the marks of very rough handling.

In 1639 one Jonas Bronck, a Swede, with his wife Antonia, a Dutchwoman, their servants and cattle, sailed from Amsterdam in the "Fire of Troy," and, on his arrival here, "purchased from the Indian sachem, Tackamack, and his associates the large tract of land called by them *Ranachqua*, lying between the Great Kill and the River *Ah-qua-hung*, now the Bronx . . . and since included in the Manor of Morrisania."* There "Seignior Bronck," as he was styled, built a stone house, tobacco-house, etc., and there died in 1643. After his death his estate passed through several hands till, in 1668, one

* "Harlem: Its Origin and Early Annals," by James Riker. New York, 1881.

Samuel Edsall conveyed it to "Colonel Lewis Morris, of the Island of Barbadoes, Merchant." At the death of the latter, in 1691, the whole estate, embracing 1920 acres, fell to his nephew, Lewis Morris, and was, in 1697, erected into the Manor of Morrisania.

Less than a century later, in September, 1776, General Washington established his headquarters, first at the country-seat of Roger Morris, and then at White Plains, his army being entrenched along the Bronx. It was on Chatterton's Hill, writes Washington Irving, that, by his skill displayed in the construction of earth-works, Alexander Hamilton, then a young captain of artillery, first attracted General Washington's notice. Of the battles of those days, along the Bronx, only tradition remains, and as the city extends the old landmarks quickly vanish. Even their names are forgotten in our fashion of neglecting points of historic interest in the nomenclature of city streets and squares.

Bronx Park has been selected as the site of the Botanic Garden which it is hoped the city will one day possess, and a more appropriate site could hardly be imagined. The river furnishes abundant water, and the varied soil and surface offers a rare opportunity for a fair piece of landscape-work.

The accompanying view on Bronx River is from a photograph taken by Mr. Charles G. Wood, junior, at a point below the Hemlock Grove.

New York. *Anna Murray Vail.*

How We Renewed an Old Place.

XII.—TERRACES AND SHRUBS.

THOUGH we have no especial preference for terraces, which used to form a feature of many old-fashioned homes, the conditions of our house-lot have forced them upon us on three sides. As I have before stated, the flat top of the knoll is very limited in extent, so that, even in building, we were forced to cut our coat according to our cloth, and support the rear of the house with a high basement to serve for laundry, dairy, and other offices, instead of adding the more usual L, or wing.

The width of the lot at this point would not allow of more than ninety feet between us and the highway, even by setting the building as far back as possible, and, when this was done, leaving a gentle slope from the front door to the road, the ground on the north and south sides of the house fell with such abruptness from the foundations that no room was left even for a passage-way.

This lack was remedied on the north of the house by constructing a terrace sufficiently wide on top for a tree or two, and some shrubbery to mask the foundations, with plenty of space for climbing things to grow over the veranda. This bank, supported on the east by the heavy wing-wall of the house, slopes to a driveway below, which leads to the stable behind. It is high and steep, but well sodded, and rather adds to the commanding effect of the house, besides serving to break the height of the building at the back. A flight of steps at the rear of the veranda leads to the drive below, and some good-sized Pines have been planted there to still further hide the basement.

The main approach was not planned with sufficient consideration for anything but convenience, and consists of a semi-circular driveway to make the house easily accessible from both ends of the town, but it is our plan to alter it before long, so that the front door will only be accessible from the north to carriages, which will give us an unbroken stretch of grass on the east and south, whereas now there is a half-moon of greensward in front, enclosed between the driveway and the street, thickly planted with trees destined soon to form an effectual screen between us and the dusty road.

South of the house, near the highway, the ground slopes gently into the swale, which, with its groups of trees, forms a side lawn of uneven surface, bounded at the rear by the hill, with its rising tiers of little Pines. Near the dwelling, however, in order to get any greensward or shade at all, we were forced to construct, of stones and gravel, a terrace some twenty-five feet in width at its narrowest part, to support which about two hundred feet or more of massive wall were constructed. This wall is low in front, and buries itself in the grassy slope, but where it curves around the knoll at the rear, it is six feet high, and makes a warm background for Grape-vines, and the hot-beds, which are placed below the vines, fronting the south. A steep bank, thickly sodded, descends from the level of the lawn to the top of the wall, which is also covered with turf. This sunny south terrace is the very spot for the old-fashioned Rose-bushes which we have transplanted hither from the other parts of the place, and here, too, is a bed for more delicate specimens, which can be protected by a glass frame in the winter-time, as well as a tree to shade the south windows from the heat.

The wall was quite an important construction, and I am afraid to say how many tons of stone went into it, for the largest portion of it is underground, the results being very solid and substantial.

Behind the house, on the basement-level, is still another curved terrace, from which a grassy cart-path leads down to the swale and the hot-beds, and here the various walls are utilized to protect rows of Currant-bushes above, and Raspberry-bushes below, which are easy of access from the kitchen-door.

To cover all this expanse of gravel foundation required untold quantities of loam, so much, indeed, that we thought ourselves fortunate if we could allow an average of four inches over the whole surface of the lawn, but this meagre allowance seems to afford sufficient hold for the grass-roots, and heavy annual dressings of compost add continually to its depth. It is rather a curious study to watch the formation of soil, and the gradual way in which the sand below is transformed by the roots—first into yellow, and then into black loam. How long, we wonder, will it take before a foot of soil is obtained over a surface treated as this lawn is treated, the fine grass dropped from the lawn-mower being left upon it without raking, and the drainage from the heavily enriched trees always helping it along, in addition to its own annual dressings?

The shrubs on the knoll, at first scattered about rather promiscuously, as they increase in size we are struggling to group properly, according to the lights thrown upon this subject by Garden and Forest, but the articles we have so carefully studied on this topic presuppose a great number of bushes of one kind to begin with, and where you have perhaps three Golden Spiræas, and a half-dozen Lilac-bushes, and a hardy Hydrangea or two, and a few Deutzias, and Weigelias, and other heterogeneous things in variety, the question is to set them so that they will produce the effect of twenty-five of each. We have managed it so that really the shrubbery appears rather crowded, but it has been done in a manner to horrify the authorities.

We have treated our landscape very much as a painter would his canvas. We dab in a shrub where we think it will produce the effect of half a dozen, and if, after a few months, the picture seems to require its removal, out it is scratched and dabbed into another spot, and thus, in true amateur fashion, we feel our way toward a final result, for we find things never look when they are little as they do when they are fairly grown, —the usual experience of amateur gardeners.

The best that can be said for this method is, that the results are unconventional. I have discovered that a landscape-gardener gets a style, a mannerism, like a poet or a draftsman, and that, after some experience, you can detect the professional manufacturer of a garden by the receipts on which he works. Twenty-five Spiræas here, twenty Deutzias there, Viburnums one dozen, Lilacs in variety, Forsythias eight, a bushel or two of golden Evergreens mixed with Juniper and Arbor-vitæ, at such a point, a hedge here, curves on this side, straight lines on that, etc., etc.—it is all reduced to a system, and the results, if repeated in the same town, are monotonous.

We are bound, having gone in for it, to defend the natural method. If the results of the artificial are more satisfactory, the execution is not half the fun.

Can there be, I ask you, the same enjoyment in sitting down to watch the growth of a border of shrubs that somebody has set out for you, that there is in dragging the few you have planted yourself, out of their holes and transporting them to a more becoming place, as you would a flower on a bonnet?

Anybody can put in a tree or a shrub and let it alone, but it takes nerve to wheel it about like a baby in a go-cart.

We have neighbors who employ the conventional methods with dazzling results, but, on the whole, we doubt if their vast and imposing plantations give them as much enjoyment as our more personal intercourse with our little family of growing things. We are quite sure that each scrubby little Pine on the hill is dearer to us than a thicket of well-fed trees planted by a nurseryman.

"You will know my children," said the Owl to the Fox, with whom she had made a compact to spare them, "by their being the most beautiful little darlings in the whole world." But when the Fox came to the nest full of big-eyed, long-billed, unfledged frights, he failed to recognize the description, and ate them all up under a misapprehension. *De nobis fabula.*

We are afraid that most people would pronounce in favor of the upholstering of the professional, rather than of our private efforts at lawn-furnishing, but we can recommend our

method on the ground of economy, both of material and of amusement, for there is no reason why this play should not go on forever, like a Wagner opera. It has its surprises too, in the way of some happy effect that you had not imagined, and again, you are horrified at the outcome of some arrangement that seemed felicitous. We have got our own shrubs so beautifully trained now, that they do not mind moving on the first of May, any more than an old New York citizen. Up they come, blossoms and all, and never drop a petal, but go on blooming serenely in their new home as if they had always been there. This spring we had a present from a kind friend of a box of rare and beautiful little shrubs, the very names of which it took a day to look up. We knew they were coming, but not what they were to be, so a bed was prepared for them within easy reach of the hose, and, when they came, they were set out carefully, in the midst of an April snow-storm, and a cold wind, which nipped their poor little half-opened leaves most cruelly.

After they were all arranged, and the weather had moderated sufficiently for one to study the labels, we found that the arrangement would have driven a gardener wild, future trees, a hundred feet high, having been set side by side with burly little shrubs, which at present look much more important than their (to be) stately neighbors. What with snow one day, and burning heat the next, combined with steady dry weather, those shrubs have had a struggle for existence, in which they have been sturdily abetted by their natural protectors. The hose one minute, and newspapers and branches of trees the next, have been called upon to supply the deficiencies of Nature, who has been more than ever capricious during this extraordinary season, and if at the end of the summer they are all well and firmly established, it will prove what care will do to defy the inclemencies of the season. After a year or two they will have acquired the customs of the place sufficiently to be moved where they will make the best show, but before they reach their final resting-place it is possible that they may have several halts by the way. With a ball of earth attached to the roots, traveling does not seem to hurt them much, though no doubt it retards their growth somewhat, which is all the better if they are to be kept in proper proportion to the place, which is not adapted to anything very gigantic.

Of one thing I have become certain in this limited experience of landscape-gardening, and that is, that the pleasure is in the doing, in the vision of the mind, in the ever-expanding hope for the future. When the trees have grown too large to move, and the shrubs are irrevocably rooted, we shall surely be no happier than now, when they are viewed in a halo of imagination.

Hingham, Mass. *M. C. Robbins.*

The Weeds of California—I.

IT might be unnecessary to begin a treatise on Weeds with a definition of the meaning of the word were it not that usage attaches to it two really distinct ideas, having in common only that of a hardy plant that is of no particular use. A weed in one sense bears the reproach of being a persistent invader of the husbandman's realm, difficult to repel; while in another it means simply a hardy plant thriving under difficulties which discourage more useful growths, and therefore obtruding its presence on road-sides and other waste places. It will hardly do to go so far as to attach the opprobrious term to any plant that habitually appears in a place where it is not wanted, despite the analogy of the "dirt" on the goldsmith's apron and the "pay dirt" of the placer miner.

It has not uncommonly been noted, as a matter of surprise, that the troublesome weeds of any country are rarely aborigines thereof. In reality this is probably but one of the phases of the survival of the fittest under natural conditions; for neither road-sides and waste places on the one hand, nor cultivated ground on the other, can be classed among such conditions. In order to become a weed a plant must be placed under unnaturally favorable conditions, unlike those which have naturally concurred toward the secular co-adaptation of plants, soils and climates. We see the converse process in the complete disappearance of native plants that have formed the predominant growth, as, for example, that of the Buffalo Grass (Buchlöë) from the plains of Nebraska and Colorado, not as the result of displacement, but of unsuitable conditions; while the Thistle on the Pampas, and the Guava on the Hawaiian group, are examples of almost complete displacement of native growth by foreign invaders. In California the progress of the invasion by some of the most common weeds can be currently traced as yet in the more remote regions; and the influence of climate in modifying the "weed nature" of a number of well-known plants forms an interesting study.

The broad fact in the premises that first strikes the newcomer in California is that a number of plants that are the subjects of careful culture east of the Rocky Mountains, as well as in Europe, and which quickly succumb when deprived of artificial protection there, are here found among the most persistent and obnoxious weeds; while very many of those that are specially abundant and troublesome in the Atlantic region are conspicuously absent on the Pacific side. Foremost among the former class are the two "Mustards," *Brasica Rapa* and *B. nigra*, respectively known as White Mustard (or Wild Turnip) and Black Mustard; and next to these the common Radish (*Raphanus sativus*, not *R. Raphanistrum* of the European fields). The first-named is most abundant on the borders of the Bay of San Francisco, and occupies not only abandoned fields, but disputes the ground with the cereals to such an extent that it is often difficult to believe that it has not been planted on purpose; and were rapeseed oil as much sought after as of yore California could doubtless lead the world in growing the plant which yields it. The Black Mustard is of more extended prevalence, and both in the coast region and in the great valley takes possession of neglected fields to the exclusion of everything else, growing so tall in rich soils as to hide horse and rider, and forming impenetrable thickets that, like the Thistle of the Pampas, serve as a place of refuge for wild animals. In the Santa Barbara region such Mustard patches are often cut for their seed, which is extremely pungent; but the crop often fails in consequence of the overwhelming attacks of an aphide upon the peduncles and forming pods. Apart from this latter drawback, California could probably also defy competition in Mustard-culture.

The Radish is not quite so overwhelming in its attacks upon cultivated ground; but large patches of its rose-colored flowers often contrast very prettily with the prevailing yellow of the two Brassicas; and the extirpation of its roots, equally tenacious in texture and life, and enduring several years, is no small problem in badly infested fields. Its habit would seem to indicate its derivation from some one of the long varieties of the cultivated plant.

Of cruciferous weeds the Hedge Mustard (*Erysimum officinale*) is somewhat troublesome at times, and the Shepherd's Purse is well acclimated, but hardly obnoxious. Of native crucifers the only one that maintains its place among cultivated crops with some tenacity is the *Tropidocarpum gracile*, which finds improved conditions of existence in the irrigated districts of the upper San Joaquin Valley. Of other cultivated plants that maintain themselves by road-sides and elsewhere in the open country in suitable ground the Celery, Carrot and Fennel are conspicuous. The tall and dense bushes formed by the last-named plant, even on well-trodden road-sides, recall the mention of Fennel-thickets, dreaded as the lurking-places of wild beasts, by travelers in the coast region of Asia Minor. The Fullers Teasel, likewise, has escaped from cultivation, and forms a serious pest in some places.

Of weeds conspicuous on the Atlantic side and almost unknown as such in California, the entire series of Polygonums is perhaps the most striking example, excepting only *P. aviculare*, which is probably more troublesome here than anywhere else, the rainless summers being nowise against its full enjoyment of life, and, in the prevailing absence of summer cultivation, enabling it to develop into gigantic wheel-shaped specimens, as much superior in size to their eastern brethren as are the proverbial California pumpkins. It is, however, a more or less acceptable pasture-plant for cattle during the dry season. By ditches and in meadows a few scattering plants of *Polygonum lapathifolium*, *P. Pennsylvanicum* and a few others are occasionally seen; but they do not maintain themselves and do not spread into the cultivated fields.

Of their near relatives, the Docks, however, there are several that count among the more troublesome invaders. While *Rumex sanguineus* and *R. obtusifolius* are hardly more often seen than are the Polygonums, three others—*R. crispus*, *R. pulcher* and *R. Acetosella*—are common and extremely tenacious of life, sprouting up from their roots, cut by the last cultivation in May, at any time during the dry season, and seeding quickly and abundantly.

Of Amaranths it may in general be said that they flourish in the fields of California as well, or even better, than on the Atlantic side, although somewhat changed in habit. *A. retroflexus*, as troublesome in California vineyards as among the Corn and Potatoes of the prairie states, forms here mostly a flat, wheel-shaped mass, from which the ground-squirrel, stooping down, gathers its winter hoard. *A. albus* maintains very nearly its eastern aspect.

Of Chenopodiums, *C. album* and *C. Bonus-Henricus* are almost, if not quite, as familiar as in the east and in

Europe; *C. vulvaria* likewise is found, but less generally diffused.

Portulaca oleracea, so common and troublesome in eastern and European gardens and fields, has appeared in a few localities, but, although doing well, has made no headway as a troublesome weed. The altered aspect of its fleshy leaves, which become much reduced in size, and almost terete, under conditions of extreme drouth, so that the thick red stems resemble a group of stout, radially disposed worms, suggests a marked adaptation to environments.

The native *Claytonia perfoliata*, although somewhat persistent among the grass in moister ground in spring, hardly maintains itself against regular cultivation, but its pretty relative, the *Calandrinia Menziesii*, does not give up so readily, and may be seen covering the ground in orchards and vineyards in the coast region, forming a beautiful carpet of purple that attracts attention from afar. Its vegetative duration is too short, and its root system too light, to render it troublesome, but the multitude of its shining black seeds render it difficult of extirpation.

University of California. *E. W. Hilgard.*

New or Little-known Plants.

Arbutus Arizonica.

THE Arizona Arbutus has long been a puzzle to the botanists, not many in number, who have seen it growing. Dried specimens, as they appear in herbaria, do not afford characters, except in their narrow leaves, by which to distinguish them readily. Indeed, except in the form of their leaves, several of the American species, in all of which the flowers and fruit are very similar, are not easy to separate in herbaria. The resemblance between the three species which are found in the territory of the United States is so great that Professor Gray at one time considered the Texas tree a mere form of the Pacific coast *A. Menziesii*, from which he did not distinguish our Arizona plant at all ("Syn. Fl. N. A.," ii., i., 27). Afterward he considered the Texas tree to be a variety of the Mexican *A. Xalapensis*, which he called var. *Texana*, and the Arizona tree another form, calling it var. *Arizonica* ("Syn. Fl. N. A.," ed. 2, ii., i., Suppl., 396). The Texas tree, which I have seen growing in several places in western Texas, including Buckley's original station, does not, however, appear distinct in any way from *A. Xalapensis*, as I understand that species after having seen it growing on the mountains near Monterey in Mexico, and in the series of specimens preserved in the herbarium of the Royal Gardens at Kew. As I know it, it is a low, wide-branching tree, with a stout trunk separating near the ground into a number of large, upright-growing stems. Near the ground only the trunk is covered with thick dark brown or nearly black deeply-furrowed bark, the surface of the ridges separating gradually into thin scales. The remainder of the trunk and the branches are covered with the thin, smooth, bright red bark peculiar to all the plants of the genus. The leaves are oval or ovate or rarely lanceolate-oblong, two or three inches long, rather thick and coriaceous, dark green above and sometimes pale on the lower surface. The ovary is pubescent.

The Arizona tree differs from the other species of the genus, as I know them, in the mature bark which covers the trunk and the lower parts of the principal branches, and which is as white as that of our White Oak and deeply furrowed, the ridges being broken by cross-fissures into thick square plates. The leaves are paler and much narrower than those of the Texas tree, although much reliance cannot be placed on the shape of the leaves of Arbutus, as they vary strikingly on the same plant, and even on the same branch. The character of the bark, which was the same on all the trees seen by Dr. Engelmann and myself on the Santa Rita Mountains, and the habit of the tree, which is that of a small Oak, appear sufficient, however, to distinguish this species which, if my views upon it are correct, will have to be called *Arbutus Arizonica*. It is apparently confined to the mountain ranges of southern Arizona; at least, Mr. Pringle has found nothing like it in northern Mexico, although he has been on the lookout there now for several years for all forms of Arbutus.

Arbutus Arizonica (see Fig. 54) is a tree forty or fifty feet in height, with a tall trunk eighteen inches to two feet in diameter, covered with white bark, stout spreading branches forming a rather compact round head, and stout tortuous red branchlets. The leaves are pale, lanceolate, or rarely oblong, two to three inches long and a third to nearly an inch broad, with entire or minutely denticulate margins, and are rounded or gradually contracted at the base into slender-grooved petioles sometimes an inch long. These, like the young shoots, are slightly puberulous when they first appear. The inflorescence is two and a half to three inches long, tomentose, with conspicuous scarious bracts. The flowers are rather smaller than those of *A. Xalapensis*, but otherwise not distinguishable from those of that species, except in their pubescent ovary. The fruit ripens in October, and is a quarter of an inch broad.

Arbutus Arizonica is found on dry gravelly benches and ridges between six thousand and eight thousand feet over the level of the sea, growing with *Quercus grisea*, *Q. Emoryi*, *Q. chrysolepis* and *Pinus ponderosa*, just above the region of *Pinus Chihuahuana* and below that occupied by *Pinus Arizonica*. It appears to have been first noticed by the late Dr. Thurber at the time of the Mexican Boundary Survey. Much later it was collected by Rothrock, Lemmon, Sargent and Engelmann, who first called attention to the character of the bark, Pringle, and Mayr. It grows in a region which is almost unsurpassed on this continent in the variety and interest of the trees which compose its forests—a region which will well repay more detailed study at the hands of botanists than it has yet received.

C. S. S.

Cultural Department.

Stray Notes from the Arnold Arboretum.—III.

SOMETHING was said in the last issue of these notes of the horticultural value of the two arborescent Cornels of eastern America, and now there is something to say in the same connection of some of the shrubby species, among which are to be found at least three or four excellent garden-plants, and possibly more, but nothing is known yet of the behavior of the California species in cultivation.

By far the most beautiful of our shrubby Cornels is *Cornus circinata*. This is a plant of northern woods, in which it grows in rich and in sandy soil or on rocky banks and hill-sides from Nova Scotia to Dakota, and through the hilly and higher parts of the northern states and along the mountains to Virginia. It is not a large plant, and produces rather rigid erect stems rarely reaching the height of ten feet and covered with smooth dotted bark, which is at first pale green and later becomes light brown or purple. The leaves are perhaps the most beautiful thing about this plant; they are large for the leaves of a Cornel—four or five inches long and three inches or more broad—elliptical and long-pointed. The color of the upper surface is yellow-green, while below they are bluish white or steel colored and covered with short soft hairs. The coloring of the leaves of few shrubs is more striking and beautiful. The flowers appear rather early among those of the Cornels and at the very beginning of June; they are produced in rather small, flat cymes, like the flowers of most of our species, and are small and yellowish white. The fruit is more beautiful than the flowers. It is spherical, as large as a pea, bright blue, and very conspicuous for the size of the clusters. It ripens early in the summer. This has always been a favorite plant in the Arboretum, and has been used in considerable numbers through the shrubberies and along the drives. A few years ago it was only the botanists who knew or cared anything about our Cornels and many other native shrubs, but now landscape-gardeners and nurserymen are beginning to find out their value, and Cornels and Viburnums appear in this vicinity not only in public gardens and parks but in small villa gardens as well—a hopeful thing, perhaps, as indicating that garden fashions in this country are working out of the old ruts and that the popular knowledge and appreciation of plants is broadening.

Ten years ago, in this neighborhood at least, the list of shrubs one found in the majority of villa gardens, was a very

short one indeed, all the horticultural efforts of such establishments being devoted to securing during a couple of months in summer a glaring display of tender bedding plants. Now many of these gardens contain large collections of shrubs often tastefully grouped and arranged, while the use of hardy perennials has also increased. It is interesting to trace the influence of the Arboretum in this increase in the popular knowledge of hardy plants and to find that some of the most popular shrubs in the gardens of the northern states were first raised and cultivated in this country by Mr. Dawson a very few years ago.

surface; they are yellow-green above and pale on the lower surface. The flowers make their appearance late in May or in the early days of June, and are produced in rather small, flat and few-flowered clusters. The fruit, which grows rapidly, ripens in July, and is white or lead color, but not very showy or handsome, as the color is dull, and only a few fruits ripen in the clusters. The color of the branches in winter is the most ornamental thing about this shrub. They are bright red purple, especially the portion produced during the previous summer, and make this plant a conspicuous and interesting object. At the season of the year it is stripped of its foliage, and

Fig. 54.—Arbutus Arizonica.—See page 317.

But the remembrance that the Cornels, like so many other native shrubs, were first cultivated in the Arboretum on a large scale has carried us too far away from the consideration of the individual value of the species. Another of the early-flowering Cornels is the so-called Red Osier Dogwood, *Cornus stolonifera*, so named on account of its habit of spreading and multiplying freely by prostrate or subterraneous shoots. By these, if the plant happens to find itself in the deep, rich, wet soil it delights in, it soon forms great broad clusters of graceful branches, six or eight feet tall. The leaves are lanceolate or ovate, and vary considerably in size and shape on different plants, and in the amount of pubescence which clothes their

interest and variety in the composition of gardens and shrubberies is often lacking, a plant of this Cornel lights up a whole shrubbery, and makes, when seen against a background of snow, a bright spot upon which the eye delights to rest. No other plant is so well suited to produce this sort of effect, with the exception of an Old World Cornel, closely related to *C. stolonifera*, which shall be mentioned a little later, when we come to speak of the foreign species. *C. stolonifera* is a northern plant, and loves a cold climate and moist soil. It grows in the east, from New Brunswick as far south as the Potomac, and extends along the shores of the Great Lakes far into British America and

ranges southward, on high mountains, to Arizona and New Mexico.

The panicled Cornel is another species which has been planted in the Arboretum in large numbers and with good effect. This, in most works on botany, appears as *C. paniculata*, but Humphrey Marshall's name, *candidissima*, is older, and has been adopted by Professor Coulter in his recent monograph of our Cornels, and it is by this name that the panicled Cornel should be known. It is a good name, as botanical names go, for the flowers, although they are certainly not pure white, are whiter than those of the most of the species. The clusters are loose and convex and often panicled, and are produced in the greatest profusion along the branches, making this the most beautiful of our shrubbery Cornels at the time when it is in flower. The flowers open here about the middle of June, and, late in the summer, are followed by rather showy clusters of white fruit. *C. candidissima* is sometimes almost tree-like in habit and in the height to which it grows. The branches are erect, slender, very numerous, and sometimes nearly twenty feet tall, and are covered with smooth, gray bark and abundantly supplied with narrow, not very large, pointed pale leaves, sometimes green on the two surfaces and sometimes pale below. This plant grows on the banks of streams and in moist situations, where it often forms extensive thickets; it is one of the most common and widely distributed of all our Cornels, being found from Nova Scotia and Florida to Minnesota and Texas. It abounds in the south, where it replaces *C. stolonifera*, and, in some parts of the country, is one of the most common and conspicuous roadside plants where roads cross streams or low wet places. It will thrive, however, in any good garden-soil, and adapts itself to new conditions to which plants in the gardens often have to submit.

The Silky Cornell (*C. sericea*) is the last of our species which has been grown in the Arboretum in large numbers. This is a variable plant in general appearance and in the size and coloring of its leaves, and it is not at all improbable that two or more distinct species can be made out from what has been usually considered *C. sericea*. This plant has the merit of flowering at the very end of June and in the early days of July, that is when most shrubs have passed their time of blooming, and the best effects in the shrubberies at the Arboretum at this time are produced by the great masses of this Cornell, which have been used along the drive-ways. The flower-clusters are not large, and the flowers are yellow rather than white; they are produced, however, in the greatest profusion, while the habit of the plant is excellent with its long graceful branches, which, when it is given sufficient room in which to grow, spread out over the ground and form great masses of foliage fifteen feet or more across. The foliage is almost orange-colored in some forms and pale in others, and the leaves, like the slender, graceful purple branchlets, are covered with soft silky hairs. *C. sericea* likes moist soil, and shows its greatest beauty when planted in such a position that it can hang its long graceful branches over a brook or decorate the margins of a pool. It flourishes, too, if it happens to be planted in dry soil, although, unless the conditions favor it, it will not show its greatest beauty.

C. asperifolia, another native species peculiar to the central and southern parts of the country, is grown in the Arboretum, but not in large numbers, and enough is not known about this plant in cultivation to make it desirable to say much about it as a garden-plant. It is a tall, erect-growing and rather distinct-looking shrub, with reddish brown branchlets, narrow leaves, small flowers and showy white fruit produced in red-stemmed clusters. It is a hardy plant, but not distinct enough to be very valuable probably in the garden, except as a curiosity, or worth planting on a large scale if the other and better-known species can be obtained.

These notes have reached the limit the editor has set for their length, and the consideration of some exotic Cornels must be postponed for another issue of the series.

Arnold Arboretum. *P. C.*

Notes from the Harvard Botanic Garden.

Anemone sylvestris.—The "Wood Anemone," or "Snowdrop Windflower" (the latter name given on account of the drooping habit of the flower-buds and flowers), is one of the most useful and beautiful of the spring-flowering Anemones. It is a native of continental Europe, and has long been cultivated in British gardens. The shining green, ternate leaves are borne on slender petioles, which proceed from the root and are from five to seven inches in length. The divisions of the leaves are cleft and serrate. The pure white flowers, one and a half inches across, with broadly elliptical petals slightly incurved, and a cushion of greenish white pistils encircled by a showy band of bright yellow stamens, are borne singly at the top of a slender, but erect, stem, which often exceeds a foot in height. The leaves of the involucre are borne on stout stems from one to two inches in length, and, although smaller, they bear a strong resemblance to the root-leaves. The plant blooms very freely in May and June, and the flowers are effective, and, for Anemones, last well when cut. It is an excellent plant for the herbaceous border, but is seen to the greatest advantage when planted in clumps on the outskirts of shrubberies or naturalized in irregular patches in shady groves or "wilderness gardens." It will grow in any ordinary soil, but does best in rich loam. The roots are easily divided in autumn, and the plant can be propagated in this way. Seeds ripen freely in this climate, and they are ready for gathering about the latter part of June or early in July, and may be sown immediately with advantage.

Clematis recta.—Among hardy plants, this herbaceous species ranks with the best for garden decoration. It is native in various districts of south Europe, and was first introduced to English gardens from Austria in 1597. A variety peculiar to Spain, *C. recta*, var. *Hispanica*, differs but little from the type, and was introduced in 1800. The species is a plant from four to five feet high, forming a compact mass of growth, the stems terminating with a large, much-branched cluster of small creamy-white flowers, fragrant and packed together in close order. Large, established plants are very effective at the back of an herbaceous border among such things as the Oriental Poppy, *Thermopsis Caroliniana*, *Baptisia tinctoria*, the tall-growing Delphiniums and *Achillea filipendula*, var. *filicifolia*, throughout the month of June. *C. recta* seems to thrive better and flower more freely in a soil of medium fertility. It will live in partially shaded situations, but the most luxuriant plants are found in full sunshine. Old plants should not be disturbed so long as they remain in a healthy condition; and while propagation may be effected by dividing them, it will be found more satisfactory, if a trifle slower, to increase the stock by seed, which is borne abundantly.

Corydalis nobilis.—This is a charming plant for shady positions in the rock-garden and mixed border. The erect, angular stems grow to a height of twelve or eighteen inches, and are furnished with glaucous, bipinnate leaves, which have a very elegant appearance. The flowers are clustered in a dense terminal raceme, and an acute green bract appears at the base of each pedicel. The two outer petals gape, and are of a showy yellow color at the tip, while the other two are smaller, tipped deep brown, and united so as to form a covering for the reproductive organs. The petals terminate at the base with a hollow spur of greenish white. It is to this spur that the generic name refers. The plant is a member of the Fumitory family, and Corydalis is derived from the Greek name for the lark. The spur of the flower, it was imagined, bore some resemblance to that of the lark. This plant flowers profusely in May, and it delights in a free rich loam. When planting in the rock-garden avoid dry positions; they are dangerous, and not infrequently the cause of death. *C. nobilis* is a native of Siberia, and was introduced by a Mr. John Græfer in 1783. Propagated chiefly by division, but it may also be readily increased from seeds when they are obtainable.

Heuchera sanguinea.—A little tuft of this "Alum Root," which was risked to all the rigors of the late winter, is now in full bloom. This fact, taken with the notes of other cultivators in various parts of the north-east, proves that this excellent plant is, beyond all doubt, hardy as far north as Boston at least. Few plants of recent introduction have attracted such wide-spread attention, and the number of those as well worthy of cultivation is still smaller. It was introduced from Mexico about ten years ago, and the exertions of propagators were rewarded by rapid distribution in Europe. The demand for the plant is still strong across the ocean, and it now finds a ready sale in this country. The uncertainty as to its hardiness was the principal cause of the neglect which it has hitherto suffered from American growers of hardy plants, but it is likely to receive ample attention in future. The plant forms a close mass of pale green lobed leaves, the entire cluster of foliage being about eight or nine inches high. The erect, loose panicles of bright salmon-red flowers attain a height of from eighteen to twenty-four inches, and are produced in large quantity. When in bloom, in established masses, the plant is a never-failing source of gratification. There are, at the present time, many more striking hardy plants in bloom, but certainly none more pleasing. This Heuchera thrives best in a

light and moderately rich soil. The best situation is one where the roots will be moderately dry in winter, and which affords moisture and partial shade in summer. Propagate by dividing the plants early in the season before growth commences.

Ranunculus aconitifolius.—This is a native of Europe, and was introduced in 1596. It is a hardy herbaceous perennial, from twelve to eighteen inches high, and of profuse branching habit. The flowers are small, white and single, but they appear in great abundance. It is seldom found in gardens, but the variety known as *R. aconitifolius flore pleno* is a popular plant. This was introduced about the same time as the species, according to Loudon, but Gerard informs us that it was not known to be wild anywhere in his time. At all events, it has long been a favorite among hardy border plants, and is invariably met with in those rare old-fashioned gardens kept by really old-fashioned people in parts of England and Ireland. They would hardly know it by such a name as *R. aconitifolius*, however, being satisfied with such simple names as "Bachelors' Buttons" and "Fair Maids of France."

Fig. 55.—A View in Bronx Park, New York.—See page 314.

Masses, about a yard across, intermixed with similar masses of other plants, are more effective than those of larger dimensions. Occasional clumps on the verge of a shrubbery have a pleasing effect, and the flowers are among the best that can be used for cutting.

Cambridge, Mass. *M. Barker.*

Carnivorous Plants.

Cephalotus follicularis.—This new Holland Pitcher-plant, though by no means new, is infrequently seen. It is perhaps the oddest member of the Saxifrage family, because it produces leaves of two very different forms on the same plant, some being simply elliptical and flat, while the others consist of tiny pitchers very similar in shape to those borne by some of the Nepenthes. The pitcher-leaves are usually from one to two inches in length and are produced on short stout stems, the color, which varies widely in different plants, being green, much marked and shaded with brownish red or chocolate. The total height of the leaves is seldom more than three inches, although the flower-spike, if permitted to develop, is a few inches higher. The flowers, however, possess comparatively little beauty, and their development is not recommended, because they weaken the growth of the plant, and the pitchers, its chief beauty, are therefore apt to be smaller.

Cephalotus follicularis is the only species of the genus, and is a cool-house plant which delights in moderate shade and abundant moisture. It grows well in a soil of rough peat, sand and living sphagnum, and the pitchers nestle in the moss. A moist atmosphere is so congenial to it that it will thrive under a bell-glass. The propagation of Cephalotus is effected by division of the crowns, by seeds, and also by means of root-cuttings, the latter being probably the most satisfactory method, providing proper care be taken of the cuttings. This plant was introduced from Australia some seventy years ago.

Dionæa muscipula.—As a companion plant to the Cephalotus, the Venus Fly-trap, or Dionæa, is very interesting, and the two plants will give an opportunity, in a small space, for the study of so-called carnivorous plants, and both are charming little plants, without taking into consideration their digestive possibilities. The Dionæa will flourish under the treatment recommended for the Cephalotus, and, like the latter, it is benefited by the removal of the flower-stems before they are fully developed. Dionæa is also a monotypic genus, and is found in swampy ground in a few localities near the Atlantic coast, in North and South Carolina.

Further interest may be added to the collection by the addition of some of the Sundews (Droseras), to which Dionæa is allied. Among the native species *D. rotundifolia* and *D. filiformis* are the prettiest, while, among the many species of foreign origin, *D. binata* and *D. spathulata* are notably good, and deserving of cultivation.

All of these plants may be grown in quite small pots—a good plan being to plunge several pots in a pan of moss or sand, by which means it is easier to keep them moist during hot weather.

Holmesburg, Pa. *W. H. Taplin.*

Garden Edgings.—Four days before Mr. Gerard's article on this subject appeared in Garden and Forest (page 298), the *Gardeners'* (London) *Magazine* contained the following note: "Many kinds of edgings may be put down in gardens to divide beds or margin walks, although the man who only uses tiles and brickbats thinks that plants should not come into consideration. The perpetual use of Box, clipped into painful regularity, is almost as tiresome as glazed tiles; but I allow of none of these in my own case. One long walk is edged with Gentianella, which has formed a perfect mat-like growth, enriched with the profound blue flowers; another formed of Saxifrage, and the others of Stonecrop, Arabis, or lovely herbs of dwarf growth. One of the principal walks is margined with soft stones, having Stonecrop, Saxifrage, etc., planted between delightful rock things that soon cover the stone with a velvety carpet, studded in spring by flowers. The Armeria deserves a special note. It is one of the best edging plants that may be used, growing luxuriantly, and presenting at this season a surface of rosy flowers, rising up with great regularity. The Thrift, or Armeria, remains green throughout the year, but needs attention about once in two years, when the whole should be lifted, the tufts divided, and replanted in light loamy soil, well mixed with silver sand. Visitors here think the edgings of Thrift worth a journey to see, and I send this note in the hope that those who have not tried it, or the other kinds of edging mentioned, will do so."

Spiræa gigantea, said to be a variety of *Spiræa Kamtschatica*, is a plant of noble port, with very large palmate leaves on stout erect stems. The flowers, which are produced freely in large racemes, are attractive and, on first opening, of a creamy tint, changing to a pure white. In rich, deep, wet soil it is said to grow seven or eight feet high, but on the border of my tank, in somewhat heavy soil, it flowered about the middle of June when five feet high. It promises to be a good plant to establish on the margin of water where a bold effect is desired, since it is distinct and larger in all its parts than our common Meadowsweet. Like most of the herbaceous Spiræas it soon turns rusty after flowering, so that it is not a desirable plant for a small garden or prominent location.

Elizabeth, N. J. *J. N. Gerard.*

Correspondence.

The Naturalization of Exotic Forest-trees in Prussia.

To the Editor of Garden and Forest:

Sir,—Ten years have now passed since the Prussian Government undertook the cultivation, on a large scale, of a considerable number of exotic forest-trees, principally American, with a few also from Japan. This period, although a short one in comparison with the life of individual trees, seems to have satisfied the authorities, in a certain degree at least, as to the feasibility of the undertaking. There is nothing novel in this experiment, because similar ones were made here during the last century; but in our age more persistency and method are used in carrying out such trials. Americans who take a friendly interest in their vegetable compatriots in a foreign country will be glad to hear, perhaps, of some of the results which have been obtained with them in this country. It is safe to say in general terms that this new departure in German sylviculture has been successful. The success is due principally to Mr. Lucius de Ballhausen, late Minister of the Interior, seconded by Forest-master Danckelman, of the Academy of Neustadt Eberswalde.

The list of species tried at first was large, but has now been greatly reduced, and only includes those trees which seem to be the most promising, the forest-administration being determined to confine itself to testing thoroughly only the most valuable trees which up to the present time have proved themselves best suited to flourish in the climate of northern Germany; and in the future these species only will be cultivated on a large scale. The purpose of this note is to give some information with regard to these trees gathered from recent publications of the Forest Academy, the most important of these being a pamphlet from the pen of Professor A. Schwappach, entitled, "Denkschrift betreffend die Ergebnisse der in den Jahren 1881-90 in den Preussischen Staatsforsten ausgeführten Anbauversuche mit fremdländischen Holzarten."

The department, between 1881 and 1890, distributed an immense quantity of the seeds of trees furnished almost entirely by our distinguished countryman, Mr. John Booth, formerly proprietor of the celebrated nurseries at Flottbeck. The appropriation for the purchase of seeds being now exhausted, efforts will be confined for the present to a study of the growing plantations. These are considerable, and occupy in the forests of the state alone a surface of ten or twelve hundred acres. Experiments have been made with twenty-two American and six Japanese species, as well as with *Pinus Laricio* of Corsica and Nordmann's Fir of the Caucasus. The experiments will be continued on a large scale in future with the following selected species only: *Pseudotsuga taxifolia, Picea Sitchensis, Chamæcyparis Lawsoniana, Thuya gigantea, Quercus rubra, Juglans nigra, Hicoria ovata, Hicoria minima.*

A second class, composed of trees which promise only a partial success, is reserved for less extended trials. It is composed of the following: *Pinus rigida, Juniperus Virginiana, Abies Nordmanniana, Pinus Laricio, Acer barbatum, Betula lenta, Hicoria alba, Hicoria porcina.* The following trees have been rejected entirely: *Pinus Jeffreyi* and *P. ponderosa, Acer saccharinum* (*dasycarpum*), *A. macrophyllum, Hicoria sulcata, Fraxinus pubescens.* In place of the last it is now proposed to try *Fraxinus Americana.*

Of all the new introductions which, as you have noticed, consist principally of conifers, the Douglas Spruce appears destined to occupy the first place. Nothing but praise is heard for it. The seed of none of the other exotic trees has been distributed so generally and so profusely in all parts of the country, from the north to the south, and none of the others has given such brilliant results. Immense quantities of the seed of this tree are now planted in all parts of Germany, and the supply is not commensurate with the demand. This splendid tree, therefore, has the best chance, if not of replacing our indigenous conifers, at least of placing itself on a par with them in the composition of our forests. Its success seems to be assured in all parts of the kingdom, even in the provinces of the north-east, where the cold is extreme. Not particular as

to soil, it thrives everywhere except in low peaty swamps and on the moving sands of our maritime provinces. The Douglas Fir is one of the best presents which have been made by the New World to Europe. The publication to which I have referred devotes itself especially to discussing the differences between the so-called Red and Yellow Firs, races which seem to mingle in this country in the general success of the species.

The Douglas Fir has for a close second the Sitka Spruce, which is also very promising, although it grows less rapidly than the Fir; and we expect to see this tree of the Pacific coast occupying some day or other immense tracts of the German forests, especially in those peaty soils where the Douglas Fir refuses to flourish.

Lawson's Cypress, that ornament of gardens, is valued for the solidity of its wood and for the ease with which it adapts itself to soils of the most variable character. What I think will surprise you is the hardiness of *Thuya gigantea* in the extreme north, even to the very confines of that eastern Prussia which at Berlin has come to be considered the vestibule of Siberia. It is needless to say that, as it flourishes in that inhospitable region, the parks and gardens of Brandebourg, in a more temperate climate, are now enriched with the tall stems of this superb plant, which passes uninjured our most severe winters. Even this last one of abnormal severity and length has not affected it in the least.

Pinus Jeffreyi and *P. ponderosa* have been struck out from the list of trees available for planting in the neighborhood of Berlin, although there is still some hope that *Pinus rigida* may succeed here, this being the species which was believed to furnish the pitch pine of commerce, which is, however, probably produced by *Pinus mitis* or by *P. palustris*. That this communication may not be too long, I must not speak in detail of all the species which have been tried. The Black Walnut and the Hickories rarely find here soil suited to their needs, while the Red Oak succeeds admirably. This last, however, has been naturalized here for a long time, its introduction dating from 1740. Up to the present time, however, it has been grown as an ornament of gardens, and not as an inhabitant of forests.

I cannot leave this subject without expressing my thanks to Mr. Schwappach for his admirable essay upon the results of these forest-experiments. I shall take an early occasion to speak of the results of the experiments with Japanese trees in Prussian forest-planting.

Berlin. *C. Bolle.*

Irish Daffodils versus Dutch in the New Country.

To the Editor of Garden and Forest:

Sir,—I was pleased to see what is said about the successful cultivation of Daffodils in Garden and Forest. I should add, as a European and one who grows bulbs by the thousand, do not depend for bloom on rich, over-fed bulbs that look plump and heavy. Rather select smaller bulbs that are properly ripened, with flower-buds well set in them. Where there is a lot of green unripe wood on a plant, it means a lack of flowers. Where there is a lot of dense foliage on a Daffodil-bulb produced by over-feeding, the same rule holds good. The overfed bulb never gets properly ripened. It keeps growing, making leaves instead of bloom, and when it settles down to rest is too often dug from necessity in a thoroughly green state. This applies to Daffodils such as Trumpet Major, Trumpet Maximus, Spurius; with Bicolor Horsfieldi, Emperor, Empress, Sir Watkin, etc., that produce large broad leaves, the larger the bulbs and better fed they are the better. But with all the Spurius class, Princess, Trumpet Major, Von Sion, etc., the hard, dry, well-matured bulbs, grown without stimulants of any sort, are best. For experiment I procured four bulbs of Princess from Holland, which were beautiful to look at. In fact, they were originally Irish bulbs, grown three years in Holland. I planted them side by side with small bulbs of the same stock grown in Ireland. The result was one flower each on the fat Irish bulbs, pampered by a Dutch expert for three years, and two and three blooms each on smaller-looking stuff kept and grown on in their native soil. Holland can grow Tulips, Hyacinths, Crocus, Anemones and Ranunculus better than any nation in Europe; it never can grow ordinary Daffodils with the south of England or Ireland. It has not the soil. Sand answers well. But to grow Daffodils to perfection you must have the command of good hazel loam and ample drainage during the resting period.

The crop of bloom does not come in Holland until April. In the south of Ireland the flowering season is late February and March. If bulbs flower early under good conditions they ripen early, can be planted early, and will bloom early.

Cork, Ireland. *John Quill.*

Recent Publications.

A Manual of Forestry, Volume II. *Formation and Tending of Woods, or Practical Sylviculture.* By William Schlich. London: Bradbury, Agnew & Co., 1891.

The first volume of this manual appeared in the autumn of 1889 and was reviewed at length in these columns by Sir Dietrich Brandis, the former head of the Indian Forestry Department. That volume dealt with the question of the general utility of forests, and, in part, with the fundamental principles of sylviculture. The present volume describes the practical application of those principles, with a description of various trees, with special reference to their adaptability and value for cultivation in Great Britain. Practical sylviculture, as Mr. Schlich defines it, is the production of woods or forests —that is, all the operations connected with the formation and care of woods until the trees which compose them are ripe for the axe. The principles which guide the forester in this business were explained in the first volume of this manual, and all that is left for the author to accomplish in the present installment of this important work is to explain the practical application. The subject he divides into their following chapters:

Preliminary Works, under which head Dr. Schlich treats of the choice of species, the question of fencing, and the preparation and reclamation of the soil. In his second chapter he treats of the formation of woods either by artificial or natural means. The third chapter is devoted to the care of the woods after they are planted, while in his fourth chapter the author sketches in the form of notes the economic value of various forest-trees.

Mr. Schlich very properly points out that the success of all forestry operations depends primarily upon the judicious selection of the species of tree which is to be grown under a given set of conditions; and this, we may remark, applies not only to forests planted primarily for the production of timber, but to all plantations for whatever purpose they may be made. Mistakes made in the selection of species to be planted can be rectified only after a considerable lapse of time. Many species, as we know to our cost in this country, where we are only just beginning to learn that the Norway Spruce and the Scotch and Austrian Pines are worthless here, thrive well for a series of years, and only commence to fail after twenty, thirty, or even after a longer period. The entire success of any species in any given locality is dependent on many things besides hardiness. A species possesses greater or less value in proportion as it can be adapted to desired systems of sylviculture, as it may possess, in a greater or less degree, power to preserve or improve the fertility of soil and capacity to resist damage from external causes. Not only must the value of the products of any species have its proper weight in causing the selection of trees to be planted on a large scale, but the matter of the improvement of the soil through planting is one of vital importance which cannot safely be overlooked, as in it lies the germ of the whole theory of profitable sylviculture. Unless land which is covered with trees improves from year to year and from century to century by the action of these trees, some mistake has been made in their selection, and any system of sylviculture which does not improve the condition of the soil has not been wisely selected and developed.

In the chapter on the formation of woods, directions are given for sowing, for selecting and testing seeds, for the formation and management of germinating or seed beds, for methods of sowing, whether broadcast or in patches, or in trenches or pits. The section which treats of the quality of the plants we are glad to reproduce entire, because there is no department of planting in which planters in this country so often fail as they do in this particular.

"The success of planting operations," the author tells us, "is governed by the quality of the plants which are used, just as the success of direct sowings depends on the quality of the seeds. Hence only healthy vigorous plants should be used, which are likely to bear well the interruption of growth involved in the transfer from one locality to another under circumstances admitting only of a limited amount of attention being paid to each plant. The vigor or growing power of a plant is indicated by a normal shape and a healthy appearance.

"The development of each part must be in due proportion to the rest; the plants should be neither tall and thin, nor too short and stout; nor should the stem be crooked, especially in the case of coniferous plants; the root system should be ample, with a fully developed system of rootlets; the crown should have a healthy green appearance and possess numerous well-developed buds. These are the general characteristics of good healthy plants."

These sentences may well be read by many persons in this country who have charge of planting our public parks, in which it often happens that crooked, distorted and half-dead trees and worthless shrubs are set. Such plants never produce desirable results. The cheapest and best thing to do with such plants is to put them on a brush pile. It is certainly a waste of money to plant and cultivate them. There is no branch of American horticulture which now needs reform so much as in the quality of nursery-grown ornamental trees and shrubs as usually offered for sale. Nurserymen, of course, will continue to sell poorly grown plants as long as purchasers can be found for them, and a reform in this direction will not come until purchasers know what a good plant is, and what it is worth. When this time comes they will be willing to pay what it costs to produce a well-grown, well-rooted and well-pruned shapely plant. The character of the material which is being planted in some of our cities under the direction of park commissioners and landscape-gardeners is not a credit to the existing knowledge of tree-planting in this country, and we are glad of the support of so eminent an author as Dr. Schlich on this subject, which is one of very considerable importance, as a bad tree, once planted, will, unless it has the good fortune to die, continue bad until the end of its life and remain a daily proof of bad methods.

We are glad to quote, too, the sentence that, "as a general rule, young plants are best because the operation of planting is cheaper. The plants survive more easily the interruption of growth involved in the change, and they adapt themselves more readily to new conditions." These are sound arguments against the prevailing notion that it is better to plant large plants than small ones.

Persons who desire to plant on a large scale will find in this work a detailed account of all the methods necessary to follow in planting forest-trees in the most economical manner, with descriptions of the tools used, and such other information as will enable them to carry out sylvicultural operations successfully. They will find, too, a clear account of the systems employed in Europe in renewing woods by the natural process, with suggestions for the application of these rules in particular cases. We should be glad to describe these methods more in detail, but the want of space compels us to refer the reader interested in such subjects to the book itself, which has the exceeding merit of being written in plain and simple English, and in a style which makes it perfectly easy to understand some of the rather complicated operations of which it treats.

Sylvicultural notes on British forest-trees, which occupies the fourth and concluding chapter, is devoted to an account of the native trees of Great Britain, with a description of the material they produce, their distribution, with notes on the climates and soils in which they flourish, together with an account of the best systems for cultivating them profitably; and, in convenient form, much useful information upon the diseases and other dangers which threaten them. The only foreign tree included in the list is the Douglas Fir of western North America, a tree of which numerous experimental plantations have been established in Great Britain and Germany, some of them upward of thirty years old.

The last *Bulletin of the Cornell Experiment Station* is devoted to the winter forcing of Tomatoes, which has become a prosperous business in the vicinity of our large cities. The most essential points in cultural practice may be summarized as follows: A Tomato-house should be very light and warm, and the roof should be at least five feet above the beds or benches. An abundance of sunlight is essential, and the temperature should be about sixty to sixty-five degrees at night and seventy to eighty degrees during the day, or higher in full sunshine. House-Tomatoes demand a rich soil and a liberal supply of fertilizers, and they will bear when four to five months old. They like brisk bottom heat and may be grown in large boxes or upon benches; eighteen-inch square boxes, placed a foot apart, and containing four plants to the box, afford one of the neatest and best means of growing Tomatoes. Winter Tomatoes must be trained. From one to three stems, depending upon the distance apart of the plants, are allowed to grow from each. These are trained upon perpendicular or ascending cords, and they must be pruned as fast as new shoots appear. The heaviest clusters should be supported. Water may be used more freely early in the growth of the plant than later. Wet the soil thoroughly at each watering rather than water often. When the fruit begins to set, keep the atmosphere dry, especially during the middle of the day.

House-Tomatoes in this latitude yield about two pounds to the square foot. The amount of the first crop does not appear to influence the amount of yield in the second crop from the same plant. Lorillard, Ignotum, Volunteer, Ithaca, Golden Queen and Beauty have been found good winter varieties. Insect pests are kept in check by fumigating with tobacco, and the spotted mite by Hughes' fir-tree oil. Fungi are controlled by ammoniacal carbonate of copper and Bordeaux mixture.

The most interesting passage in the bulletin is that which relates to the necessity of aiding nature in the work of pollination. Some account of experiments on this point was given in Garden and Forest while they were being carried on, but the subject is of sufficient importance to be referred to again. When the flowers appear, the atmosphere is kept dry during the brighter part of the day, when the pollen is discharged most profusely, but in the short, dull days of midwinter the flowers must be helped, or the fruit will not set. The common practice of tapping the plants in the middle of the day with a padded stick may be better than nothing at all, although some tests of the value of this operation showed indifferent results. The most expeditious and satisfactory method which has been used is to knock the pollen from the flowers, catch it in a spoon or other receptacle, and then dip the stigmas of the same or other flowers into it. There is a proper time in the life of a flower when the pollen falls out readily if the atmosphere is dry enough. This is when the flower is fully expanded and somewhat past its prime. If the flower is then tapped lightly with a lead-pencil the yellow powder falls out freely.

But there is additional reason for hand pollination. In-door Tomatoes are smaller than those grown out-of-doors, and midwinter fruits are smaller usually than those produced in late spring. There is also a tendency in house-grown Tomatoes to be one-sided, and Professor Bailey concluded that, although the lack of sunlight had something to do with inferior size, this lack of symmetry, and perhaps the smallness, too, were due to irregular and insufficient pollination. As an experiment two fruits upon one cluster were pollinated from the same source. In one case very little pollen was used, and it was applied to one side of the stigma only, while the other flowers received abundant pollen over the whole stigmatic surface. A picture of the fruits which resulted shows that the freely pollinated fruit was large and symmetrical, while the other was small and one-sided. In the large fruit, too, all the cells developed and bore seeds, while the smaller one had seeds on one side only. This experiment was repeated several times with substantially the same result. From these tests it appears that one-sidedness is due to the greater development of seeds upon the large side; that this increased development of seeds is due to the fact that the greater part of the pollen has been applied on that side; that abundant pollen placed over the entire surface increases the number of seeds and the size of the fruit; and that perhaps the pollen, either directly or indirectly, stimulates the growth of the fruit beyond the mere influence of the number of seeds.

Another interesting section relates to the second crop. The yield from the trained shoots of Tomatoes under glass does not exhaust the vitality of the plant, and, therefore, when the crop is well advanced, one or two new shoots may be trained from near the base to produce a second crop. If the plant is carrying fruit while these shoots are trained, liquid manure should be given once or twice a week, and a fresh mulch of manure may be added. In the dark days of midwinter there is not light enough to make strong shoots, where the planting is close, and it is better, therefore, to delay starting them until the fruit of the first crop is nearly all grown. But late in February or in March the new shoots may be allowed to grow three or four feet long before the old ones are cut away. The stocky shoots, from six inches to a foot long, give fruits as early as weak and slender ones, three or four feet long, and they make better plants. The second crop can be made to follow the first with an interval of from only four to six weeks, although this may be difficult when the planting is close. Another method of obtaining the second crop is to bury the old plants, after the fruit is off, until only a foot or so of the tips projects. The soil which was removed to make a hole into which the plant is coiled down is then filled in and the tip grows the same as a young plant. By this method the yield has not proved quite so heavy as from single shoots, although it is abundant and quite as early. The operation is laborious, and some of the stiffer plants will crack in handling. A third way of obtaining a second crop is by seedling plants which are started from seeds two or three months beforehand, and transplanted two or three times into pots. At the final removing they are taken from four or five inch pots when they are eighteen inches or two feet high and ready to be tied up. Seedlings will bear about the same time as sprouts of equal length to begin with, and the preference, therefore, will

be for sprouts, as the previous labor of sowing and handling is avoided, and, besides this, the seedlings take up valuable room while growing.

Notes.

The double Potentillas, which are now profusely blooming in all shades of orange and red, are showy plants. The flowers last a long time after they are cut as well as on the plants.

Four factories have filed applications in California for bounties on sugar production from beets. One of these, known as the China beet factory, has 4,000 acres planted in beets, and it is expected that the sugar yield will be 5,000,000 pounds.

Mr. Edwin Lonsdale writes to the *American Florist* of a new Rose, a sport from American Beauty, which differs in color from its parent, being a much lighter and more lively pink. The flower becomes lighter with age, but does not show a tendency to the purple shade so often assumed by an off-colored American Beauty. The sport originated with Mr. John Burton, of Philadelphia, and he has just planted a house with the stock for winter-flowering.

One of the most beautiful of climbers is the so-called Prairie Rose (*Rosa setigera*), which is now covered with flowers after the general Rose display is over. This plant is much more beautiful than the double varieties. It is a free grower, and will cover easily a hundred square feet of trellis with its bold, healthy foliage, which is as clean and free from fungi and insects as that of *Rosa rugosa*. The large rose-colored flowers, with conspicuous clusters of yellow stamens, come in corymbs and keep opening one after another for several days.

Monsieur Pasteur long ago expressed the opinion that the bouquet and special qualities of certain wines are due to their particular ferment. This view is supported by Monsieur Jacquemin, who reports some experiments in which he endeavored to impart flavor to barley wine by making it from wort leavened with special ferments of wines of delicate flavor, and found that the sugar-water, in which the ferment was kept, obtained the exact flavor of the various wines used, such as Champagne or Burgundy. He also imparted the flavor of apples and pears by using their ferment in barley wort. The cultivation of particular microbes to furnish any given bouquet to fermented liquors is now in order. It may be, in the future of wine-making, that the quality of the ferment will be considered of more consequence than the quality of the grape.

Agricultural Science contains an account of some European experiments which seem to show that the copper salts so generally used against fungal diseases of the Grape and other plants may be hurtful to vegetation. Certain cereal Grains and Grasses planted in pots were watered with pure water and with water containing copper salts in different proportions, and the dry matter in the harvested plants decreased regularly as the copper salts increased. It was found that the lime and potash in the soil, where copper sulphate was used, formed soluble sulphates, which were washed into the subsoil, while the copper oxide remained at the surface to poison the roots of the plants. The addition of lime to the Bordeaux mixture, of course, lessens the danger of such deterioration. If it is true, as now stated, that weaker solutions of copper salts than those now used are effective as fungicides, the strength should be reduced for other reasons than that of economy.

At the Convention of Nurserymen recently held at Minneapolis, Mr. J. V. Cotta said that the breeding of a race of Apple-trees from seeds gathered from the hardiest known varieties to the manner born was possible, but it would require a generation before these hardy trees, which yielded late-keeping fruit of good quality, could be produced. He had practiced another method. Under this system varieties too tender for the northwest, when grown by root-grafting or budding, could be produced so that they would endure climatic adversities two or three hundred miles farther north than their profitable range under the old method. This way is to top-graft them, standard-high, on perfectly hardy, free-growing, congenial stocks which have been previously grown by root-grafting; or, in other words, the plan is to double-work the trees. He has practiced this for nine years with entire satisfaction. Of course, double-working means double expense, and often more, but with his present experience he would no more think of planting an orchard of root-grafted or of budded trees of a less hardy strain than the Duchess, even in northern Illinois, than he would of attempting to grow Figs or Oranges there as a commercial venture. In the spring of 1883 he found his root-grafted trees, with a few exceptions, such as the Duchess and some Crab-apples, almost ruined, while top-grafted and double-worked trees of the same sort came out sound to the tip.

A private letter from our correspondent, Monsieur Charles Naudin, written at Antibes, informs us that the beautiful *Sophora secundiflora*, a small tree of western Texas and northern Mexico, introduced into Europe a few years ago through the Arnold Arboretum, has flowered this year for the first time (probably in Europe) in the gardens of the Villa Thuret, and is now ripening its fruit. Among other recent introductions from North America now flourishing in these gardens are *Isomeris arborea*, introduced in 1881, and now flowering and producing fruit abundantly every year; *Pinus cembroides*, *Hicoria myristiciformis*, *Juglans Californica*, *Prosopis juliflora*, *P. pubescens*, *Bumelia lycioides*, introduced in 1880, and now flowering and fruiting every year, *Dasylirion quadrangulare*, *Lupinus arboreus*, *Leucœna pulverulenta*. This last, if it succeeds as well as it does on the banks of the lower Rio Grande, promises to be one of the best shade and ornamental trees that have been planted in southern Europe. Curiously enough, as we learn from our correspondent, *Olneya Tseota*, the beautiful leguminous tree from Arizona and Sonora, cannot be induced to grow, although the seeds germinate freely enough at Antibes; the seedlings soon become sickly and perish. The same is true of *Pinckneya pubens*, which has been tried on several different occasions at Antibes without success. Three large plants of *Yucca filifera* (see Garden and Forest, vol. i., pp. 78 and 79) were flowering at Antibes on the 20th of June, and had produced panicles more than forty inches long. This, Monsieur Naudin writes, is certainly one of the most important ornamental plants which have been introduced into Europe during the present century.

The Formosa camphor of commerce is obtained from *Laurus Camphora*, of which immense forests cover many of the lower ranges of hills in the island, extending up the lower slopes of the mountains. Many of these forests have not been invaded, and the statement that the camphor supplies in the southern part of the island are becoming exhausted applies only to those districts which are purely Chinese. The supply from other parts of the island is said to be practically inexhaustible; and, even in the districts inhabited by the Chinese, it is only in certain places that the supply is falling off in consequence of the reckless manner in which the trees have been destroyed, partly for the sake of their timber and for camphor, and partly, probably, to clear the ground for cultivation. It has been stated that the method of obtaining crude camphor in Formosa was by steeping the chopped branches in water and then by boiling them until the camphor begins to adhere to the stick used in stirring, when the liquor is strained and the camphor is allowed to harden. By this method it is not necessary to destroy the tree. It may have prevailed formerly, although it certainly does not at present, the yield of camphor from the branches being too small to repay the cost of extraction. A recent British consular report gives some details of the method now in general use. A tree is selected by an expert, who scrapes into the trunk in different places with an instrument resembling a rake, for the purpose of ascertaining if it contains sufficient camphor to repay the cost of extraction. Trees less than fifty years old do not produce camphor in paying quantities, and the yield varies considerably in individual trees. Sometimes one side only of a tree contains sufficient camphor to make extraction profitable, and, in this case, that side alone is attacked. The trunk is scraped as high as the workman can conveniently reach, and the scrapings are pounded and boiled with water in an iron vessel, over which an earthenware jar, made especially for the purpose, is inverted. The camphor condenses on the inner surface of the jar, and is removed from time to time. The root of the tree and the trunk, for some eight feet up, contain the greatest quantity of camphor. If the scrapings obtained from the trunk yield well, the chipping is continued until the tree falls. The roots are then grubbed up and the camphor from them extracted. If the scrapings are not sufficiently productive, the tree is abandoned and work is commenced on another. No effort is made to extract the camphor from the fallen trunk or from the branches. In some cases the trunk, however, is sawed into lumber, but this depends on the locality where the tree is growing. In many districts, owing to the want of roads, the timber would not pay the cost of its transport. It is impossible to imagine a more wasteful method, and it is fortunate that these camphor forests extend over a large part of the islands. Ten of the iron pots in their accompanying jars make up what is called a "set," and are worked by four men. One set will produce about sixty-five pounds in ten days, but this yield is reached only under the most favorable conditions.

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The Planting of Home Grounds.

"THE union—a happy marriage it should be—between the house beautiful and the ground near it," says a writer in a recent number of *The Garden*, "is worthy of more thought than it has had in the past, and the best ways of effecting that union artistically should interest men more and more as our cities grow larger and our lovely English landscape shrinks back from them." This writer, we may divine from the initials signed to the article, is Mr. William Robinson, whose essays and books have already had an excellent influence upon contemporary gardening art in England. We are not surprised, therefore, to find that, in speaking of the ground near a country house, he should advocate treating it in a manner which will harmoniously unite it with the landscape beyond, thus making a beautiful whole of the near and distant surroundings of the house. This ground he calls "the garden," although this term is more generally understood as meaning something in the nature of an enclosure, where plants are grown without any thought for harmony of general effect, or for the proper connection between all the spaces which the eye can compass in a single view. Taking "garden" to mean all the grounds close to the house—the "home-grounds," as is sometimes said—he explains that there are situations, as on the hillsides of Italy, where the nature of the spot prescribes a formal, semi-artificial garden. But, he continues, "the lawn is the heart of the true English garden, and as essential as the terrace is to the gardens on the steep hills"; and, in general, these words are true for America as well. There is less need in America than in England to protest against formal gardens where such lawns, with appropriate framings and backgrounds of foliage, should exist. In this country we are not very fond of designing "geometrical gardens," even in those occasional cases where some natural or architectural peculiarity would sanction their existence; and it would be difficult to discover American homes where "on level ground the terrace walls cut off the view of the landscape from the house, and, on the other hand, the house from the landscape." Nevertheless, there are other errors in garden design into which we are as apt as the English to fall, and we should be doubly anxious to avoid them, as our architects seem to be succeeding better than the English in creating that "house beautiful" which must be the centre of the complex ultimate picture. That is, if Mr. Robinson's taste in such matters can be trusted, "most of the houses built in our time," in England, "are so bad that even the best garden could not save them from contempt"; but, though we often build bad houses too, and though our average efforts are less ambitious than those of Englishmen, many of our country homes are so good architecturally that one thinks, with a pang, how much more beautiful they would be were their "home-grounds" properly arranged and planted.

How to plan and plant such gardens as these is the problem to be considered. We will suppose that the house has been advantageously placed, that it looks out upon a beautiful landscape, and that the intervening space is of such an extent and character that it can be made an harmonious link between the house and the landscape, giving the house a fitting environment when seen from a distance, and the landscape a fitting foreground when seen from the house. The two questions then are, How to plant, and What to plant.

As regards the manner of planting in such cases much has already been said in these columns, and it may suffice briefly to repeat that there should, if possible, be a wide extent of lawn or lawns to give repose and unity to the picture, with surrounding plantations, varied in mass and sky-line, to enframe the lawns and connect them with the landscape; that open outlooks should be left to reveal the most beautiful portions of the distance, while disagreeable objects are masked from view; and that roads and walks should be as few and as inconspicuous as convenience will permit. If a good landscape-gardener is employed, these arrangements will be planned and their preliminary portions will be executed without much trouble to the owner. But in settling the question what to plant in completing them the landscape-gardener, in America as in England, often seems in need of guidance as well as the owner, and when his views are just, the owner too often interferes with their development or adds inharmonious details of his own as the years go by.

Mr. Robinson is partially right when he says that most people who care for gardens (still taking the word in the wider sense he gives it) suppose that they are made for plants, and that "if a garden has any use it is to treasure for us beautiful flowers, trees and shrubs." Yet this idea of a garden's function is too narrow, and devotion to it often deforms even small gardens which have no purpose except to surround the house agreeably, still more often deforms larger ones which serve as a foreground for a beautiful prospect. A garden is, beyond question, a place where beautiful plants are to be fostered; but it is also an entity which should be beautiful as a whole and in harmony with its surroundings. And, however well planned, its beauty may be spoiled, and a look of painful artificiality may be given it if its contents are injudiciously selected. Therefore we must dissent from Mr. Robinson when he says, "The true use and first reason of a garden is to keep and grow for us plants *not* in our woods, and mostly from other countries than our own." The true use of a garden is to grow for us beautiful plants of such a kind that their association will form a beautiful whole, beautifully in keeping with the house and the surrounding landscape. In fitting it for this use we are at liberty to get our trees, shrubs and flowers where we will, provided we introduce none which, by a discordant note, will mar the general effect, which must be determined by the character of the local landscape. To be harmonious, and therefore beautiful, a garden, over which we see the Berkshire hills or the valley of the Hudson, must be evidently an American gar-

den, just as one in the valley of the Thames must be English, and on the southern shore of France must have the mixed, semi-tropical character peculiar to the Mediterranean coast. To secure this proper local character, local plants are almost essential for the groundwork; and then, to give variety, interest and a true garden-like air and charm, exotics should be mingled with them. But these exotics should never be chosen for their rarity or novelty alone, or even for their intrinsic beauty, and still less, as is too commonly the case, for their mere conspicuousness. First of all they should harmonize with the other plants about them, and the novice may well hesitate before dipping deeply into those stores of foreign plants which are now so vast and varied and accessible. His choice will not be narrow, if, in addition to native plants, he selects such as have come from lands with climate akin to our own. In using these last he will be following Nature's own example. Here in America she does not confine herself to growing plants which were originally American. She takes up vegetable immigrants as hospitably as our civilization takes in human immigrants, and assimilates them as quickly and naturally. Who would suspect the White Willow in New England, or the Pawlonia in the woods of Maryland to be an exotic? And who sees anything inharmonious or strange in the aspect of the Ailanthus-trees which, mingling with the native Elms, shade the rustic streets of Nantucket? Nature chooses which exotics she will grow for what we may call scientific reasons, but the artistic effect of her results is invariably good. And man should learn from her how to make a similar choice, taking a wider liberty, of course, when he is planting a garden than when he is planting a forest, but never forgetting that, in a garden such as we are now describing, he should grow together only such plants as will look well together. There are exotic flowers which look as natural, as appropriate, in a garden as the Marguerite of Europe looks in our meadows. But there are others which seem entirely out of place as parts of an American garden which has any design—any character at all.

This is not meant to disparage the cultivation of rare or novel or conspicuous plants, whether native or exotic. Many refined persons take the keenest delight in individual flowers and collections of plants for their own sake, and without any reference to their relation with the surrounding scenery. But in grounds like those now under consideration, there will be ample space to grow them in locations specially set apart for them where they will not injure the main picture formed by the general environment of the house and the encircling landscape. As regards the grounds, the "garden" in its wider sense, it will assuredly be most beautiful, interesting and enjoyable when both native and foreign plants have been used in tasteful combination. But if confined to one of these classes we should probably lose as much by adopting Mr. Robinson's idea, that the first reason for this sort of a garden is "to grow for us plants *not* in our woods and mostly from countries other than our own," as we should if we adhered exclusively to the plants of our own country. Using these alone the planter will miss a thousand chances for securing beauty and variety, but he will not run the risk of the greater misfortune of producing a garden full of beautiful plants, but not a beautiful garden, after all, nor an appropriate environment for his house, nor a suitable foreground for the landscape beyond.

From a note on another page of this issue it will be seen that the Trustees of Public Reservations, the body incorporated under an act of the last Legislature of Massachusetts, for preserving beautiful and historical tracts of land within that commonwealth, has been organized, and is ready for work. Our readers need not be told that we heartily commend the objects of this association, for it has been one of the steady purposes of Garden and Forest since its foundation to aid in forming public taste and guiding public sentiment in this direction. The plan adopted seems business-like and feasible, and now that the machinery is in competent hands and fairly under way, it is a proper time to say that the success of the enterprise in its early stages is due very largely to the energy and intelligence of Mr. Charles Eliot, the secretary, who really assumed the burden of carrying the measure through. It ought to be said also that the successful inauguration of such a movement in a community is an indication of a high order of enlightenment. The people of Massachusetts have reason to be proud of it, and they should encourage and promote it in every reasonable way. It is to be hoped that public-spirited men and women in other states will be prompt to organize similar corporations until it becomes a settled policy throughout the country to preserve the natural beauty which we have inherited, and to protect from defacement and ruin, and for the inspiration and enjoyment of our children's children, all places about which patriotic and historic memories cluster.

Mr. John Robinson, in his interesting and valuable series of papers on the "Trees of Salem," now being published in *The Salem Gazette*, suggests, in speaking of our two poisonous species of Rhus, the only poisonous plants of our northern flora, a few simple rules which can be easily remembered, and which will aid persons in recognizing these plants, and at the same time prevent a needless fear of the many beautiful flowers and berries of the woods and meadows. These are his rules:

Never put any portion of any plant in the mouth unless it is certainly known to be wholesome.

Have no hesitation in handling any plant that has beautiful or attractive flowers, berries or fruit of any kind, for the two poisonous native plants have inconspicuous greenish flowers, mostly under the leaves, and later small bluish white berries close to the branches or hanging from them.

Beware of gorgeous red and yellow autumnal leaves on shrubs and climbing plants which are not known to be harmless. Our two poisonous native plants display the most brilliant autumnal colors of any species in our woods and by-ways.

The poisonous Sumach resembles a group of young Ash-trees.

The poisonous Ivy resembles the harmless Woodbine. Its leaves, however, have but three leaflets, while those of the Woodbine have five.

Dijon.—I.

THE city of Dijon lies in a charming valley at the foot of the hills of the Côte-d'Or in one of the most fertile and beautiful regions of France. It is said to have been founded in the early days of the Roman empire. Upon its history, however, I have no purpose to dwell, nor yet upon its buildings, which, despite the generally modern look of the place, still make it interesting to the artist and the antiquary. Its parks are less famous, but well deserve the notice even of those travelers who come in great numbers during the summer, but, intent on reaching Switzerland as quickly as possible, usually do no more than sleep a night in the huge hostelry, called the *Cloche d'Or*, which, in its unlikeness to the inns of most French provincial towns, seems a prophecy of the tourist-ridden land toward which they yearn.

It is only a short walk from the hotel, and only a step from the railway station, to the gardens called *L'Arquebuse*, which formerly served the local Society of Arquebusiers as their place of exercise. We are not told when they were first established, but it is known that, in the year 1591, Henri IV. here joined in the sports of the Dijonais musket-men. Their disposition seems to have been the result of chance rather than design, and although they contain some symmetrical features, they give, as a whole, a naturalistic impression and form a pleasant, verdurous, shady and not unpicturesque resort.

Close to *L'Arquebuse*, and separated from it only by a little stream, lies the Botanical Garden, founded by Legouz de Gerland in 1772. It covers a wide area, and, in addition to the regular beds where the smaller plants are grown—among them being 300 varieties of the Vine—it contains a park-like space through which flows the little stream, forming in one spot a miniature lake, the general design suggesting the fact

that at the end of the last century "English gardens" were becoming popular in France. Some fine cut-leaved Alders grew by the bank of the stream, and on the edge of the pond large Taxodiums were throwing up their "knees," as they do in the Florida swamps. Many other beautiful specimen trees attracted the eye; and though Weeping Willows can hardly be called beautiful, historical sentiment was stirred at the sight of a large example which had grown from a twig brought many years ago by Montholon from St. Helena.

Their plants, not their design, give these two gardens their interest; but the one which forms the central feature of the newer part of the town is as charming an example of the artistic treatment of a small urban pleasure-ground as I remember to have seen. The intersecting streets here leave a long and rather narrow isoceles triangle. The point of this triangle is occupied by the Place Darcy, but the greater part is filled by the park. At its broader end the ground lies high above the surrounding streets. Here a wide space has been laid out with a music pavilion in the centre and with a graveled surface that may be covered by chairs upon occasion, but closely shaded by many regular rows of fine Plane-trees, concentrically arranged near the pavilion and in rectangular lines at a greater distance. From this space the ground descends steeply toward the street on three sides, turfed, planted with graceful groups of low trees and shrubs, and everywhere encircled by a gilded railing of good design. On the fourth side, however, which faces the Place Darcy in the point of the triangle, the rapid descent of the ground is utilized to form a fine series of marble terraces with cascades rushing out beneath them and falling into rectangular basins set with aquatic plants, flights of steps flanking the cascade on either side and being flanked themselves by the lateral slopes of turf, which in this part end at gravel walks running near the outer railing, well shaded and furnished with comfortable seats. The level of the street is reached before we get to the limits of the park at its narrower end, and here we find the usual arrangements of paths, grass-plats and seats very charmingly managed; and hence, as we look out on the Place Darcy, we find that even its open space has been brought into the general scheme, an oval of grass and shrubbery lying at a little distance from the borders of the park, then at a greater distance a tiny triangular plantation, fitted to the shape of the contracting triangle, and finally, closing the long converging perspective, a triumphal arch, which stands across the entrance of the Rue de la Liberté.

The view of this lower portion of the park and of the Place Darcy, seen over the cascades from the terraces above, is extremely impressive, considering the small scale of the whole; and a word should also be given to the arrangement of the shrubberies on the lateral slopes of the park. Whether seen from above or seen from the street outside, one cannot but admire the skill with which they have been disposed; now running outward till they reach the railing with their luxuriant masses of drooping foliage, and now curving inward to leave a wide stretch of grass next the street, or, here and there, room for a little path, a graveled spot and a big marble bench whence the lively panorama of the street may be viewed at once. The harmonizing of the formal upper portions of the park (which, by the way, is properly called the *Promenade du Château d'Eau*) seemed to me very skillful, and, taken as a whole, this pleasure-ground would, I think, convince any observer that formal and naturalistic elements may be happily joined, and that, in a small urban park, the presence of formal features is extremely desirable. No wholly naturalistic design could have given this park so great a serviceableness or so much dignity, or could have harmonized it so well with the surrounding rows of buildings; of course, its designers were lucky in having a piece of ground so varied in surface to work upon, but had they not been artists they would not have profited by their opportunity. It was easy, but not pleasant, to fancy what the place might have been in the hands of an unskillful designer.

New York. *M. G. Van Rensselaer.*

How We Renewed an Old Place.

XIII.—EVERGREENS IN SPRING.

I KNOW few things more depressing than the sight of conifers in May, when every deciduous tree is putting its best foot foremost and giving promise of a fine crop of leaves. The Pines and Spruces and Firs which have gladdened our eyes all winter, with their fine green masses relieved against the snow, or standing up bravely from the brown grass, in rich contrast to the barrenness around, now begin to show the sere and yellow leaf. The March sun and winds have burned and browned their tips, the winter storms have buffeted their branches and torn great gaps in their outline. Their new shoots are all hidden under a little tight white or yellow, or brown nightcap that looks dried and wizened, as if no promise of life lurked underneath.

When the snow melts sufficiently for one to walk abroad among his plantations, he views them with a feeling akin to despair, so unlikely do they seem to recover themselves. Some branches are entirely dead, the tops of others are winter-killed, a few have turned copper-color from root to crown, and beside the bright green of bursting buds and springing grass, the best of them look worn and dingy by contrast.

Not until the middle of May do they pluck up their spirits, pull off their bonnets, and show that their apparent deadness resulted from the fact that they take their season differently from their gayer neighbors, and wear their winter furs, however rusty and inappropriate, far into spring, while all the others have come out in their new clothes of brightest hue. Some years June will be here before they condescend to put out the green tassels which are their first adornment, but through the month of roses they do their prettiest, and hang out their banners with the best.

Some of the authorities recommend the month of June as the most desirable for transplanting evergreens, but my experience would lead me to the conclusion that with them, as well as with hard-wood trees, the period before the bursting of the buds is more satisfactory than the time when they have already begun to swell. Seasons vary so decidedly that a few warm days may hasten the new shoots, and they may be three inches long before you think of going for trees, so that they droop discouragingly after transplanting, and sometimes never brace up again. This is particularly the case with Pines, which have a way of drooping their little brown heads despairingly, and refusing to stiffen, in which case, if they cannot be freely watered, they are sure to die.

This year the warm days in April so quickened all vegetable life, that, when we set forth in the middle of May in search of new trees for the hill, we found to our surprise that the green tassels on some of the trees were as long as one's finger, which gave us a pang lest we were already too late for the best satisfaction.

However, as there had been already some six weeks of unprecedented dry weather, and there were signs of rain in the atmosphere, it seemed that if there was any chance at all, now was our time. We accordingly arranged for a morning among the Pines, and, accompanied by a big farm-wagon to bring them home in, we wended our way along the winding country roads, until we came to where the young trees abounded, and we could select our specimens.

There is little doubt that the stocky, bushy trees of close, heavy foliage, not more than two or three feet high, are the most likely to live and do well, but there are days when one's ambition outruns one's discretion, and, revolting at the slowness of the growth of the little ones, he desires to realize his forest immediately, if only for one summer, and so, like a child who plants his sand-garden with blooming flowers, ventures on a load of trees five or six feet high, in hopes that, after making a brave show for a few months, they will be aided by some happy freak of nature to take root in earnest.

But planting Pines on a dry hillside is like investing in a lottery—the success of the enterprise depends wholly on the sort of weather that immediately follows, and who can reckon with that? Talk of the vicissitudes in the life of a broker—what are his uncertain and incalculable quantities compared to those with which the farmer and gardener have to deal? A broker can abstain from buying bonds and stocks if he will, but the farmer has to plant when the time comes, and take his chances, and for surprises the weather can give points to Wall Street any day. With the largest experience and judgment you can no more reckon securely on the coming down of rain than of Bell Telephone, or Calumet and Hecla.

No sooner are one's trees planted than he becomes a bear upon the weather market, but this summer old Probabilities has made a corner with the bulls, and kept rain up persistently, so that the wisest calculations have gone agley; and if Paul plants, and Apollos declines to water, what then?

To return to our expedition. There was an easterly tang in the air, a smell of rain that promised well for the morrow, though in the shelter of the trees all was warmth and sunshine, and bursting buds. Upon the rocks the Lady's-slipper was waving its rosy blossoms, tempting us to add a few roots of it to our shady garden, where it has thriven well. The Beeches and Birches were full of crumpled leaflets, Anemones were blooming by the wayside, the Oak-tops were reddened with the flush of early leaf-buds, the forest was astir. Along the fences

ran the busy chipmunks, saucily chattering with their bushy tails trailing behind them. The wood robins were singing in the thickets, and the thrushes challenging us from wayside bushes. In northern Maine one hears always in summer the tender song of the Peabody bird in such places, but here it occurs but seldom, and I missed it from the woodland sounds, of which the air was full. The Witch-hazel stared at us with its wicked-looking eyes, and the Hemlocks hid themselves behind the Alders.

When at last we came to the clearing, we found Pines in plenty, but, unfortunately, the soil was rocky, and the trees were hard to dislodge, and did not come up with as good a ball of earth as in the sandy hill where we had found them before; but we packed them well away in the cart, with moss about their roots, and a rubber blanket to keep off the sun, and pretty soon the wagon was nodding with trees four or five feet high, closely jammed together, and Birnam Wood was on the march for Dunsinane.

The hill had been dug the day before, and some two score holes prepared for the new-comers, so that by noon-time those of the first load were all firmly wedged into their beds, to be staked and tied later, to prevent their rocking with the wind, which gives them at present quite the air of a paddock of frisky young colts, carefully hitched to prevent their getting away.

That night there was a brisk and most encouraging shower, and the next day, after the rest of the holes had been filled with a second load of Pines, there came down quite a respectable rain, so that we greatly plumed ourselves upon our foresight in having got in our trees in the nick of time, just as the drought "broke."

But, alas, for the prescience of man, and for our corner in Pines! We mulched them all well with sea-weed, to keep in what moisture we might, and waited confidently for more rain; but no rain came! Two weeks more of dry weather ensued, many of the green tassels hung sadly down, a cold, dry wind blew, twisting and turning them in every direction, and mercilessly whipped the branches about, giving the poor things a cruel foretaste of what they are likely to encounter as time goes on. If the new trees look about upon their well-rooted neighbors they must be struck with the havoc made upon them by the north-west wind. It is always the north-west side of a tree that is brownest and thinnest, and which shows the most broken branches, and the greatest number of withered, copper-colored spines.

Not until May 29th did the rain come down in earnest, too late for any but the most healthy of the Pines to reap the benefit of its invigorating freshness, and they still have a long hot summer before them.

To show the importance of moisture to a Pine, I will add that among the trees brought, there were about a dozen that had no ball of earth attached to them, and reached here with perfectly bare roots. Knowing it was useless to set them on the hill in this condition, they were all planted in a very wet place at the foot of it, which is kept as a nursery for decrepit and rootless trees. If from anywhere we receive a tree poorly provided with roots, or of drooping and unhappy aspect, or if we bring one home that looks unpromising, into that moist spot it goes, and never a tree has perished there yet, no matter how forlorn a specimen it was when it went into the ground. This nursery is called the Tree Hospital, and we find a year in it is a cure for most of the ailments that roots are heir to.

In this last experiment, the ten trees planted there, though quite the worst of the lot, never have shown a sign of wilting through all the dry weather. Their tassels stand up straight and stiff, of a clean bright green, and, though so unpromising to start with, will probably in the end leave the others far behind. Even the Hemlocks, so troublesome on the lawn, thrive in this low and sheltered spot, where we have finally sent the worst of them for repairs. I have been told by one who knows, that what the Hemlock cannot abide is the March sun, which does mischief, while the blaze of summer is harmless to it.

I was shown one day at the Arnold Arboretum, near Boston, the north side of a hill, steep and rocky, but clothed with giant Hemlocks from its lofty summit to the burbling beck at its base. No nobler sight can be imagined. I entered this forest at twilight, and I found it a temple, solemn and silent. The majestic trunks rose from their rocky base at wide intervals, climbing one above the other to the crest of the lofty eminence they crowned. Their close-knit branches, far overhead, formed a dense canopy through which the failing light came dimly, as befits a temple. So wild, so sylvan a spot, within the limits of a great city, can be found in no European park, however magnificent. It is unique and singularly imposing. On the southern slope of that hill no Hemlock grows, showing that what this noble tree demands for full development is shade and coolness, and shelter from summer winds, which burn and blight. That glimpse of ancient woodland, ages old, will always linger in my memory as a link between the bustling present and the silent past. The busy city presses around it, the hum of traffic is near. You step aside from the highway, pass a gate, cross a tiny brook that tumbles as carelessly at the foot of the hill as if it were racing through the wilds of Colorado, and you enter a domain apparently as remote, venerable and silent, as when the Indian was the sole occupant of Shawmut, and found his way through the trackless forest to his hunting-grounds. A little path worn by the foot strays along beside the laughing stream; other paths may lead over the hill, but in the dimness I failed to see them, and the solitude seemed unbroken. Night was falling, the air was chill, the murmur of the leaves far above was barely audible, the impression was indescribably solemn and church-like, as if the aisles of some great cathedral were there stretching away into the shadowy distance, full of mystery.

Stately and strong the old trees stood, as if they might be as eternal as the rocks and hill, and beautiful they were in their silent majesty, uplifting their venerable heads to the gray evening sky which had domed over them for centuries.

On an opposite hill a grove of young evergreens was springing up.

"That, too, will be fine in a hundred years," said the Director, as we passed out of the great gate; and, with a thought of my baby-forest at home which, perhaps, in a century or two, may be worth while, I went away grave but rejoicing, for I had seen a noble sight.

Hingham, Mass. *M. C. Robbins.*

The Weeds of California.—II.

AFTER the general sketch already given, the more important weeds of California may be discussed in detail, under their respective orders, in the usual sequence.

Of the *Caryophyllaceæ*, the most universally diffused and troublesome member is *Silene Gallica*, which seems able to withstand the most severe aridity attained in the lowlands of California, at least in the central portions of the state. *Stellaria media* is among the most persistent of summer weeds in cultivated vineyards and orchards; while in spring, *Spergula arvensis* takes possession of the moister grounds in the Coast range as well as in the great valley. *Mollugo verticillata* is seen sporadically, but is not as troublesome as in eastern corn-fields.

Of the *Papaveraceæ*, the *Eschscholtzia Californica* maintains itself somewhat tenaciously in pastures, but hardly in regularly cultivated ground. Yet, in grain-fields, where its spring bloom has been prevented by cultivation, it will very commonly recoup itself by a copious autumn flowering, and thus it forms large areas of flaming orange on the outskirts of growing towns, where the ground has ceased to be cultivated with regularity.

Of the *Malvaceæ*, almost the only member that is really a weed is the *Malva parviflora*, although a few others are locally complained of. This, the "Malva" par excellence, regarding the extirpation of which many newspaper articles are written. It is at home in the heavy black clay or "adobe" soils of the Coast range, where it will grow to four and five feet in height, under favorable conditions; but on roads it will form decumbent, wheel-like masses, resembling those of its eastern congener, the *M. rotundifolia*. Its seeds, borne in the greatest profusion, will germinate with the most surprising readiness, even when the plant is killed quite green; the seedlings will be found coming to the surface from the depths of the soil-cracks in midsummer, and mature an abundance of seed under the most discouraging conditions, It is one of the most persistent weeds the California farmer has to fight, and its extirpation from ground once well stocked with it seems almost hopeless. Some have recommended it as a forage plant, but few cows will touch it so long as anything else is in sight.

The *Geraniaceæ* are prominently represented by the *Erodium cicutarium* and *E. moschatum*, both commonly known as alfileria or alfilerilla, and both widely diffused. The first-named, however, the one that has been carried even to the remotest districts of the state, is distinctively the species possessing value as a forage plant. The *E. moschatum* is so distinctly of musky flavor that, like Anthoxanthum among the grasses, it is eaten only in limited quantity by any animal, as a flavoring; an alfilerilla pasture once overrun with the musky species ceases to have much value; and in heavy, rich

soils the more valuable kind is often completely run out by the other. In light, sandy soils the *E. cicutarium* is more likely to hold its own. Its long, red tap-root will then descend for moisture to the depth of several feet, and its leaves will keep green when everything else that is of value as forage is dried up. The rosettes formed by its radical leaves lie close to the ground in winter, and resist even heavy frosts without injury. Both plants are regarded as marks of a rich soil; and in such soils the task of keeping them in check is indeed a serious one, for the seeds will continue to germinate in the driest and hottest times of midsummer, after the land is "laid by"; and the costly operation of hoeing alone can master it at that season. The propagation of the alfilerilla as a pasture plant is rendered difficult by the nature of the seeds, with their long, spirally coiled awns (styles); and in certain sandy soils of south California its spread is sometimes arrested by the red ant, which gathers the seeds in its burrows, leaving conspicuous piles of the awns outside, around its hills.

Oxalis corniculata is locally a very persistent weed, resisting the summer's drought to an extraordinary degree; but it is not generally distributed, though more common in southern than in northern California.

Fig. 56.—Populus Monticola.—See page 330.

The western Poison Oak, or Sumac (*Rhus diversiloba*), is a very persistent invader of pastures on which it formed part of the original growth, and keeps sprouting up from fragments of root-stocks remaining alive in the soil for years. In company with the Brake Fern (*Pteris aquilina*) it is usually the last of the native vegetation to be subdued by cultivation, both in the Coast range and in the foot-hills of the Sierra Nevada.

University of California. *E. W. Hilgard.*

New or Little-known Plants.

Drymophlæus olivæformis.

THIS is one of about a dozen species of Arecoid Palms peculiar to tropical Australia, New Guinea and several small islands adjacent. The genus is closely related to the true Ptychospirmas and Pinangas, and it resembles them in having unarmed, thin, elegant stems, which often flower in cultivation when only a few feet in height, and continue to flower annually. Drymophlæus is scarcely known in cultivation outside botanical collections, although most of the species, the one here figured in particular, are ornamental and of convenient size for pot-culture in ordinary stoves.

D. olivæformis, Mart., is a native of the Moluccas, where it forms a slender stem from fifteen to twenty feet in height, with a spreading head of pinnate leaves. The Kew plant, from which the accompanying photograph (see page 331) was made, is about fourteen years old, and at present its stem is three feet high, its leaves three feet long, and the wedge-shaped pinnæ are about five inches wide at the apex, the upper margin being jagged like a fish's tail. The texture of the leaves is soft and fleshy for a Palm. An inflorescence is produced annually, and the plant is about six months in maturing its fruit. The flowers are small, white monoicous, and the fruits are egg-shaped, an inch long, and colored rich scarlet. At the time when the photograph was made the fruits were at their best, and were as attractive as the brightest of flowers. Like all the Palms of this section of the order, Drymophlæus requires a tropical moist house and plenty of water at all times.

London. *W. Watson.*

Populus Monticola.

WE are able to publish a figure (p. 329) this week, made from material with which the discoverer has supplied us, of the interesting and very distinct Poplar found in Lower California in January of last year by Mr. T. S. Brandegee.

*Populus Monticola** is a tree which grows sometimes to the height of eighty or ninety feet, with a stout trunk three feet through, covered with rough ash-colored bark and with ascending branches and slender terete branchlets, which are covered when they first appear with thick white tomentum, and during the first year at least with pale silky pubescence. The bark of the trees, until they are about thirty feet high, is described as smooth and light-colored, resembling that of the Aspen, and it only becomes rough on large trunks. The bud-scales, which appear to persist until the leaves are nearly half-grown, are ovate, rounded at the apex, ciliate on the margins and coated with silky white pubescence. The leaves are broadly ovate, coarsely and sinuately dentate, often acute or sometimes rounded at the apex, and wedge-shaped or nearly truncate at the base. They are conspicuously reticulate-veined, three inches long by as much broad, or often somewhat smaller, and are three-nerved from the base, the middle nerve being furnished with two or three pairs of principal veins. The leaves are silky pubescent on the two surfaces, especially on the broad nerves, and are borne on slender terete petioles two inches long and covered with thick white tomentum. The stipules are linear, chartaceous and early deciduous. The fruiting ament is an inch long and a third of an inch broad. The capsules are ovate, thickly coated with white silky tomentum, and two to three-valved. There are usually two styles united at the base; the disk is small and nearly flat; the scales are rounded, slightly sinuate-dentate, ciliate on the margin, but otherwise almost glabrous. The male flowers have not been collected.

"*Populus Monticola* inhabits," Mr. Brandegee informs us, "the high mountains of the interior of the cape region of Lower California, growing along the streams and following them into the cañons well down toward the warm lowlands. At high elevations (5,000 feet), and growing in cool, rocky gulches, it is not more than twenty feet high. At lower altitudes it becomes a large tree, nearly 100 feet high, and is a favorite support for the wild Grape-vines. The wood is of a light reddish color, and is used for making furniture.

"This Cottonwood is known by the name of Guerigo to the inhabitants, who distinguish it from the common one of the fields and gardens, called by them Alamo. The leaves and flowers appear in February, and in October all are fallen, a season of growth usual in California, but very different from the ordinary habit of the plants of the cape region of Lower California, where most of the vegetation comes forward with the summer and fall rains at the time when the Cottonwoods are losing their leaves, and appear to be preparing for the winter, which, however, never comes. The contrast between a flora dying and a flora coming into life, at the same time and in the same place, is strange and interesting. Associated with the Cottonwood in locality, and in its habit of coming forward with the new year, are the Arbutus, Rubus, Ribes, Prunus, Heteromeles, Vitis, etc., although plants belonging to northern genera do not always have flowers that bloom in the spring." *C. S. S.*

* *Populus Monticola*, Brandegee, *Zoe*, i., 274.

Cultural Department.

Stray Notes from the Arnold Arboretum.—IV.

AMONG exotic Cornels, as at present represented in the Arboretum, there are only two which possess ornamental qualities of a different character from those found in our native species, and which will repay cultivation in this country. There are some east Asian species, which are not introduced, and a few others only imperfectly known, so that there is a chance that the number of good garden Cornels may still be enlarged.

The two foreign species which can well be added to our shrubberies are the White-fruited Dogwood, *Cornus alba*, and the so-called Male Dogwood or Cornelian Cherry, *C. Mas*. The first is a spreading shrub which, in good soil, grows to the height of six or ten feet and produces slender, recurved branches covered with bright red bark. In habit and in the general appearance of the foliage and flowers, and in the color of the fruit, it bears a strong resemblance to our native red-stemmed Dogwood (*C. sericea*), and the only advantage it possesses over that species is in the brighter color of its branches in winter. In this particular it is far superior to the American plant and should replace it where the attempt is made to produce a bright effect in the shrubbery during the winter months. There is a variety of this plant occasionally met with in nurseries under the name of *C. Sibirica*, which has deeper-colored and brighter branches than any other plant which is hardy in this climate; and this, rather than the more common form, should be planted. Of the origin of this variety not very much is known; it may have been brought from Siberia or it may have appeared in some European nursery. The earliest mention of it is to be found in the catalogue for the year 1836 of the Loddiges, fifty years ago famous London nurserymen who maintained a large and very rich arboretum in connection with their business.

C. alba is widely distributed and very common in Siberia and through northern Asia, and in this country is perfectly hardy. It is, like all the Cornels of this class, easily raised from seed or from cuttings made in the summer; it grows as rapidly as any of the native species, and can be mingled with them without danger of offending the most sensitive taste or shocking the susceptibilities of those critical designers of natural landscape who sometimes find the most beautiful garden-plant out of place in the picture of silvan beauty and quietness they would create, unless from harmony of outline and of character acquired by natural selection and long association it happens to accord with its surroundings.

The Cornelian Cherry is a small tree, reaching sometimes the height of twenty feet, with slender, rigid branches forming a head of rather formal outline. It is one of the plants which cover themselves with flowers in early spring, before any of its leaves appear. The flowers are small and bright yellow; they are arranged, however, in compact, many-flowered clusters, and these, being scattered along the whole length of the branches, give to the plant, in the early days of April, a very striking and beautiful appearance. Here it is the first of the shrubs with showy flowers to blossom, the flowers appearing

almost a week earlier than those of the native Benzoin-bush, which the Cornelian Cherry resembles in general appearance at that period; that is, the two plants cover themselves with yellow flowers before any of their leaves unfold. The Cornel is, however, a more showy plant; it grows to a larger size and the flowers are of a brighter yellow. There is not much to say, however, of this Dogwood, once its flowers are fallen. The fruit, which is half an inch long, or rather more, is elliptical and bright red, and, individually, is as handsome as a cherry or a small plum. But, in this country at least, it is not produced in very great abundance, and the leaves so completely hide it that, practically, it makes no show at all, and there is nothing striking or remarkable about the foliage. One passes the plant without noticing it much, except in early spring, and its appearance leaves no lasting impression on the mind. But this, after all, is perhaps a merit, for plants without striking individuality are sometimes the most valuable, as they are available for many purposes and combinations where more distinct subjects might prove disturbing elements in a composition. The Cornelian Cherry is, therefore, a good plant to use in a garden or a shrubbery where a bright show of flowers would be agreeable in the very earliest days of spring, and where, for the rest of the season, a mass of pleasant, objectionable foliage would not destroy any of those natural and restful conditions of scenery a good garden should be made to afford.

C. Mas. is a native of central and southern Europe, and is one of the hardiest and most satisfactory of the trees of that continent which have been introduced into America. The wood has in all ages been celebrated for its strength, hardness and density, and it is from this peculiarity that the Cornels get their name of Cornus, derived from the Latin word meaning a horn. The origin of the English name of Dogwood is not so apparent. John Parkinson, who wrote voluminously and learnedly about plants in England two hundred years ago, says that the name came from the fact that the fruit of the English species (*C. sanguinea*) was so bad that it was not fit to give to the dogs. In his time the English Cornel had been called Hound's

Fig. 57.—A Fruiting Specimen of Drymophlæus olivæformis.—See page 330.

berry-tree also, and Hound's-tree and Dogberry-tree, so, for some reason or other, its canine affinities seem to have been firmly settled in the popular mind.

The fruit of *C. Mas.* is at least more valuable than that of the other species, although it appears to have been one of the coarse fruits which Circe threw with acorns and Beech-mast to the companions of Ulysses after their transformation. When it is thoroughly ripe the flavor is sweet, and not entirely disagreeable, and in Germany and other European countries it is used in making preserves, robs and liquors. It is not probable that it will ever find much favor in this country, or that the Dogwood will be planted for its wood, which by the ancients was much esteemed for the shafts of javelins, and in later days for the cogs of wheels and butchers' skewers.

There is a variety in gardens with light-colored fruit, and others with brightly variegated leaves. These last, however, are feeble and ugly plants of no merit whatever, except in the eyes of those persons who delight in vegetable monstrosities and like to see a garden filled with "freaks" and converted into a vegetable dime museum, useful enough, perhaps, to physiologists, but abhorrent to the lover of the beautiful.

Among the native shrubs which are not well known to gardeners there is a southern species of Viburnum which deserves a place in the garden. This is *Viburnum molle*, a plant which is widely scattered through the southern states, and which just reaches New England on the Massachusetts islands of Nantucket and Naushon. In habit and in general appearance, in the shape of the leaves, in the flowers and in the fruit it bears a strong likeness to the Arrow-wood (*V. dentatum*). It is not a handsomer or in any way a better plant than that familiar species, and its value lies in the fact that it flowers two weeks or more later than the other Viburnums. It serves, therefore, to prolong the flowering period of one of the most useful and beautiful of the groups of hardy shrubs, and Mr. Dawson is preparing to get together a large supply of young plants, with a view of introducing them on a considerable scale in some parts of the Arboretum.

A word about *V. dilatatum*, described and figured in Garden and Forest (vol. iv., page 150) a few months ago, will not, perhaps, be out of order here. The plants have passed safely another winter, and have flowered more profusely than ever before. There can be little doubt that this is a perfectly hardy plant in this climate and that it has the capacity of adapting itself to its new surroundings. It will only be planted by people who desire to make their gardens beautiful in the late autumn and early winter; in habit and in foliage it is not better, and, indeed, not as good as our native *V. dentatum* or the species which has just been mentioned. The flowers, although abundant enough, are much smaller, and they fall almost as soon as they open; and this Japanese species has really little to recommend it as a flowering-plant. But the fruit is splendid, brilliant, abundant and long-hanging. There is no shrub of recent introduction that equals it in the beauty of its fruit, and there is hardly one among the innumerable varieties found in this collection which surpasses it. This certainly is one of the plants which need to be known only to become one of the most popular garden-plants of the country.

In another issue of these notes something will be said of the new species of Lilacs as they appear in the Arboretum, where most of them have now been successfully cultivated for several years.

Arnold Arboretum. *P. C.*

Hardy Plants.

It is, perhaps, true that no doubt now remains as to the hardiness of *Heuchera sanguinea*, but it ought to be known that there appear to be varieties in cultivation that are scarcely worth planting, being but poor in comparison to the better form that every garden should possess. If any reader is disappointed with his plants it is quite possible these are poor varieties, and, as seed is produced so freely, there is considerable variation in the seedlings, both in foliage and flowers, and some plants have been raised of exceptional merit.

One of the prettiest Campanulas we know is *C. punctata*, which has been in bloom several weeks; its flowers are large, on stems eighteen inches high, and are prettily spotted within; it is a nice companion plant for *C. macrantha*, with large, deep, blue flowers, and *C. Van Houttei*, with flowers of a paler blue. These three Bell-flowers are all in bloom together, are hardy and good perennials. *C. Van Houttei* does not seed, as it is said to be a hybrid, and must always be propagated by division.

A charming little Pea is *Lathyrus tuberosus*. It is now flowering abundantly, and the clusters of deep red flowers are very pretty. I am indebted to an English correspondent for my plants, and they seem perfectly contented and may prove hardy. The roots are tuberous, and much resemble those of the Ground Nut, *Apios tuberosa*. *L. tuberosus* appears to prefer to trail rather than climb; it is at present not more than eighteen inches high, and covered with flowers and buds.

We read much of hardy Gladiolus, but there are few indeed that are quite trustworthy in this respect. I have found *G. Saundersii* to be hardy and to come up and flower year after year when established. This, I believe, is well known, but we have had, during the past month, a pretty clump of *G. Byzantinus* in flower from bulbs that were planted in a border last fall and not protected in any way. The flowers of *G. Byzantinus* are very pretty and showy, and always early; in fact, the plants resemble *G. Colvillei* in every way excepting the color of the flowers, which is crimson, with white stripes on the lower part of the flower. Bulbs can easily be obtained in the fall from dealers, and, when once planted, need no further attention.

Nice clumps of the pretty Himalayan Primrose, *P. rosea*, were sent here last fall, and one of these was risked in the open ground in moist soil, and I fully expected this would be the end of it; but in May, after the potted plants had been past several weeks, the little rose-colored flowers began to peep above the ground, as is their way before the leaves grow, and our entire stock will be left out another year alongside of a little colony of *P. denticulata nivalis*, for which I am indebted to Herr Max Leichtlin, who sent me seeds last fall. Many of these plants are now in flower, which are pure white. The typical plant is well known to be hardy in Massachusetts, and is also of Himalayan origin, and we therefore have reason to hope that the variety will prove to be useful.

Achillea serrata plena, The Pearl, which gave promise last year of being a desirable border-plant and of great use for florists' work, has this season usurped more than a square yard of space to itself and will certainly have to be removed, for at its present rate of increase one can hardly contemplate its progress for another year without alarm. The danger is more threatening when we remember that last year each plant bore about three flower-stems, while now there are at least fifty to each clump, and this without any special cultivation or attention. It is a plant that must be placed where it cannot elbow its feebler neighbors out of their rightful places.

South Lancaster, Mass. *E. O. Orpet.*

Currants.

A careful re-examination of my Currants shows that the crop will be a moderate one, but it is profitable even when it does not exceed one-third of what the bushes ought to yield. For the best crop the ground must be in good tillage and kept well fed. It is absolutely essential to have good drainage. In wet soil the bushes heave in winters, and are not healthy, yet the Currant must have moisture. It is well to give them mulching after a second hoeing. Many of mine grow in a vineyard, between rows of Grapes, from which they get partial shade. These bushes do well.

In pruning I do no more than cut out weak new shoots and old wood that begins to be disbudded or decayed. I have never pinched back bearing shoots. I prefer to have high bushes, removing very low limbs, which often bend down with fruit and soil it. The top should be only reasonably opened to the sun.

Of the red varieties I place Versailles and Fay together at the head. The Versailles grows stronger and taller, and bears with me more profusely than Fay. In quality I find no difference. In size the Cherry is about identical; but the stems are inclined to be very short; the fruit in bunches, and not, therefore, nearly as profitable as the others.

Red Dutch, Prince Albert and Victoria do not differ very greatly in quality, but the real Red Dutch is much the smallest Currant. Prince Albert and Victoria are late and profitable. But the demand is almost universal for "Cherry" currants—a name that in market covers Fay and Versailles. For family use some of the later sorts are valuable.

The best in quality of all currants is White Grape; for the table it is delicious. Next to it I place Versailles and Fay. White Dutch is very rich, but smaller and more seedy. Its distinctive feature is its transparency, and a golden hue instead of white. For family use the White Grape should be planted largely.

The market demand for white currants is increasing steadily. It is a curious fact that, if scalded before pressing, the whites make a rich red jelly, not as dark as that from red currants, but very handsome. Those who make jelly should call for

white currants. Those who eat currants will soon learn to prefer the whites.

Black currants I have mostly discarded as unprofitable for market. One grower, with an acre, can supply the demand of a whole county. Lee's Prolific was heralded as a great advance on Black Naples; it is but little better. Crandall, a native fruit, is a sprawling grower. It is possible that we shall yet get from this stock, or by crossing, an improvement, but the Crandall, as I know it, can make no claim to superiority.

The currant-worm this year came in constant succession from May 12th to July 1st. Its feeding capacity is enormous. It is possible to kill vast numbers by examining the leaves for eggs before they hatch. The after-remedy is the well-known hellebore, sprayed or sprinkled on as soon as the worms begin. As many as four applications are often needed to keep down the pests. Guinea-hens eat the worms, and the currants too. If the bushes are defoliated one year the buds for the next year are debilitated, and a short crop will be produced.

The demand for currants has steadily increased with the demand for all other small fruits. After the cherry it is the most wholesome fruit for dyspeptics. It ships well, and it may remain long on the bushes. Unlike the strawberry, and especially the raspberry, it never hurries us. The opening price in market is from eight to ten cents a pound, wholesale. It seldom drops below five. I have this year given up baskets and sent all my currants out in crates. It will become the only method shortly. In the small boxes they are not crushed, and if picked wet they get dry, while in large baskets they mold.

Clinton, N. Y. *E. P. Powell.*

Notes from the Harvard Botanic Garden.

Utricularia montana.—This charming little "Bladderwort," first introduced to British gardens through a Mr. Ortgies in 1871, occurs freely in South America and the West Indian islands, being epiphytic on the mossy trunks of trees in the mountainous regions. In cultivation it is usually associated with Orchids, and this fact, with the peculiar structure of the flowers, leads many of the uninitiated to consider it a member of that family. It belongs, however, to quite a different order, *Lentibulaceæ*, and, although lacking the brilliant colors found in many Orchids, it is still pretty and interesting. The roots consist of numerous greenish tubers, with fine thread-like white rootlets. The pale green, petiolate, oblong-lanceolate leaves proceed from a cluster of these tubers, and are about six inches long. The scape, almost twice their length, is slender, erect, bearing from three to five flowers two inches in diameter, with a calyx of two triangular, cordate lobes, pale green, and corolla two-lipped, the upper one white and semicircular, the lower white in front and of oval outline, raised and blotched with yellow at the base, with an incurved spur, tapering to a fine point, beneath. The plant blooms at various periods of the year, but most freely during the early summer months. It thrives luxuriantly when suspended from the roof of a stove, close to the glass, in a basket containing crocks, peat and sphagnum in equal mixture, a quantity of the latter being added by way of surface-dressing. Water should be given freely at all seasons, and propagation is readily effected by division of the roots.

Hymenocallis speciosa and H. ovata.—When seen apart it is rather difficult to state in what particulars one of these plants differs from the other. Both bloomed together at this place recently, giving the opportunity of comparing their characters and merits. The latter plant may always be distinguished from *H. speciosa* by its leaves; these are from twelve to eighteen inches in length, oblong, broadly lanceolate, tapering to a petiole-like base one-third of their entire length, somewhat leathery, and of a pale, glaucous-green color. Those of the former, on the other hand, are fully six inches longer, oblong, obtuse, the stalk-like base one-half their length, dark green and succulent. The flowers, however, afford the safest means of identification. Those of *H. ovata* are pedicillate, while those of *H. speciosa* are as distinctly sessile. *H. ovata* flowers the most freely, and should be given the preference on this account. These plants require stove-treatment, but they should not be dried off as severely as most other bulbous rooted plants. They like rich soil, and, in summer, abundance of water, which may be varied occasionally with advantage by the application of liquid manure.

Cambridge, Mass. *M. Barker.*

Cucumbers.—Whether for pickles or slicing, if triangular in general shape of cross-section, as most of them are, the sides should be concave outward, instead of convex, the latter shape always indicating a hard and often bitter strip along the centre of each side where the seeds are attached. The fruit should also be nearly the same size throughout its entire length, any depression or seedless neck being indicative of hardness and bitterness of flesh at that point. In pickling cucumbers, the color is a very important point. It should be as deep, and extend as uniformly over the fruit, as possible. Contrary to the usual opinion, we do not think that coarse spines or prickles indicate crispness of flesh, as the most crisp and brittle sort we know of is the Parisian Pickling, in which the spines are exceedingly small.

Lettuces should be divided into two classes, according to the method of use. If to be served with oil or similar dressing, the leaf should be thick, brittle and crisp rather than tender, and should have a decided flavor—may even have, when first picked, a decided bitter taste, this disappearing when served. Most lettuces of this class form distinct heads. In the second class, the lettuce is cut up with vinegar, sugar, etc., and here tenderness is the great consideration and outweighs all others. No bitterness is admissible, and, as a rule, there is but little flavor. It is a disadvantage for lettuces of this class to form a distinct cabbage-like head, as the thin tender leaves lose all their crispness and beauty of color when crowded into a dense head. A cluster of large leaves is much more desirable.—*Professor W. W. Tracy, before the Michigan Horticultural Society.*

Correspondence.

The Red-flowered Dogwood.

To the Editor of Garden and Forest:

Sir,—A correspondent says (page 308): "There is a variety (of *Cornus florida*) in cultivation with pink, instead of white, flower-bracts, which is really a handsome plant, although considerable prejudice has been created against it by the absurd overcoloring of the bracts, as they appear in illustrations in the sale-lists of nurserymen who are seeking to make a market for it."

As our firm is responsible for these colored plates, permit us to say that when we received the proofs from Rochester, after our strict caution that nothing should be overwrought, we ourselves imagined they were overcolored. We cut some of the drawings, so that only the colored portions of the flowers should remain, and put them on the plants beside the real flowers, and no one could tell which was the painted flower and which was the genuine. This test will hold good to this time.

In justice to your correspondent, however, it may be said that the tint on transplanted plants, or plants not in vigorous health, is lighter than that on vigorous established specimens, and that, after a flower has been opened a few days, the bracts lose color. We are satisfied that he has seen them much paler than the colored plates represent, but if he will call on us when the plants are in blossom we shall be glad to have him test the pictures with the colors on our plants, and are sure he will acquit us of "absurd overcoloring" afterward.

Germantown, Pa. *Thomas Meehan & Sons.*

The Destruction of the Pines.

To the Editor of Garden and Forest:

Sir,—As one reared under the shadow of the eternal Pines, and loving them as only the objects familiar to our childhood are ever loved, as well as one of the great American people who are being defrauded of their birthright, I desire to protest against the wholesale destruction of the Pine-forests now going on all over the country, and particularly in my own state of Georgia. In traveling the other day from Macon to Brunswick I passed through the heart of what was once the great Pine region of the state, and, notwithstanding a long and sad experience of the ways of that most destructive of animals, "the great American developer," I was amazed and appalled at the work, not of destruction merely, but of utter annihilation and extinction that has been accomplished within the last twenty years. During the whole distance traversed of nearly 200 miles there is not left standing on either side of the railroad, as far as the eye can reach, a single stick of Pine fit for timber; and not only this, but Nature's generous and patient efforts to repair the waste are thwarted by the greed of the turpentine distiller, who comes along and destroys what the axe of the lumberman has left. I saw thousands of acres of saplings, some of them less than five inches in diameter,

stripped for turpentine, and thus practically destroyed. The Pine is a forgiving victim, and does its best to protect its destroyer from the effects of his own folly, for at the very feet of the dying parents a new generation of young conifers springs up that would, in time, repair the havoc made by the saw-mill and the turpentine-still, but their greedy enemy will not suffer it. Relentless as Herod, he slays the infant Pines by wholesale, and, like the stupid woman in the fable, who destroyed the goose that laid her golden eggs, he converts his God-given wealth of noble forest into a barren waste of sand and Palmetto scrub.

And thus, from Georgia to Maine—nay, to far-off Nova Scotia—the work of desolation goes on; from Georgia to Maine the mouldering, blackened stumps tell their mute tale of havoc and ruin. I have seen the Kennebec, from Augusta to Bath, so covered with logs that you could hardly see the water; poor, little, scrubby, spindling logs they were, too, that told their own sad tale of the slaughter of the innocents of the forest.

In most of the states there are game-laws for the protection of useful animals, and if these are compatible with democratic institutions, then, why not forest-laws as well? We have in Georgia a closed season for shad and partridges, during which it is unlawful to destroy or molest them, and the Legislature ought, at its very next session, to enact a law making it a misdemeanor, under heavy penalties, to cut or mutilate for the saw-mill or the turpentine-still any Pine-tree that has not attained a diameter of at least eighteen inches. If some such step is not taken, and taken speedily, the present generation will witness the virtual extinction of the most beneficent of all our noble forest-trees, the health-giving, balm-distilling, music-murmuring Pines.

Macon, Ga. *E. F. Andrews.*

Narcissi in Ireland and Elsewhere.

To the Editor of Garden and Forest:

Sir,—After reading, in the horticultural journals, the glowing accounts, by Mr. Burbridge, Mr. Hartland and others, of the luxuriance of the Narcissi in Ireland, it is comforting to read in the communication from John Quill (Garden and Forest, p. 322), of the same favored isle, that Daffodils should not grow too luxuriantly—but just luxuriantly enough. While his points seem to be commercial ones in trying to point out the superiority of Irish-grown bulbs, they are of interest to growers who have nothing except pleasure in view.

It is difficult to understand why, cultural skill being equal, Irish bulbs should be better than others, and no one doubts the skill of the Dutch in all that pertains to bulb-culture. If fat bulbs are unsatisfactory they would not long continue to grow them so. The early maturition of bulbs may be desirable for shipment, but is it of so much importance for other purposes? Take, as an extreme case, the Polyanthus section. These are, even now, scarcely showing signs of maturity, yet the Dutch send the bulbs here in immense quantities every year, firm, hard, bright-coated and sure to bloom. The early maturing of this section, at least, is apparently of not much consequence, for the Chinese bulbs sent here every fall show no signs of being ripened off; they are lifted with roots still alive, a coating of mud is daubed over these, and they are seemingly shipped as soon as this is dry. Surely no bulbs bloom more freely than these. On examination of a collection of Daffodils it will be found that they vary very widely in their time of dormancy and starting into growth. General rules will hardly apply here, but if early maturity is essential, it would appear that the Italian growers have by far the best of it, and they ought to lead the trade. Stock from Italy, however, is not so superior as to lead us to consider early ripening of first importance.

The buyer of new bulbs may well make the general rules to look over his new stock and carefully examine for maggots, and separate the soft ones for special care in the way of drier treatment than that needed by the main stock. Like the Dutch, not all of us "have the soil, you know," but we wish to know why Daffodils do uniformly well in one place and fail miserably in others. For an instance, *N. poeticus* grows finely in one place in my garden, blooming year after year; in all other places it grows and throws up flower-spikes which uniformly go blind. John Quill will have the thanks of many besides myself if he will tell us how to flower the Poet's Narcissus uniformly. Thanks to the commercial growers, we know pretty well the main points of the successful cultivation of the leading Narcissi, but, in my limited experience, I find that these points must be modified somewhat in practice. Ireland may be so fortunate as to possess large tracts happily adapted to the Daffodils, but there is no such uniformity, even in my small garden, every yard of which, I sometimes think, has different capacities. My little lot of Narcissi is not yet so happily planted as to show no failures, and I regret to say that I see no reason to think that I shall be successful with them by following any general rules, except keeping them vigorous and growing as long as possible. The time of blooming of Narcissi in the open with me seems to depend on the state of the season, not on the time of planting.

Elizabeth, N. J. *J. N. Gerard.*

A Weeping Apple-tree.

To the Editor of Garden and Forest:

Sir,—Some twenty years ago I planted an Apple-tree hedge, which it seemed best to remove after a few years. But one tree in the hedge had shown a marked tendency to droop its limbs, and was spared when the cutting took place. This tree now sweeps the ground over a space fifteen feet in diameter, and would spread farther if allowed. The habit is more marked than that of Weeping Linden, Cherry, Ash and other trees that I have planted. If the habit could be perpetuated by grafting, this variety would be an acquisition for those who have a fancy for such trees. I have no strong liking for them personally, and certainly they should always be used with caution.

Clinton, N. Y. *E. P. P.*

Recent Publications.

The Report of the Chief of the Division of Forestry deserves a more detailed notice than the mere mention it has received as a part of the Report of the Secretary of Agriculture. At the outset Mr. Fernow makes it clear how the work of the division has grown in the direction of giving information in answer to requests. To indicate the character of this part of the correspondence, a classified list of subjects is given, which covers a page. Under the heads of Technology, Forest-influences, Forest-planting, Forest-botany and Forest-management are embraced an immense range of topics, and the questions asked illustrate, in a striking way, the importance, variety and intimacy of the relations which forests bear to human society and life. Under the head of Statistics come inquiries as to the timber area of the United States, the present and future supply of various kinds of hardwood, and a hundred more, concerning which the information furnished must be very imperfect, because of a lack of means for acquiring it. We, therefore, agree with Mr. Fernow that it is a matter of regret that the opportunity afforded by the machinery of the eleventh census was not made use of to obtain some more definite data as to the present condition of our timber-resources. Since our forest-products amount in value, as raw materials, to not less than a quarter of the value of all the raw materials manufactured in the United States the subject is large enough to justify investigation. Mr. Fernow is certainly correct in saying that we ought to know, from decade to decade, what changes in our forest-area, and in their conditions, have taken place, just as we think it worth while to ascertain and compare the areas and crops of agricultural land, and such knowledge is needed more and more as the area of virgin timber-land shrinks and falls into the few hands which control the lumber-supply of the nation. When the division is asked to supply information as to where certain kinds of timber are found in abundance, or many other questions of this sort, only a very general and unsatisfactory reply can be made. In addition to the melancholy fact that the government does not know how much timber-land it possesses, nor what is the quality or the value of the timber on that land, we are reminded, too, that there is a total absence of forest-management on these timber-lands. Under such conditions the Division of Forestry is itself an incongruity. It seems absurd that there should exist a department whose function it is to give advice, which is never followed, about the management of a property which its owner, the government, does not pretend to manage, and about the extent and value of which the government has no definite knowledge, and makes no effort to obtain any such knowledge. All these discouraging conditions have been pointed out again and again by Secretaries of the Interior, as well as Chiefs of the Forestry Division, and yet our forest-resources are wasting away, and the protecting timber on our mountain slopes is disappearing, to the peril of the lives and property of those who live below, and nothing practical is done to quench incendiary fires or arrest the trespasser's axe.

Besides the information that has been imparted by letters in reply to specific inquiries, the Chief of the Division has addressed various associations, such as farmers' institutes and

forestry associations; circulars, too, have been issued, one, for example, giving directions for the growing of seedlings, and another for the treatment of young seedlings in the nursery. The important bulletin prepared by Mr. Tratman on the substitution of metal for wood in railway-ties, and issued during the year, has been previously noticed. The monographs on the life-histories of conifers are again promised. Many of them have been prepared for some time, and their publication should be no longer delayed. In connection with technological investigations, which are still in progress, this work is perhaps the most promising yet undertaken by the department.

One of the great difficulties in introducing good forest-management is the fact that no competent forest-managers can be found. Undoubtedly there will soon be a demand for men of training in this particular occupation, but it is difficult to see how forestry can be studied here to advantage so long as there is no practical illustration of good forestry, and, on the other hand, foresters imported from abroad will find it difficult to adjust their methods to the conditions existing here. Mr. Fernow, therefore, advises that young men with considerable preliminary preparation should go abroad and acquaint themselves, by study in the various academies and in practical work in the woods, with the theory and practice of forest-management. This might be accomplished in one or two years abroad by any one who is fitted with the necessary botanical and technical preparatory education. Persons who wish to prepare themselves for such a course may find very considerable facilities for this study in the libraries and museums of the department, and a list is also given to show what facilities are offered in the different states at the experiment stations and agricultural colleges on subjects which are necessary to a preliminary course in forestry.

Many other subjects are touched upon in this brief report which we have not space to notice in detail. Most interesting of these, perhaps, is the chapter on the wood-pulp industry, which has had a most rapid development in a few years. It certainly has not yet reached its full development, and perhaps Mr. Fernow is correct in saying that its expansion during the next few decades may bring revolutionary changes in our wood consumption, and modify to a considerable extent the practice of forest-management.

The report closes with the statement that increased appropriation will make it possible for the division to devote more time to missionary work, which is still sadly needed, before any intelligent forest-policy can be adopted in the United States.

Periodical Literature.

In the *Popular Science Monthly*, for July, Professor C. S. Ashley gives an account of "Our Agricultural Experiment Stations" which should interest those who see the reports from these stations constantly referred to in Garden and Forest. He traces their establishment to Samuel W. Johnson, now Professor of Agricultural Chemistry in the Sheffield Scientific School at New Haven, and Wilbur O. Atwater, now Director of the office of Experiment Stations in the National Department of Agriculture, who, having studied in the agricultural stations of Germany, made, in 1873, "the first direct effort to start an agricultural experiment station on this continent." This effort was made in Connecticut, and the first American station was there established, at Middletown, in the year 1875. In 1876 another was started in California, and in 1877 another in North Carolina, and in 1887, when the Hatch act passed Congress, there were eighteen stations spread through fourteen states. "This act made provision for an appropriation of $15,000 a year to each state or territory that would accept the trust, to establish a station in connection with its agricultural college, or to aid such stations already established. All of the states, except Montana, Washington and Idaho, have taken advantage of the act, as have also New Mexico, Arizona and Utah. Some have more than one, and some, who have only one regular experiment station, have organized one or more branch stations, located in different sections of the state. If these branch stations be excluded, there are now fifty-three experiment stations in the United States; while if these be counted, there are sixty-nine." Four hundred and twenty-three persons are now employed on the scientific staffs of these stations, including agriculturists, chemists, horticulturists, botanists, entomologists, veterinarians, meteorologists, biologists, microscopists, physicists, mycologists, viticulturalists and geologists. Each station is independent of the others, but a central bureau at Washington collects and publishes summaries of their work for the use of the public, special bulletins for the station-workers themselves, and reports and monographs of various kinds, and serves as a "medium of information and exchange." During the present year about $1,000,000 will be expended on these stations, and reports will be sent direct to nearly 400,000 farmers—and all this is a growth of the last fifteen years.

It seems odd to read that "the greatest obstacle which the stations have met has been a demand from the farmers for immediate results and a prejudice against the laboratory and its work"; but, we are told, "this gradually disappears as the farmer becomes more and more familiar with science." The way in which fraudulent fertilizers have been driven from the market by the action of the stations is named as one conspicuous instance of the practical good they have done, and others are the improvement in the methods of extracting sugar from cane in Louisiana and the introduction of the process of "Pasteurization" of wines in California, which does away with the use of antiseptics of any kind, while the new facts, theories and interests which the bulletins bring into the farmers' lives have, apart from their practical outcome, an educative and cheering influence which can hardly be overprized. Of course, at first it was difficult to get competent scientific workers for the various stations, but this hindrance is gradually disappearing.

In the same number of the *Popular Science Monthly* Mr. Joseph F. James writes of "Pollen and its Uses." We quote a single paragraph as a sample of the interest of all the others. "The immense number of pollen-grains," he says, "produced by a single flower apparently militates against the saying that Nature allows nothing to be formed but what is needful. It seems, indeed, a vast waste of material to have such a multitude of grains when so very few would answer the same purpose. In a single flower of the Peony there are about three and a half million grains; a flower of the Dandelion is estimated to produce nearly two hundred and fifty thousand; the number of ovules in a flower of the Chinese Wistaria has been counted and the number of pollen-grains estimated, and it is found that for each ovule there are seven thousand grains. While few fall below the thousands, many rise far above the Peony in point of numbers. These are the wind-fertilized flowers, and here Nature must provide for an immense loss of material. Darwin says that 'bucketfuls of pollen have been swept off the decks of vessels near the North American shore. . . . Kerner has seen a lake in the Tyrol so covered with pollen that the water no longer appeared blue. . . . Mr. Blackley found numerous pollen-grains, in one instance twelve hundred, adhering to the sticky slides, which were sent up to a height of from five hundred to a thousand feet by means of a kite, and then uncovered by means of a special mechanism.' The so-called showers of sulphur which have at times visited various cities, notably St. Louis, are nothing but clouds of yellow pollen blown from Pine or other forest-trees from some distant place. Perhaps, out of millions of grains thus scattered far and wide, only a single one may be of service. As if to compensate for this expenditure of pollen in some plants there are others in which the amount is very limited, and where nearly every grain is made to count. These are known as cleistogamous flowers, a term applied to those which always remain in the bud. These flowers are found in plants belonging to about sixty different genera of various orders, and generally in those species which at the same time produce the normal and conspicuous flowers. These large blossoms are often sterile, and the plant must depend upon the cleistogamous flowers for its seed. In the Wood-sorrel (*Oxalis acetosella*) these flowers have each about four hundred pollen-grains; the Touch-me-not (*Impatiens*) has only two hundred and fifty, and some Violets only one hundred. Even before leaving the anther-cells the grains in these cases have protruded their pollen-tubes; these seek the pistil and penetrate to the ovules. It might perhaps be supposed that, as the seed can be produced so easily, all plants would have cleistogamous flowers. But here comes into play the fact that that continual close fertilization is a great detriment, and not a benefit, and that it is better in the end that flowers produce an apparently wasteful amount of pollen and take the chances of a cross, than to be more economical and be perpetually self-fertilized."

As a companion to this article on pollen, the *Monthly* gives, from the *Cornhill Magazine*, one called "On the Wings of the Wind," which explains some of the methods used by plants in scattering their seeds. To hint at the variety of these methods we will merely quote the author's declaration that among the *Compositæ* alone "I can reckon up more than a hundred and fifty distinct variations of plan among the winged seeds known to me in various parts of Europe."

Notes.

A correspondent of the *Rochester Post Express* states that 80,000 plants of Roses, embracing 150 varieties, are growing in one block in the nurseries of Messrs. Ellwanger & Barry, while in another field near by there are 20,000 plants.

The growers of early fruit in California this year reaped a rich harvest. Early cherries, peaches, apricots and pears brought high prices in eastern markets, and some of the earliest peaches came from the northern part of the state.

Number one of *Meehan's Monthly* was issued on the first of July. It contains a colored plate of *Rhododendron maximum* and sixteen pages of reading-matter, and resembles very much, in typographical appearance, the *Gardeners' Monthly*, when under Mr. Meehan's direction.

Monsieur A. Lothelier, in a note recently laid before the French Academy of Sciences, declared his belief that in *Robinia Pseudacacia*, *Ulex Europæus*, *Berberis vulgaris* and other plants the formation of spines is dependent upon the action of light. If grown where the light is not strong, plants of this sort show few spines, while when the light is more powerful the spines are more numerous, better developed and more markedly differentiated.

Les Cypripedium et Genres Affinés is the title under which Angiolo Pucci publishes, in Florence, a volume of 218 pages, a history of Cypripedium, with a description of the species and the methods used for their successful cultivation. It is a French translation, or rather an adaptation, of Veitch's "Manual of Orchids," already noticed in these columns, and will be found interesting and valuable to the cultivators of these popular plants who are not acquainted with the English language.

The *Société Nationale d'Horticulture de France*, the chief horticultural association of that country, now includes nearly 2,500 members, of whom 914 reside in Paris, 379 in the Department of the Seine, and 982 in the remaining parts of France, while 175 are foreign associates, some of them living in lands as distant as China. The Society is divided into six committees: one each for fruit-culture, for the culture of ornamental trees, for horticulture proper, for vegetable culture, for artistic gardening, and for garden utensils.

The famous liqueur called "Chartreuse," from its makers, the monks of the Carthusian order, is composed of brandy, flavored by a mixture of herbs, the secret of which is carefully kept within the bosoms of the order. The Benedictine monks manufacture a similar beverage which, likewise, is called by their name; and now, we are told, the monks of Tre Fontane, near Rome, the place which has recently become famous for its vast plantations of Eucalyptus trees, are introducing a liqueur, the characteristics of which are explained by the name selected for it—"Eucalyptica."

The Proceedings of the American Forestry Association, at its late meetings in Quebec and Washington, have been published in a neat pamphlet of 112 pages. Summaries of several of the papers have already been given in this journal, but the matter is all well edited and of excellent quality. In a prefatory note it is stated that the association does not hold itself responsible for the views expressed at its meetings or published afterward in its reports. Its platform is offered, however, for the discussion of all important questions connected with forestry, and the encouragement of such discussion is most commendable. Indeed, this is the only way to promote the aims of the society, which are (1) Education, or leading the public mind to see the necessity of prompt and thorough reform in the treatment of American forests, and (2) Legislation for the enactment of proper laws under which to accomplish this reform. The association now has an earnest membership from thirty states and two provinces of Canada, and it is in every way worthy of public support. This report deserves a wide circulation, and persons who are not members of the association can secure copies of it for fifty cents by addressing Charles C. Binney, 218 South 4th Street, Philadelphia.

Writing from Chicago, with regard to the preparations for the World's Fair, a correspondent of the *American Architect and Building News* recently said that the work of dredging was being pushed with all speed, so that it was expected that the lagoon would be completed by the end of June, and also the grading which would make the sites ready for the foundations of all the buildings. "Over 900 men," he continued, "have been at work in this especial department, and three large steam-dredges have been constantly at work. Over 100,000 plants have been shipped to the place and are being cared for by a large force of gardeners. The proposed wooded island is already converted into a nursery, while on one part of the island it is proposed to lay out a primeval swamp, such as formerly occupied the site of Chicago, the plants for the purpose being already on the grounds. Three greenhouses have already been built and a stovehouse for Palms, and preparations are being made to receive wild herbaceous and aquatic plants from all parts of the country. Sixty thousand Willow cuttings are already in the ground, 10,000 of them being sent as a gift by the Park Commissioners of Buffalo, New York. Mr. Olmsted has presented the Exposition with Bamboos from Asheville, North Carolina, near to the park he is there laying out for one of the Vanderbilts."

The new body incorporated in Massachusetts by Chapter CCCLII. of the Acts of the last Legislature "for the purpose of acquiring and opening to the public, under suitable regulations, beautiful and historical places and tracts of land within this commonwealth," has organized by adopting a code of by-laws and electing as its first President the Honorable George F. Hoar, of Worcester. The Honorable William S. Shurtleff, of Springfield, is Vice-President, Mr. George Wigglesworth is Treasurer, and Mr. Charles Eliot is the Secretary. The direct management of the affairs of the corporation is vested in a Board of Control consisting of Mr. Philip A. Chase, of Lynn; Mr. Charles S. Sargent, of Brookline, and Dr. Henry P. Wolcott, of Cambridge, with whom are associated the Secretary and Treasurer. The corporation is empowered to acquire by gift, devise or purchase, beautiful and historical places in Massachusetts, and to hold the same free of taxes as long as the reservations are open to the public. Under the by-laws any person who subscribes $10 to the funds of the corporation becomes entitled to receive the annual report and an invitation to an annual conference with the Trustees. Clubs and societies may become entitled to send a delegate to the annual conference on the same terms, and it is expected that the Historical and Natural History Societies and the Village Improvement Societies of the state will in this way be able to assist a cause in which they are naturally interested. Any man or woman, whether a citizen of Massachusetts or not, who desires to take part in the work of this corporation may do so by communicating with the Treasurer, Mr. George Wigglesworth, 89 State Street, or with the Secretary, Mr. Charles Eliot, 50 State Street, Boston.

The last part of the *Contributions from the United States National Herbarium*, being Volume II., No. 1., to reach us contains the first installment of Professor Coulter's Manual of the Plants of western Texas, and embraces the *Polypetalæ*. The purpose of the manual, the author tells us, is to bring together and make easily accessible the scattered information which exists concerning the flora of western Texas, a region of great botanical interest as the meeting-place of the plants of the true North American flora with the peculiar forms of northern Mexico. The manual is intended to include all Texas plants found west of the ninety-seventh meridian. The introduction of useful analytical keys, local names, and the mention of the economic uses of the plants, greatly increases the value of the work which has been prepared, not only as a reference-book for botanists, but as a hand-book for Texas students, for which purpose it seems admirably adapted. It is to be regretted that Professor Coulter has not adopted some uniform system of nomenclature, and it is not easy to understand why, for example, if Marshall's name for the Fragrant Sumach, *Rhus Canadensis*, is to be taken up, his names for the Sweet Buckeye and for the Chicksaw Plum should be passed by in favor of much later ones. The supposition is that an attempt was made to follow the plan of nomenclature adopted in the last edition of "Gray's Manual," of which Professor Coulter was one of the editors, and in which appears a considerable number of plants under names sanctioned by long usage, although not the oldest, and, therefore, in danger of change at the hands of subsequent authors. But even the names of the "Manual" are not always adopted in this new work, for, in turning over the pages very hurriedly, the eye falls on *Cratægus arborescens*, Ell.—a plant which was correctly referred, by Watson and Coulter only last year, to the *Cratægus viridis* of Linnæus. Such details, of course, do not detract from the working value of a manual of this character, except in so far as they continue and extend the confusion of botanical nomenclature and complicate synonymy.

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The Red Oak.

THE Red Oak is one of the largest and most beautiful of the deciduous trees of the American forest. It is the largest and the most widely distributed American representative of the so-called Black Oaks—that is, of the Oaks distinguished by the acute bristle-pointed lobes of their leaves, by the slow development of their fruit, which requires two seasons in which to reach maturity, and by their brittle and porous wood. There is no other American Oak of wide distribution which varies so little as the Red Oak in the form of its leaves and in the character of its fruit; and it is in western Texas only that it occasionally assumes an appearance which is puzzling to botanists, leading them to suppose that through this extreme form it may be possible to join it specifically with some of the other Black Oaks.

From Canada to Texas the Red Oak varies but little in what may be called essential characters; individuals are large when the soil is rich and moisture is abundant, and they are small and stunted in barren soil unrefreshed by copious rains. The leaves and the fruit are larger and better developed when conditions of growth are favorable, but in form they are very constant, and it is easy to distinguish the Red Oak, with a little practice, at all seasons of the year.

In habit of growth it varies considerably, but not more than other trees; for it must be remembered that the habit of a tree—that is, the form of growth a particular individual assumes—is dependent entirely on the local conditions and surroundings in which the individual is developed. It is exceptional when all the individuals of a tree-species assume the same habit of growth. Most trees form tall slender stems when other trees crowd them, as in the forest, and cause their lower branches to die from the insufficient supply of sunlight which reaches them. An individual of the same species standing by itself will send out long stout lateral branches which give to the tree an entirely different appearance. In the case of some trees the habit of individuals is influenced by the character of the soil in which they grow, and age, of course, brings many changes in form and general appearance to trees. It is for these reasons that the portrait of an individual gives only a partial and therefore an unsatisfactory idea of the general appearance or habit of the species, and why a hundred portraits would be necessary to give anything like a comprehensive idea of the appearance of a tree like the Red Oak, for example, as it appears in different parts of the country growing under the different conditions to which it is subjected.

The power to recognize trees at a glance without examining their leaves or flowers or fruit as they are seen, for example, from the car-window during a railroad journey, can only be acquired by studying them as they grow under all possible conditions over wide areas of territory. Such an attainment may not have much practical value, but once acquired it gives to the possessor a good deal of pleasure which is denied to less fortunate travelers.

The Red Oak (*Quercus rubra*) grows naturally in both rich land and in light porous gravel. Usually it selects a soil intermediate in character, between that preferred by the White Oak and the sterile soils occupied by the Black Oak. It is the only Oak which reaches as far north as the northern part of Nova Scotia, while westward it extends almost to the limits of the Atlantic forest region. It is one of the commonest trees in all this great territory, and grows from the immediate neighborhood of the coast to higher elevations on the Appalachian Mountains than any other Oak tree; it is as common west of the mountains as it is on the Atlantic sea-board, and it abounds in the south as well as in the north. The Red Oak cannot secure a foothold in undrained swamps or on the inundated banks of rivers, but in all other situations, from Cape Breton to the Rio Colorado, it can hold its own wherever trees grow. It is west of the Alleghany Mountains that the Red Oak, growing on rich intervale lands along the larger streams which flow into the great tributaries of the Mississippi, can be seen at its best as a timber tree. Here specimens can be found a hundred and fifty feet high, with stems as straight as arrows, free of branches for sixty or seventy feet from the ground, and five or six feet in diameter, above the great swollen buttresses which are characteristic of large individuals of this species. Such noble specimens occur, too, in the forests which clothe the slopes of the mountains of the south, but at the north, where the deciduous forests which Europeans found here when they discovered America have been replaced by a second growth, the Red Oak assumes, usually, a different habit. The trunk often separates, fifteen or twenty feet from the ground, into several stout branches which grow in an upright direction, and, gradually spreading outward, form a wide head in the shape of an inverted pyramid. Such a form indicates that the tree has grown in good soil and that it has succeeded in securing a fair amount of space in which to develop its head. In poor soil, and when crowded by other trees, the Red Oak makes a narrow head of small branches and does not grow to a large size. Sometimes it branches low, sending out at right angles with the trunk great wide-spreading limbs, like a pasture White Oak, making a round-headed top. Such specimens are not common, and perhaps represent the noblest type of individual beauty the species is capable of.

The bark of the Red Oak is dark brown and deeply furrowed on the trunks of old individuals; it is smooth and gray on young trunks and on the branches, unless they are very old and large. The bark of the branches is smoother and lighter-colored than that of the other Black Oaks which are usually associated with the Red Oak, and for this reason the tree can be easily recognized in winter by the color of the branches alone. The leaves are oblong in general outline, with five or six acuminate lobes on each side, separated by rounded shallow sinuses; they are rather thin, smooth, bright shining green on the upper

surface, and shining, although somewhat paler, on the lower surface. They are borne on long slender stalks which, like the upper side of the veins, are sometimes tinged with red; and in the autumn they turn first dull-red and then yellow before falling. The fruit is unlike that of our other Oaks. It is sessile or very short-stalked; the cup is flat or shaped like a shallow saucer, with a narrow raised border of small, close-fitting scales, and is often more than an inch across, enclosing the base only of the large oblong or ellipsoidal acorn, which is as long or longer than the cup is broad. The fruit is produced generally in great profusion, and in October often covers the ground beneath the trees.

The wood of the Red Oak, although strong and heavy, is coarse-grained and difficult to season; it is light reddish brown and contains the bands of large open ducts found in the wood of all the Black Oaks. Formerly it was little used, but of late years, since white oak has become scarce and expensive, it is employed in great quantities in cooperage, in the manufacture of cheap furniture, especially in some parts of the west, and for the interior finish of buildings, for which purpose, when "quarter-sawed," it is well suited and now highly esteemed.

The Red Oak grows rapidly. Very few of the American trees which produce hard wood increase in height and in girth of trunk as rapidly. Mr. Emerson, who devoted much attention to studying the rate of growth of different trees, found that the average increase of the Red Oak in Massachusetts during the first thirty-five years of its life was at the rate of about two inches in diameter every eleven years. In more favored parts of the country it would probably grow more rapidly. As a street or park tree the Red Oak is not surpassed in value by any of our trees, and it is surprising that it is not generally planted. There is, however, a popular belief that Oaks are hard to transplant and that they grow very slowly. White Oaks are certainly difficult to move, and must be set as seedlings if they are to grow into fine trees. But all Oaks grow rapidly when once established, and there is no tree easier to transplant than the Red Oak. Specimens ten or fifteen feet high can be moved with perfect safety from the woods, and if they are planted in good soil will make for many years an average annual upward growth of eighteen or twenty inches. If hardiness, good habit, adaptability to different soils, beauty of foliage, longevity and freedom from disease have any weight with planters of trees, the Red Oak should receive attention at their hands. It is valued in Europe, where, especially in Germany and in Belgium, it is more frequently seen, and in better condition, than any American Oak. But how many Americans plant Oak-trees or realize when they send to nurseries for foreign trees that their own town contains the best material for their ornamental plantations?

Some idea of the beauty of the stem of one form of the Red Oak can be gained from the illustration on page 341. It is made from one of Dr. Rollins' photographs of a tree growing in Dedham, Massachusetts, and one of the noblest specimens in New England.

Squandering a Nation's Patrimony.

At the recent celebration of the 4th of July at Woodstock, Connecticut, Mr. Murat Halstead delivered a striking address, to which he gave the title of the "Preservation of the People's Inheritance." It could be more accurately described as an account of the reckless way in which mankind in general, and Americans in particular, had squandered, and were continuing to squander, their inheritance. In speaking of the decline of certain nations, Mr. Halstead said:

The lands have been wasted, the forests are no more, the soil that once made fruitful hills and blooming valleys is at the bottom of the seas, and the streams that watered the peopled plains are lost in the sands that are the tombs of the profligates who have perished. The elements of possibility, the foundations of prosperity, are gone, never to be restored, and those cancers of the earth, the deserts, are eating away more and more that which should sustain the generations to come.

Coming down to our own country, the speaker referred to the exhausted fertility of tobacco-lands and wheat-fields; to the extermination of food fish and noble game and water-fowl; particularly to our vanishing forests.

The woods have been torn from the mountains, and brooks have departed because the springs have ceased to flow; and, when not dwindled almost to dust-beds, the ancient mill-streams are roaring floods, for the slopes of the ridges are bared and the rain-falls rush from them as over roofs of slate; the hill-sides are plowed up and down preparing gutters to feed the freshets with the soil that is far more precious, in the eyes of those who have been taught the art of seeing, than the precious metals. It is the passion and pride of the average American to smite the trees and shoot the birds and slaughter the last of our running game—and if there are laws for the protection of trees in parks, or game-laws to save the quail and squirrel, or to prevent scouring the rivers with seines out of season, and to provide fish-ladders and abolish fish-traps, they are regarded as tyrannical, a style of oppression identified only with effete monarchies and the tottering despotism of worn-out worlds. The buffalo have been exterminated—a noble race murdered, so that there are hardly enough to supply museums—and if there is a moose left in Maine he has been accidentally spared, and must be pursued by the hunter with remorseless fury to shed his blood to the final massacre. It is a crime to cut down the woods on a mountain, a crime to heedlessly kindle fires to burn forests, but our people have no realizing sense of the sort, and sneer at the Swiss and Germans who require three permits to fell one tree. In New York there is a struggle that seems hopeless to preserve the remnants of the once majestic and always romantic Adirondack wilderness. In our new states the statesmen dare not stand against the timber-thieves.

In some parts of the address Mr. Halstead's rhetoric was rather too intense for scientific accuracy, but, after all, the real sting of the indictment is in its truth. To the speaker's hopeful spirit the establishment of fish-hatcheries by the Government, the effort to protect the seals of Behring Sea, and the reservation of the Sequoia groves were acts which gave promise of a time coming when more serious thought would be given by our nation to the preservation of its heritage. He noted, too, as hopeful indications, that Arbor days were celebrated in many states; that tree-planting by children had become fashionable, and that the discussions over the Adirondack woods, although it might not save the wilderness, would ultimately, perhaps, save many other forests. We feel inclined to consider it another cheering sign that an orator of national repute has felt impelled, on that anniversary when Americans are in their most exultant mood, to raise his voice in earnest protest against the reckless destruction of our forests. No higher public service can be rendered by the country's leading men than the reiteration of warnings like this, until it comes to be universally understood what the ruin of our forests means.

How We Renewed an Old Place.

XIV.—THE ROSE-CHAFER.

There is no interim between our summer visitors. No sooner is the trunk of the last caterpillar packed than the rose-bug arrives, bag and baggage, to take his place. The half-eaten leaves that have been rescued from the jaws of the web-worm are in a few hours riddled with the bites of these winged pests, which are even harder to destroy than their predecessors, for they hunt in couples and fly, and cannot be stamped out of existence.

An imperturbable imp is the rose-chafer, descendant on one side from the scarabœus, and if his Egyptian ancestor was half as hard to kill as this other flying beetle, no wonder the ancients used him as an emblem of immortality.

This voracious summer boarder arrives with unpleasant punctuality upon the 10th of June—that is to say, the advance-guard of the great army shows itself in the shape of a scout or two, who merely precede the main swarm, which comes in a cloud, and settles everywhere, and stays nearly four weeks.

The opening Roses are their nominal prey, and are soon disfigured with their dingy yellow-brown carcasses; but that

is not the worst of them. Grape-blossoms are their dear delight, and nothing but the most unremitting attention will save the future bunches from their greedy depredations. There are at least two to every raceme of fragrant blossoms, and by the time one has disposed of that pair another is flying about all ready to take their places.

Arsenical poisons have no more effect upon them than a cold shoulder on an office-seeker. They may kill the plant, but never the rose-bug, which will crawl undismayed over its ruins, seeking new worlds to conquer. Having no delicate sensibilities, they are undeterred by whale-oil soap, which disheartens most things, and even a dusting with hellebore does not even make them sneeze. The great unterrified eat on in spite of all you can do to them, and no sooner is one set slain than you find another in its place. They remind one of the Jesuit monks in Bolivia, whom the inhabitants finally regarded as supernatural beings, because, no matter how often one cowled and sandalled form was laid low, another succeeded it, till the natives came to believe that the friar was an immortal, whom they vainly sought to destroy.

As to the rose-bug, hand-picking into a bowl of kerosene or hot water, begun at morn, continued till noon, and not intermitted till dewy eve, is the safest resource against the marauders, which devour not only Grape-blossoms and Roses, Spiræas and Syringas, Pæonies and Snowballs, but cover Birches, Oaks, Elms, and even Willows, with their ugly little forms, and leave behind them a lace-work of veins in place of leaves.

Nothing pleases them better than a Smoke-bush in blossom, the future fringe of which they will completely destroy in a few hours. We tried the experiment this year of tying ours up in mosquito-netting, but it seemed to accomplish nothing better than the excitement of the curiosity of passers-by, who could not make out whether it was a ghost on the lawn or a balloon waiting for a Fourth of July inflation. The indomitable chafers perched on the outside by the hundred and chewed at the blossoms through the meshes, so that, what with their attacks and the confinement, the smoke came to nothing after all, for when the cover was removed nothing was to be seen of the fringe but a few bare green stems.

Probably the rose-bugs do not publish a morning paper, or they would learn that the lawn at Overlea is an unhealthy situation for their race, and that their unprecedented mortality in that region ought to be a warning to them. Certainly in the height of the season the hecatomb of victims amounts to a thousand a day, but the cry is, still they come.

We hoped that the long, cold, easterly storm of June would prove a discouragement to them, but the minute it stopped raining they reappeared more numerous and hearty than ever, and made up nobly for lost time. They show a curious preference for old-fashioned Roses, and will devour them, leaving a bed of hybrids of modern varieties almost untouched, and they never are found here on the Tea Roses. They will eat the hardy Hydrangea voraciously, but do not affect the Weigelia. They spoil the Snowballs, but do not meddle with Lilacs. We have some young Canoe Birches that are struggling for existence, and I always imagine the departing caterpillar exchanging compliments with the arriving rose-bug and recommending them to his particular attention, after the fashion of guzzling Jack and gorging Jimmy:

> "Here's little Billee, he's young and tender,
> They're old and tough, so let's eat he."

Positively, if, during three or four weeks of their stay, those insects were not fought tooth and nail, there would not be one leaf left upon those unhappy little trees. As it is, when the brutes depart, the Birches look like a design in skeleton leaves.

This year our hopes were roused by a remedy called Sludgite, which was warranted to kill, not only the rose-bug, but the Colorado beetle and all other insects fatal to vegetation. Though scoffed at by incredulous friends we dared to send for a can of this evil-smelling mixture and applied it to the creature, with whom it undoubtedly disagrees. It is made of the residue of petroleum and soap, and smells to heaven, but, alas! the rose-bug has no nose—at least no nose that takes offense at bad odors. Sludgite is a thick, semi-solid substance that mingles readily with water, and is applied by a spraying-pump or a hand syringe, and kills by contact. The rose-bug and the Colorado beetle keel over with all their heels in the air as soon as the gummy fluid comes in contact with their wing coverings, but, curiously enough, it seems to have no power to destroy the larva of the potato-bug, and, not being a poison, it seems to have no deterring effect upon the little worm that eats the leaves of Rose-bushes, or even upon the Thrip, which whale-oil soap banishes for a long time. Therefore, I judge that the mixture clogs the wings and interferes with the breathing of beetles, or, possibly, whatever virtue it possesses lies in the volatile essence which escapes from it, for the fresh mixture is much more deadly than that which has stood for some time.

But the sad thing about its use is, that the rose-bug is a being that draws no moral from any tale, and he is totally devoid of sentiment. I cannot find that the corpses of his relations take away from his appetite in the least. Possibly the numerous attendants we see at the funeral come for a wake, and they are full as hungry and thirsty as Conn the Shaughraun's cousins on the same melancholy occasion.

Though I am disposed to think that the chafers may not be quite so ready to attack a bush or tree freshly anointed with the unsavory fluid, I am not sure but that the wish is father to the thought. In any case, it is not practicable to shower a bush every five minutes with anything, however deadly, so that it is almost as discouraging as hand-picking.

A distinguished horticultural authority, who takes very little stock in my new discoveries, declares that muscle is worth more than faith, and shows me perfect roses, as large as his fist, to prove it. This is all very well if you are lucky enough to have unlimited muscle at your command, as in an arboretum for instance, where every rose-bug has a man to catch him, but both hand-picking and insecticides are alike failures in a private family with one factotum. What the world demands is a warning of some kind that the chafer who runs may read, a something to convey to his insect-mind or nostrils the information that "no rose-bug need apply," and whoso can make this discovery palpable to the enemy will have his fortune in his red right hand.

The legends connected with the rose-bug are numerous. They tell us that he will not molest a Grape-vine or a Rose-bush close against a house, though he will devour the Virginia-creeper against the lattice of your veranda. He is supposed to object to the dust of the road and to a sprinkling of coal-ashes; but on our own windy hill neither of these deterrents can be made to stick.

Another legend belongs to the potato-beetle, which some of the farmers in this neighborhood vow will not trouble Potatoes planted in a hill with Beans; but this is merely a legend. We have tried it, and find the creatures as lively as ever.

To return to sludgite, I would say that its highest practical use is upon trees and shrubs without blossoms, for the sticky yellow fluid cannot be sprinkled upon roses without spoiling their fairness. So far it does not seem to damage foliage, but we cannot answer for the effect of such a viscid decoction if used many times a day. We have never tried it more than twice in twenty-four hours. It kills or drives away the insects that are there, but others return immediately, so that such insecticides are little better than substitutes for hand-picking.

Our struggles with the hated rose-bug, and the hopeless nature of any prolonged encounter with an inferior organism of overwhelming numbers, find such clear expression in the words of a correspondent that I subjoin an extract from a letter from a lady who has had similar sufferings with another insect:

"I am passing through the discouraging season of gardening, and am realizing more than ever the nature of Adam's curse. It sounds like a fine thing to be told we shall have dominion over the birds of the air and the beasts of the field, but what gain is there in that if we are to be beaten in the end by the angle-worm, the ant and the snail? To fight with a snail, and be beaten, isn't that humiliation? But I stand in the place of the vanquished, and it is the snail that has done it. I was born a sentimentalist, and had scruples about 'taking away the life thou canst not give,' that once hindered my career as a gardener. Now I grieve over the imperfect nature of the snail's nervous system that makes even death apparently painless.

"But he keeps up with the times, does the snail; he reads the seed catalogues, and he knows that Asters cost more than Marigolds; he has an eye for beauty, too; he knows a foliage plant very early in its career, and his taste is always for red rather than green.

"The snail is a much underrated power; his calmness, his persistence, his retiring nature, his thick-skinned endurance, make him a type that is bound to survive, and I predict for him a glorious future. If he can only find enough fools to cultivate gardens for his use he will enter in and possess the land, and develop into something quite grand." All of which quotation, with slight variation, will answer for our winged pest.

I was quite touched by the prediction of a member of the horticultural society of that state, that apparently the whole of

southern New Jersey will have to be abandoned to the rose-bug. This adds a new terror to the already complicated legislation of that unhappy region, for I am convinced, from my experience, that if the rose-bug wants anything he will get it, and no doubt we shall live to see him sitting in the gubernatorial chair.

Hingham, Mass. *M. C. Robbins.*

Notes on North American Trees.—XXVI.

69. *Rhus cotinoides.*—The Tournefortian genus Cotinus, adopted by Linnæus in the early editions of the "Genera," and afterward united by him with Rhus, is re-established by Engler in his monograph of the *Anacardiaceæ*, published in the fourth volume of De Candolle's "Monographiæ Phanerogamarum." The genus, with its two species, one of the Old World and the other of the New, is well characterized by the numerous long accrescent plumose sterile pedicels, and by the unequal development of the fruit which brings its apex at maturity well down on to the side; and in "The Silva of North America" I shall follow Engler, and separate Cotinus from Rhus. There is not much doubt what the names of the two species should be. Linnæus first described the European plant in the first edition of the "Species Plantarum" as *Rhus Cotinus*. *Cotinus* is, therefore, the oldest specific name for the species which, if the genus Cotinus is maintained, must be called *Cotinus Cotinus*. Engler, unfortunately, passed over this Linnæan name, as Koch had done before him, and took up, as the specific name, *Coggygria* of Scopoli ("Fl. Carn.," i., 220) published in 1772, that is many years later than the date of the "Species Plantarum." There is even less room for a difference of opinion as to the correct specific name of the American species. Nuttall, who discovered it, called it as an herbarium name, without description, *Rhus cotinoides;* this name was first published in 1860 in Chapman's "Flora of the Southern United States." The plant was first described by Nuttall himself in the third volume of his "Sylva," which appeared some time between 1842 and 1850, under the name of *Cotinus Americanus*, and *Americanus* is, therefore, the oldest name, whether the plant is called Cotinus or Rhus.

72. *Rhus venenata.*—There is confusion of long standing in the case of the name of our Poison Sumach. It dates from the time of Linnæus, who believed that the Japanese Lacquer, or Varnish-tree, was the same plant as our North American Poison Sumach. He knew from the writing of Kæmpfer that the Japanese used the juices of their tree as a varnish, and so called his species *R. Vernix*. There is no question, however, that when he described *R. Vernix* he was describing the North American and not the Japanese plant. His descriptions in the "Species Plantarum" and the earlier one published in the *Hortus Cliffortianus* show this, as do his references to earlier descriptions and figures of the American plant. De Candolle, finding that the two plants were distinct, made new names for them both and discarded entirely the *R. Vernix* of Linnæus, calling the American plant *R. venenata* and the Japanese plant *R. vernicifera*. Instead of lessening the confusion, this only increased it, as it left a perfectly good Linnæan name without a plant to which to attach it. Professor Gray, as long ago as the publication of the first volume of the "Flora of North America," remarks in the supplement that "*R. Vernix*, L., was originally founded entirely on the North American species; hence the Linnæan name ought to have been continued for our plant." Unfortunately, however, he never corrected the mistake, and in all of his subsequent publications wrote *R. venenata*. I shall, nevertheless, restore the Linnæan name in "The Silva" in spite of the fact that the Candollean *venenata* has become firmly rooted in the literature of American botany. The most unfortunate part of the whole matter is, that our tree has a name which properly belongs to a Japanese tree, as the name *Vernix* was given to our plant on the supposition that the Japanese and American species were identical, and it was chosen, of course, on account of the properties of the juices of the Japanese, and not of the American species. *C. S. Sargent.*

New or Little-known Plants.

New Orchids.

Trichocentrum triquetrum, Rolfe, is a very distinct little species, introduced by Messrs. Charlesworth, Shuttleworth & Co., of Bradford, from Peru. It belongs to the section with equitant vertical leaves, like an Iris, and is allied to *T. iridifolia*, Lindl., though larger, and with very different petals and lip. It is about six inches high, the flowers straw-colored, with the lip variegated with dull orange. The spur is one and a quarter inches long, and the ovary strongly triquetrous, as in *Angræcum Leonis.*—*Gardeners' Chronicle*, June 6th, p. 701.

Oncidium urophyllum, Lindl., an interesting species, which has been lost sight of for many years, has now reappeared at Kew, having been received from the island of Antigua, in the West Indies. The habit is peculiar, as the leaves are sharply triquetrous, as in *O. triquetrum*, while the graceful panicle has numerous yellow flowers with some brown markings. Its whole history seems to be a mass of confusion, for the Brazilian habitat originally given appears to be erroneous, while in the "Flora of the British West Indies" Grisebach confuses both it and *O. Lemonianum* with the very distinct *O. tetrapetalum.*—*Gardeners' Chronicle*, June 6th, p. 701.

Rodriguezia anomala, Rolfe, is a remarkable little species, cultivated in south Brazil by Senor Azambuja, of Porto Alegre, but not yet introduced to Europe. In habit it resembles a Leptotes, under three inches high, but with very numerous racemes of highly fragrant white flowers, slightly tinged with rose and with a yellow crest. This floriferous little plant is very anomalous in structure, for, besides the terete leaves, the spur at the base of the lip is reduced to a sac of such minute dimensions as to be easily overlooked.—*Gardeners' Chronicle*, June 13th, pp. 728, 729, fig. 145.

Lælia-Cattleya × Arnoldiana is a very handsome hybrid, raised by Messrs. F. Sander & Co., of St. Albans, from *Lælia purpurata*, fertilized with the pollen of some variety of *Cattleya labiata*. The sepals and petals are pale purple, and the lip a brilliant dark shade of crimson. It was exhibited as *Lælia Arnoldiana* at a meeting of the Royal Horticultural Society, on June 9th last, and was awarded a silver-gilt flora medal and also a first-class certificate.—*Gardeners' Chronicle*, June 13th, pp. 741, 742.

Disa Veitchii is a handsome hybrid, raised by Messrs. James Veitch & Sons, of Chelsea, from *D. grandiflora*, crossed with the pollen of *D. racemosa*. Though fairly intermediate in character, the flowers most resemble the pollen parent, being of a bright rose-pink. It has flowered in the short period of one year and nine months from the time of sowing the seed. It was exhibited at a meeting of the Royal Horticultural Society, on June 9th last, and, like the preceding, was awarded a silver-gilt flora medal and also a first-class certificate.—*Gardeners' Chronicle*, June 13th, pp. 741, 742.

Sobralia macrantha, var. Kienastiana, is a dwarf and very handsome variety, with pure white flowers and some lemon-yellow on the disk. It was exhibited by Baron Schrœder at a meeting of the Royal Horticultural Society on June 9th last, and was awarded a first-class certificate.—*Gardeners' Chronicle*, June 13th, pp. 741, 742.

Kew. *R. A. Rolfe.*

Foreign Correspondence.

London Letter.

Iris Gatesii.—I noticed this new Iris about this time last year, when it flowered with Herr Max Leichtlin at Baden Baden. Blooms of it were exhibited a few days ago in London, and they fully bore out the high opinion formed of this species by Herr Leichtlin—namely, that its blooms are the largest and most beautiful of all Iris flowers. In habit the plant resembles *I. Susiana*, and it is very similar to that species in the size and form of its large flowers, so much so, indeed, that some authorities declare it to be only a color variety of *I. Susiana*. If anything, *I. Gatesii* is the larger of the two, and, instead of the dusky hue which characterizes *I. Susiana*, the color of the new plant is pale lavender, with a dull purple shade about the base of the falls. The two species ought to be grown together. They apparently thrive under the same treatment and bloom at the same time. *I. Susiana* has been very beautiful at Kew during the past fortnight, a bed of about

Fig. 58.—The Red Oak (*Quercus rubra*).—See page 337.

fifty strong plants having flowered well. The cultivation of this very old, rare and very handsome Iris is but little understood. It should here be planted in the open border, or in a bed of rich soil, in a sunny position, in November, and let alone until its leaves begin to turn yellow, say in July, when the plants should be lifted and dried exactly as though they were Tulips. This is the practice of the Dutch growers, who understand this Iris and all the species of its section better than we do. A well-known Dutch bulb-merchant recommended this treatment to be tried at Kew, and it has been followed with excellent results. *I. Gatesii* is at present somewhat expensive, but it will probably soon become as plentiful as *I. Susiana* is at present in Holland.

A TRIO OF GIANTS are now flowering at Kew for the first time in England; they are *Cereus giganteus*, the Mexican colossal Cactus which we know so well in pictures but have never seen alive until last year, when a specimen, fourteen feet high and weighing over half a ton, was obtained from Messrs. Blanc & Co. It is now in flower in the large Palm-house, where its tall columnar shape is an object of more than ordinary interest to visitors, some of whom have named it the Vegetable Cleopatra's Needle, from its resemblance to the column on the Thames embankment. The second of the trio is *Primula imperialis*, which is by far the largest of all Primulas. By the way, Sir Joseph Hooker has altered his opinion with regard to this plant and the Himalayan *P. prolifera*, which he once thought to be identical, but which, after seeing the two together in cultivation, he now admits to be both very well-marked species. I am certain that *P. imperialis* will fill a large place among popular cool-house, and possibly even hardy, plants before very long. *Iris Robinsoniana* is the third in the trio. Up to the present this plant at Kew has produced no less than 167 flowers since it first began to bloom on June 21st. I shall refer to it again next week; meanwhile I can say that it is the most interesting plant flowered at Kew since the time of the big Amorphophallus. It ought to become very popular in California, where, no doubt, it would be as happy as *Agave Americana*.

Weigelia hortensis, var. *nivea*, is a first-rate shrub with large pure white flowers, which are produced in clusters all along every branch. It was recently shown by Messrs. Veitch & Sons from their nurseries at Coombe Wood, where it forms handsome compact bushes, perfectly hardy, of course, and wreathed in flowers in June. *Indigofera Gerardiana*, var. *alba*, was also shown by Messrs. Veitch & Sons, and it is a good plant, too. The flowers are in erect axillary racemes, each about as large as the type, but pure white. Experience with it out-of-doors up to the present points to the necessity of some protection for it in winter, either by planting it against a wall or covering it during severe weather. Equally interesting with the above were two named varieties of *Azalea Indica* which Messrs. Veitch introduced a few years ago from Japan, and which have proved as hardy as the hardiest of Japanese shrubs. They differ in habit and foliage from the ordinary forms of the type, being dwarf and spreading, while the leaves are broader and thinner than in the greenhouse varieties of this species. In a few gardens near London *A. amœna*, which is also a small-leaved form of *A. Indica*, is grown in shrubberies and beds out-of-doors, and it thrives well without protection. But these new varieties, which are named Damio and The Mikado, respectively, have flowers as large as many of the greenhouse Azaleas, their color being rosy salmon. Both kinds had stood the past severe winter unprotected, and they were shown thickly laden with bloom.

DWARF CANNAS.—I believe these beautiful creations of the French nurserymen are the most talked-about greenhouse-plants in London at the present time. At the exhibitions and in public gardens they win universal admiration on account of their dwarfness, the elegance and sometimes purple hue of their foliage, but mostly because of the size, substance and beautiful colors of their flowers. Grown in a sunny greenhouse, and well fed at the roots, they form sturdy plants less than two feet in height, and each bearing several large spikes of handsome bloom. Everybody seems to be inquiring where these plants are to be obtained.

A HYBRID LILIUM.—Mr. C. G. Van Tabergen, of Haarlem, has succeeded in crossing *L. Martagon album* with *L. Hansoni*, and he has recently sent flowers of the hybrid to Mr. Baker, of Kew. He writes: "The cross was effected by me in 1886, and, singularly enough, all the seedlings have proved common red *L. Martagon*, except some five or six, in which the characters of both parents are clearly blended. The foliage is that of *L. Martagon*, but broader, and there are fewer leaves in a whorl." As a decorative plant this hybrid has little to recommend it, but it is most interesting, because of its being one of the very few known instances of Lilium hybridization. It is remarkable that, notwithstanding the efforts of many cultivators to obtain a good hybrid Lilium, not a single well-authenticated instance of success is known. Of course, we have several supposed hybrid Liliums, *i.e.*, *L. Parkmani*, of American origin, and said to be from *L. auratum* × *L. speciosum*, but now generally considered to be merely a variety of *L. auratum*. Mr. T. S. Ware, of Tottenham, also claims to have crossed *L. pardalinum* and *L. parvum*, but the result was a plant very like the first-named species. Good hybrid Liliums, such as, for instance, *L. auratum* with *L. longiflorum*, or *L. croceum* or *L. umbellatum* with *L. superbum*, ought to be possible, but apparently they are not. Can the physiologists tell us why?

Verbascum Olympicum is a giant Mullein which few people attempt to cultivate, possibly from a belief that it is not easily accommodated, or that it is rarely satisfactory in the garden. I believe it is a very good-natured plant if only its real needs are considered and supplied. Planted in well-drained, deep soil, and let alone, except in very dry weather, when it should be watered, it soon develops into a huge rosette of leaves, from which, in its second year, it pushes up a stout, tall, leafy scape, which branches freely, and finally develops hundreds of beautiful yellow flowers. Mr. Cannell showed three spikes of it last week which were fully eight feet high and simply sheaves of golden flowers. In a bed adjoining a greenhouse at Kew a fine example of it has been most attractive for weeks, and is still very handsome. So stately a plant deserves to be universally grown. I know one garden near Cambridge in which these giant Mulleins are a magnificent sight every summer.

Kew. *W. Watson.*

Cultural Department.

Stray Notes from the Arnold Arboretum.—V.

IT is not necessary to say that Lilacs are beautiful and valuable shrubs. Some of the species are as well known and as generally cultivated, in all temperate parts of the world, as any other shrub except the Rose, and it would be difficult to find a garden, here or in Europe, especially a garden of the old-fashioned sort, in which a Rose was growing, where there was not a clump also of the so-called common Lilac (*Syringa vulgaris*). This plant deserves its popularity; there is not a better garden-plant. Tough, reliable and long-lived, the Lilac goes on growing and spreading, year after year, and through generation after generation of human lives; every year it flowers, and every year the flowers are abundant, beautiful and fragrant. A Lilac-bush appeals to every one who sees it in flower, and the feeling for it grows continually stronger, as it does in the case of all plants with which we have been associated from childhood. There are certain plants which always appeal to the human heart and move its deepest sympathies—the Rose, the Violet, the Lily, the Lilac and a few others—different plants in different countries. Other plants produce more beautiful flowers, others are rarer and more wonderfully constructed, and a hundred times more expensive, perhaps, but none of these, not even the rarest and the most expensive Orchid, produces that peculiar sentiment which the true lover of nature feels for the humble Violet or the commonest Wild Rose.

The Lilac has been cultivated during so many years, and has been such a favorite, it is not strange that gardeners have paid much attention to producing improved varieties by selection, and, in some cases, by hybridization. There are now hundreds of these varieties in cultivation, and among those produced in comparatively recent years there are a few of extraordinary beauty and value. There is a collection of about a hundred of these varieties in the Arboretum, taken from the best French and German nurseries, and believed to contain all the best and most distinct forms. It is not my purpose to speak of the value of these varieties now, as they have not been sufficiently tested here yet to make it desirable to do so. It is proposed, next year, to gather them into one bed, three or four hundred feet long by twenty feet wide, at the foot of one of the road-slopes, where, once established, they should make a remarkable display, and, in time, show their individual peculiarities to the best advantage.

It may be mentioned that, among varieties that have been thoroughly tested here, none are better than Marie Lagrange, a variety with very large, pure white flowers in long clusters, the well-known Charles X. and Philamon. This last has dark red-purple flowers of immense size. The man who possesses well-established clumps of these three Lilacs in his garden

will have, when they are in bloom, three of about as handsome objects to look at as can well be found.

There is one serious drawback to all the varieties of the common Lilac. The leaves mildew badly during our summers, and the hotter the region is where they are grown the greater the disfigurement from this cause. In cold regions, as in some parts of Canada, the leaves are not disfigured from this cause, and retain their beauty until late in the autumn, although they never assume any brilliant autumnal coloring. There is a Chinese Lilac, however, which is not troubled by mildew. This is the plant found in gardens under the name of *S. oblata* (see GARDEN AND FOREST, vol. i., p. 221), although it resembles the common Lilac so closely that some botanists believe that it is only a form or variety of that species. As a garden-plant it has the merit of flowering ten or twelve days earlier than the common Lilac; the flowers are rosy purple and exceedingly fragrant, although the clusters are much smaller than those of any of the improved varieties of *S. vulgaris*. The leaves are large, broad, thick and leathery, and are never touched by mildew; in the autumn they turn deep vinous red, and at that season of the year are extraordinarily beautiful. Indeed, *S. oblata* is well worth a place in the garden for the beauty of its autumn leaves, quite apart from its value as an early spring-flowering shrub. It is a plant to which gardeners will do well to devote more attention than it has yet received, with the idea of producing improved seedling varieties. It may be expected, too, to aid, by hybridization, in the development of a new race of good Lilacs, with large and leathery foliage, able to resist mildew, and with the flowers of some of the best forms of the common Lilac. *S. oblata* has been an inhabitant of European and American gardens for many years, but, for some reason or other, its beauty and value have never been properly appreciated.

It is not necessary to speak here of the Chinese Lilac, *S. Chinensis*, so called, a variety, no doubt, of the common Lilac, a familiar inhabitant of the gardens of northern China, and now well known in those of America and of Europe, or of the Persian Lilac, with its narrow foliage and abundant flowers. These plants are both well known to every one who cultivates hardy shrubs. There are, however, five other Lilacs in the Arboretum which are still very slightly known to gardeners, although among them are some of the best garden-plants introduced in recent years. They can be most conveniently mentioned in the order of their flowering.

Next week I shall speak of some of the Lilacs which have been more recently brought into cultivation.

Arnold Arboretum. *P. C.*

[It is interesting to reproduce, in connection with our correspondent's remarks on Lilacs, the following extract from an article on the genus Syringa, from the pen of the distinguished botanist, Franchet, published in the 1st of July issue of the *Revue Horticole*. In speaking of the common Lilac, he tells us:

It was introduced into western Europe about the middle of the fifteenth century. Belon saw it about 1548 cultivated in the gardens of Constantinople. The first exact information, however, that exists about this plant dates only from 1565, when Mattiolus, in his "Commentaries of Dioscorides," gives in the edition of 1565, on page 1236, an excellent figure of the common Lilac under the name of "Lilac," adding that the figure was not made from the living plant, which he had not seen at that time, but from a painting brought back from Constantinople by Busbecq, Ambassador of the Emperor Ferdinand I. at the court of Soliman, who lived at Constantinople first in 1555 and again from 1556 to 1563. Busbecq is generally supposed to have introduced the Lilac into Europe, probably first into Italy, and then perhaps into Bohemia. In any case, Mattiolus, who says that he had not seen the living plant in 1565, relates in a later edition of his work that he had received before 1570 flowering and fruiting branches sent to him by Cortuso from the Botanic Garden at Padua. According to Cortuso, the plant was common in Africa in his day, and was known under the name of Syringa, a statement that needs confirmation.

In any case, the cultivation of the Lilac soon became popular in western and central Europe. Clusius, in his "Rariorum Plantarum Historia," published in 1601, says that at that time it was to be found in all the gardens of Belgium and Germany. It appears also under the name of Lilac, as cultivated in the neighborhood of Paris, in the catalogue of Robin, published at the same date; in the catalogue of R. Morin (1621) it is called *Siringa cærulea Lusitanica*. The history of the introduction of the Lilac is certainly well established, and it is surprising that A. P. de Candolle, usually so exact, should have affirmed in the "Prodromus" that the Lilac had been brought from Persia in the second half of the sixteenth century, although Boissier does not even mention the plant as usually cultivated in Persia.

The native country of the Lilac—that is to say, the region where the shrub grows spontaneously—is still undetermined. Most of the old authors, including Linnæus, ascribe it to Persia, which is certainly not correct. It was in 1828 that it was first stated that the Lilac belonged to the European flora, Heuffel and Rochel declaring at that time that it grew spontaneously in the Danubian provinces. Thirty years afterward, in 1858, Heuffel, in his "Enumeratio Plantarum Banatus Temesiensis," summed up in the following sentence everything he had said before on the subject: "Very common and truly indigenous in all the region of the Danube from its passage across the Banat to the Thermes of Hercules." Without absolutely denying that the Lilac is spontaneous on the banks of the Danube, it is well to remark, first, that the discovery of the shrub, so easily recognized from its abundance in situations where its presence would strike the eyes, did not occur until very late. Second, that it possesses in a remarkable degree the power of naturalizing itself and of spreading where it has once obtained a foothold. Third, that in the beginning of the sixteenth century it was, according to the testimony of Clusius, already widely distributed in Germany; while, on the other hand, the Emperor Ferdinand I., whose ambassador at Constantinople Busbecq was, was also King of Hungary. Fourth, that in the gardens of Pekin are two Lilacs so closely related to the common Lilac that it is not possible to distinguish them specifically, one of them being the so-called Chinese Lilac, or *Lilas Varin* of gardens. Fifth, that all the other species are incontestably Asiatic—that is to say, of Indian or Chinese origin. It must not be supposed that these doubts with regard to the spontaneousness of the Lilac in the Danubian regions are advanced in a spirit of scepticism; there is here an interesting question of botanical geography, and it is from this point of view only that these doubts have been raised.

To this Monsieur Edward André, who had just returned from a long journey in eastern Europe, adds the following editorial note:

We can add a few words to the facts which have aided our learned contributor in reaching these conclusions, having just seen the Lilac growing in abundance in a perfectly wild state on the mountains which separate Servia from Bulgaria. We found it most common on the precipices which rise from the narrow defile of the Nischava, near Nisch, where it was mingled with *Staphylea pinnata*, *Coronilla Emerus*, and other spring-blooming shrubs, and enlivened with the masses of the beautiful flowers of *Lunaria annua* and of *Adonis vernalis*. Any botanist who had passed in this picturesque region, remote from any habitation, would have believed as we did, that the Lilac was growing there spontaneously.

The issue of GARDEN AND FOREST (No. 165) containing Dr. Christ's letter with regard to the native country of *Syringa Josikæa* probably did not reach Monsieur Franchet until after he had written his communication. His argument, however, with regard to the naturalization of the common Lilac in Europe in recent years would apply with equal force to *S. Josikæa*, which is hardly to be distinguished specifically from the widely distributed and variable *S. villosa* of southern and eastern Asia. It is certainly remarkable that these two plants with showy flowers, and conspicuous throughout the year from the fact that they spread into large masses, should have escaped the attention of botanists and gardeners in the Danubian provinces until 1828 and 1830. Instances of plants, even trees and shrubs, establishing themselves in a comparatively short time in extra-tropical regions remote from their native countries are numerous. In this country a person unacquainted with the character or composition of our flora and its history would easily believe that the European Barberry and the Woadwax (*Genista tinctoria*) were natives of New England; and that the Cherokee Rose (a native of China), the Ailanthus and the *Melia Azedarach*, or Pride of China, were indigenous in many parts of the southern states. Not less remarkable is the spread and entire establishment in the southern Atlantic states of the Chickasa Plum, a native probably of the high plateau at the eastern base of the Rocky Mountains and brought east of

the Mississippi River, no doubt, by the Indians, through whose agency, also, the Catalpa has been made to appear indigenous in regions remote from its true home.—Ed.]

Hardy Flower Garden.

OWING to the genial growing weather and cool days, hardy plants of all kinds are rapidly occupying the space allotted to them. It is a good plan to make notes of any desired changes, and it is none too early to begin, for many of the earlier-flowering plants and bulbs have already died down, and, where this is so, the places must be carefully borne in mind or marked, so that when replanting is done in fall such plants may not be disturbed. Unless hardy plants are placed in position with the greatest care by one acquainted with the nature of each plant, it takes a season or two to get them so arranged that, by the contrast or the blending of colors, each one may produce the best effect, and none may thrive at the expense of its neighbors.

Polemonium pauciflorum is now in bloom with us, and, for a Polemonium, is very distinct, owing to its tubular yellow flowers, but as a garden-plant it will probably go the way of all the other species; there are none that are really worth caring for, now that we have so many better garden-plants.

Mr. Barker's note on *Heuchera sanguinea* fully corroborates my statement that there are inferior varieties in cultivation. He describes the flowers of his plants as "salmon-red," which is, no doubt, correct. Our plants have flowers of the most brilliant crimson, and this should be the proper color of the flowers as first described. An English writer describes this plant as the best hardy plant sent out for years; certain it is that seedlings vary a great deal in flower and leaf. Once in a while an extra large and bright flower is obtained, but much oftener the reverse. A remarkably good variety is said to have been produced in Ireland.

Aquilegia chrysantha alba seems, beyond question, to be the plant already known here as *A. cærulea alba*. It is identical with the blue Rocky Mountain Columbine in all but color, and it flowers at the same time. It is useless to depend upon seeds bought in Germany to produce a good-named collection of Columbines; the plants come fast enough, but it will save a lot of trouble and disappointment if they are left without labels. Columbines, of all other plants, need careful isolation to produce seeds that will come true.

We have six varieties of Lemoine's hybrid Montbretias, also *M. crocosmiæflora;* they were kept growing all winter in a cool house, and are now all flowering. The merits of the various kinds have been already commented on in Garden and Forest, and it is only necessary for me to add that all of the varieties we have are quite distinct, and some are much more showy than the parent plants. A large group of the Montbretias, Kniphofias and *Arundo donax versicolor* are planted together, and promise to make a fine display later on. The Kniphofias, or Torch Lilies, are already showing flower-spikes.

Young plants of *Phygelius Capensis*, raised from cuttings last winter, are flowering freely and make excellent border-plants, and, even should they not prove hardy, may easily be wintered in a cold frame. Of annuals, the Marguerite Carnation will be an indispensable plant for summer-flowering. Ours are just commencing to flower, and it would appear as if the strain has been improved upon since last season, as there is a much smaller percentage of single flowers, and all are flowering, while last year there were many plants which would not keep the promise to flower in a few weeks after sowing. When wintered over, however, they flowered this spring. We owe a great deal to the raiser of this pretty and precocious race of Carnations.

So. Lancaster, Mass. *O. O.*

A New Water-lily.

WITH the present extensive cultivation of Water-lilies and the widespread interest in them, it is to be expected that the present list of varieties will be continually extended by hybrids. We can hardly hope, however, for the frequent occurrence of one so beautiful as that which has appeared with H. F. Bahnsen, M.D., of Salem, North Carolina, an amateur cultivator of aquatics. The plant is apparently a cross between *Nymphæa odorata rosea* and *N. alba candidissima*. It is unnecessary, perhaps, to say that such a cross is likely to produce a valuable hybrid, the first-named parent having a beautiful flower, with all too short a season of bloom, while *N. alba candidissima* is a strong grower, always in flower. The new plant has strong rhizomes, resembling the latter variety, while the leaves (when well grown, about a foot in diameter) are intermediate between the two varieties, the Cape Cod Lily having cordate leaves, with a somewhat wide opening at the base, while in the other the opening is closed by the overlapping of the bases. The cleft in the leaves of the new hybrid is simply closed with a trifling lap. They have even stronger veinings than the parents, and in color resemble those of *N. odorata rosea*—green above and red beneath. But it is from the superb flowers that the variety is worthy of the name Superba. These are very fragrant, very freely produced, and in good specimens measure seven inches in diameter. The petals are somewhat narrow and very abundant, a flower now open being formed of forty-two petals, disposed in three rows.

The color is of the clearest rosy pink, which appears rather as a glow on the petals, the faintest tint at the points deepening into the heart of the flower. As one looks into the flower under the changing light the color seems to be a tint from the sun or clouds, rather than emanating from it; then, as the golden stamens are reflected, it takes on a most charming salmon tint, adding a final touch to its charms. Dr. Bahnsen needs no stimulus to his ardor in the cultivation of Nymphæas, but in this plant he is fortunate in adding a variety which must be considered among the very best of the race.

My studies of what we may call *N. odorata superba* have been made from flowers sent by Dr. Bahnsen, and a strong plant with which he also favored me. This latter, received in sphagnum, when first planted out in my tank, gave me an experience strongly confirming Mr. Meehan's theory as to the lack of coloring of flowers on plants not established (Garden and Forest, p. 333). The plant was well furnished with leaves and buds, one of the latter having apparently expanded once. This opened the next day, beautiful in color, like the previous samples sent me. The next day the color had entirely disappeared. The next bud also, which was in a forward state, also expanded, of full size and a noble flower, but with no trace of color. The reason must have been, of course, the lack of nutrition from the newly planted roots, which had no chance to become established. There is one point about colored Nymphæas on which interesting experiments might be made, namely, the influence of manures and soil on the coloring. It seems to me that, at least in the case of *N. odorata rosea*, the soil and the form of manure has an influence on the color. My flowers this year are not so dark on this variety as on the same roots the previous season, and they are growing in lighter soil and, perhaps, less manure, although otherwise under the same conditions. There are also other points to be determined, and the cultivator of aquatic plants has many interesting problems before him, as well as the beautiful picture of the water-garden.

Elizabeth, N. J. *J. N. Gerard.*

Basket-plants.

SOME well-grown basket-plants make a pleasing addition to a conservatory, and many beautiful species display their charms to better advantage under this method of culture than when grown in pots. Among this class specially adapted is *Torrenia Asiatica*, an old species, but a very pretty one, which has opposite, serrated leaves of bright green, the flowers being tubular and four-lobed, porcelain-blue in shade, and the tips of the lobes white. In habit it is much-branched and trailing, and the flowers are produced from the axils of the leaves in great profusion. *T. Asiatica* is propagated from seeds or by cuttings, the latter rooting very readily, and its cultivation is of the easiest.

Another showy basket-plant is *Begonia glaucophylla scandens*, a variety that does not seem very common, though it has been cultivated for many years. As indicated by its name, this plant is of scandent habit, which is somewhat unusual among the Begonias, and has dark green leaves of similar shape to those of *B. Saundersii*, but much larger; and the flowers, which are produced in short-stemmed clusters, are bright red, though becoming much lighter when fully open. This plant grows freely, and under favorable circumstances its shoots will hang two to three feet below the basket, and completely hide it from sight. *Cyrtodeira Chontalensis* (now reclassed under Episcia), to which reference has already been made in these columns, is another excellent warm house basket-plant, with ovate leaves, light green above and purplish beneath, and tubular flowers, lilac in color, with a yellow centre. This Cyrtodeira prefers some shade and a moist atmosphere, besides light rich soil and an abundance of water at the root. It is easily multiplied by means of cuttings, and fresh young stock should be selected each season.

Still another pretty plant for baskets is *Othonna crassifolia*, which has the additional advantage of being an excellent window-plant. It produces long trailing shoots that are thickly fur-

nished with short fleshy leaves of bright green color, and during the summer is profusely dotted over with star-like bright yellow flowers about half an inch in diameter. It is of the easiest culture, and enjoys full sunlight and plenty of water, and, when so encouraged, will soon entirely cover a basket with a mat of bright verdure.

The variegated form of the Ground Ivy, *Nepeta glechoma*, also makes a very pretty specimen when well grown in a basket, its kidney-shaped leaves being handsomely marked with white, and the long slender shoots are very graceful. Its flowers are not very showy, being quite small and blue in color. It roots very readily, and can be grown well in either a cool greenhouse or in a window, and it makes an admirable carpeting for a window-box.

Among summer-flowering plants that may be used in baskets with good effect the Achimenes are prominent. These plants comprise a very showy group of the *Gesneriaceæ*, and require a light open compost well enriched with old manure, as their growth is rapid under congenial conditions. By using large, deep baskets, shaped like an ox-muzzle, the Achimenes may be planted all around the sides as well as in the top of the basket, and, with the aid of a few stakes to keep the plants from falling about too much, the basket will be completely hidden by the mass of brilliant flowers and attractive foliage. The Achimenes are deciduous and must be watered occasionally during the season of rest, in order to keep the tubercles in good condition. At this period they may be stood under the bench in a warm house. The Achimenes now make a long list, and much variety in color is to be found among them, but the following are all good sorts: Ambroise Verschaffelt, pale lilac, with reddish spots in centre; Aurora, dark scarlet, yellow eye; Longiflora alba, white, with blue lines in centre; Major, large, bright blue.

Holmesburg, Pa. *W. H. Taplin.*

The Newer Varieties of Strawberries.

THE early part of the season just closed has been a very trying one for Strawberries, as we had but one inch of rain-fall from May 1st to June 15th, at which time the vines of many varieties had the appearance of being scorched by fire. On the 16th of June there was a rain-fall of nearly three inches, thoroughly saturating the ground, reviving a large number of varieties to such an astonishing degree that one of the best-paying crops ever grown in this section has just been harvested. Of the newer varieties tested for only one season, I should place first on the list of early ones Van Deman, a variety originated by J. C. Bauer, Judsonia, Arkansas, and not yet in market. This has proved the earliest variety from which a quart of fruit could be picked. The growth of plants is vigorous and stocky; foliage dark green; fruit-stems short, hiding the fruits, which are of a very glossy scarlet color, with yellow seed, firm, and of a brisk tart flavor. This berry, while not of mammoth size, will sell well both on account of its earliness and brilliant color. Michell's Early has failed to justify the claims made for it; it was neither extremely early nor very productive. The fruits are of but medium size, soft, and of a very poor color; too light for a market berry. The flavor, however, is very choice. I am of the opinion that if this variety could be grown on light sandy soil it might prove more productive, as it naturally would not exhaust itself in making the number of runners it does on well-enriched clay loam. Tippecanoe is an improvement on Sharpless, as fruited here this year, earlier and more productive. Phillips' Seedling and Greenville are of the same type, each as vigorous as Sharpless; fruits of same shape, but without the characteristic green tip of the latter, and larger fruits on individual plants. Improved Manchester, a cross of Manchester and Miner's Prolific, seems a promising sort, and quite productive; fruits similar in shape to Jersey Queen, of darker color, but with the distinct peculiar flavor of the latter.

Shuster's Gem has not done very well here. The growth of vines has been poor, and the yield moderate. California and No. 19, two varieties from Delaware, are of low stocky growth, but not productive, the former bearing long dark scarlet fruits of but medium quality; the latter with fruits a fac-simile, in every respect, of Jersey Queen. Oliver is an Illinois production of wonderful growth, each plant making a perfect ball of dark green leaves; fairly productive. Gipsey, from New Jersey, did not do as well as expected from reports. It is a very showy berry, firm enough to ship, and of excellent flavor. Mrs. Cleveland makes a very fine growth, and set a large quantity of fruits, but the fruits ripened imperfectly, having the end imperfect or hard. Edgar Queen gave promise of being a fine berry, but, with Cloud, suffered severely by reason of drought. Beeder Wood proved wonderfully productive. It is a stocky grower, but the fruit-stalks are weak, and, if grown in stool, plants would need to be mulched; fruit rather soft, but could be shipped to near-by markets. Its season is long, as we picked fruits of it for twenty-two days. Parker Earle has sustained the claims made for it, being in every respect, but firmness, perfect. One who has not seen a row of this variety when in full bearing, can have little conception of its appearance, with almost every berry of uniform size and shape. The brilliant scarlet color, the large yellow seeds and the immense clusters, combined with the final test of flavor, make it one of the most desirable of the newer varieties. Its season here has been about with Gandy, which, however, gave a good picking a few days after Parker Earle had finished fruiting. Eureka has proved itself to be a fine variety, the quality of the fruits superb, quite productive and firm. Stayman's No. 1, while above the average in productiveness, did not sustain its record of last year. It set a large crop of fruit, but was not able to withstand the drought.

The Jessie has given better satisfaction this year than in former seasons. The fruits have been of a uniform size, and, while not extra large, held good size through picking, and gave a very fair yield. The quality I have always considered fine, and where it can be grown under suitable conditions must take rank, in my opinion, with the best. Lady Rusk gave a larger yield than last year, but the fruits run small and ill-shaped. Bubach has never succeeded in bearing a good crop here, although highly spoken of in most localities. Haverland, a fine variety to look at when in full fruiting, is too soft for general use. Middlefield, while not up to its former record, is still, in my mind, one of the best new pistillate varieties, ripening its first fruits about midseason and continuing late in bearing. One variety, not as new as the above, should not be omitted in any collection, that is the Burt's Seedling, claimed to be the old Captain Jack revived. In general appearance and yield of fruit there is no difference between them. It proves a fine cropper in most localities. The fruits resemble those of Wilson, firm and subacid. Being a perfect flowering variety, is a first-class fertilizer for the early pistillates. During a recent visit to several of the Strawberry-plantations of Oswego County, I found Cloud, Eureka, Burt's Bubach and Warfield were the leading varieties grown. The soil being stony light loam, they had not suffered as much through the dry season as other sections of the state, and I was able to see the Cloud in what seemed its natural soil, and it was very fine. I was told that pickers were anxious to be assigned to that variety and Eureka, as the large yield and size made a difference of a number of quarts in a day's picking.

Agricultural Experiment Station, Geneva, N. Y. *C. E. Hunn.*

Correspondence.

The Northern Forest.

To the Editor of Garden and Forest:

Sir,—It is interesting to hear the surprised comments of friends from lower New England, and even from the Champlain valley, who walk with me through the woodlands of the Memphremagog region, or notice the transplanted trees upon my lawns. No Oaks, no Hickories, no Chestnuts, nor Black Walnuts, nor Horse Chestnuts,—no nut, in short, but beechnuts, hazelnuts and butternuts. Also no Locusts, no Lombardy Poplars, no Catalpas and no Wistarias; nor climbing roses, except at the cost of careful protection. Our hardy climbers are limited to the native and some foreign kinds of Clematis, Lonicera and Ampelopsis. But of hardy shrubs, native and foreign, there is a great variety, including many Viburnums, Lilacs, Barberries, Bush Honeysuckles, Elders, Alders, Shepherdias, Wicopy, Japanese Rose, Amelanchier, Philadelphus, Hamamelis, Eleaginus; to say nothing of Ribes and many other things of recent importation, along with the Russian fruits, though not yet much distributed.

But it is of the forest-trees particularly that I wish to take note. First among deciduous species stands the Sugar Maple, with its congeners. The Maples are among our largest as well as most numerous trees. They grow to a great size, and are never seriously winter-killed, yet one cannot examine them without being assured that they are nearing their northern limits on our mountains. Really sound specimens of large size are somewhat rare. Going north from our highlands (nearly all of north-eastern Vermont is from 1,000 to 3,000 feet above the sea-level), following the slope to the St. Lawrence River, Maples rather improve than otherwise—the lessening altitude more than compensating for change of

latitude. The White Maple is more tender than the Sugar Maple, outside the forest or as a lawn tree—the bark being frequently killed in exposed situations. Red Maples are more hardy, and the striped and mountain Maples seem quite iron-clad. Negundo has also been lately introduced with success.

The Beech thrives as well as the Maple, but is often unsound, and does not reach so large a size as it does farther south. It fruits freely, however, although all of the great county of Aroostook, in Maine, lies considerably to the north of Vermont, yet the effect of a lower altitude is shown in the greater perfection to which the Beech grows there, even up to the latitude of Quebec. The Yellow and Canoe Birches are our only species of this family, and they both thrive perfectly, being among our largest and tallest trees. The first is almost as abundant as the Maple in the untouched forests, but is removed preferably for fire-wood, and lately for lumber—the Sugar Maples being rarely taken for this purpose, except when too much scattered to be available for sugar.

Among other Maples is a tree, not uncommon on my farm, differing distinctly in some particulars from the other Maples, though I am not botanist enough to accurately describe the distinctions. But the most notable practical fact about the tree is the great amount of tannic or gallic acid in its sap. Sugar-makers avoid it on this account, for it strongly reacts upon the iron spouts, so as to give the sap an inky color and taste, ruinous to the sugar. Neither the White, Red nor Sugar Maple saps do this.

Among our evergreen forest-trees, now that the Pines have nearly disappeared, Spruces stand first in number and commercial value. The Black Spruce is everywhere abundant, but the Canada line seems almost the southern limit of the more beautiful White Spruce, the finest of our evergreens for ornamental planting. Both are perfectly hardy, and make fine lumber, though the larger trees are becoming scarce, except in inaccessible localities. The Hemlock Spruce, though it is abundant, and grows to a large size, I have found distinctly tender when planted in exposed situations, and it is perhaps due to this lack of absolute hardiness that the "shaky" character of a large proportion of our hemlock lumber is to be attributed. At neither of two large mills was I able, recently, to obtain hemlock planks sufficiently sound to make a watering-trough, though they had plenty of hemlock timber, such as it was.

It is often asked whether our forests are disappearing. In northern New England they certainly are not. The farmer has a constant struggle against the persistent spread of seedling trees over his cleared land; and if man should abandon this region I think in a hundred years it would hardly be possible for a visitor to realize that it had ever been inhabited by civilized man. It is this constant pressure of the forest upon intruding settlements that prevents the average farmer from taking an interest in forestry. He has to fight for his life against the forest, and the idea that the forests are likely to be extirpated seems to him quite absurd. One of the largest and finest sugar-orchards in this town was seventy years ago a wheat-field.

Newport, Vt. *T. H. Hoskins.*

[What our correspondent says of the pressure of the forest upon the cleared land in the eastern states is all true. It is also true that there are vast areas in the country which will never reforest themselves, when once stripped of timber, and that there are many places, even in the east, where the thin coating of earth left on the rocks after the forest-floor has been destroyed by fire, will not support a vigorous forest-growth. Of the deterioration of the quality of the forest, which is quite as important as loss in quantity, we have often had occasion to speak.—Ed.]

Recent Publications.

Landscape-gardening. By Samuel Parsons, Jr., Superintendent of Parks, New York City. Illustrated. G. P. Putnam's Sons, New York and London, 1891.

It is many years since Downing wrote of landscape-gardening for American readers, and, though helpful books by Scott and others have since been published, there was room for another. During the past thirty years the desire of American dwellers in cities to possess and beautify country homes has greatly developed, and such homes have been established along sea-coasts of very diverse character, as well as on mountain-sides and fertile valleys. The spread of wealth and culture through the western states and along the Pacific coast has likewise multiplied the problems with which the landscape-gardener has to deal in the disposition both of private grounds and of public parks; and the materials now offered for his use are infinitely richer and more varied than those of a generation ago. It would indeed be a complicated and difficult task to write a book on landscape-gardening which would cover the whole field to-day and be of use in all parts of our country. This task Mr. Parsons has not attempted. In his introduction he explains that his book is not a systematic treatise, but a series of "simple desultory talks," written with the desire to arouse increased enthusiasm for his art among men of moderate means.

Judging it from this point of view, it contains much that is of interest and value, and though it must be charged with some sins, these are chiefly sins of omission, partly chargeable to the fact that unless one writes very systematically on such a subject as this, points of vital importance are sure to be forgotten.

Unfortunately, the terminology of this art is not firmly fixed and generally understood. One who writes about landscape-gardening is compelled to begin by defining the terms he uses, and, with all possible care, he cannot always find terms of exact appropriateness. For example, Mr. William Robinson, writing recently in *The Garden*, used the word "garden" to indicate the grounds forming the immediate ornamental environment of the house, though this word is commonly employed to designate a place in which flowers are grown. He explained, however, that the lawn must be "the heart of an English garden." To indicate these same grounds Mr. Parsons uses the word "lawn," although the very first sentence of his first chapter explains that "to the minds of most readers the lawn suggests simply grass." He might better have employed the term "home grounds," a term that once was generally used, but now appears to have gone somewhat out of fashion. This term is never applied in a narrower sense than the one Mr. Robinson intends by "garden," and Mr. Parsons by "lawn," and a very brief and simple explanation would prevent its being taken in too wide a sense.

Mr. Parsons' first chapter is devoted to the proper way of laying out and making a lawn, in the narrower acceptation of the word, and is chiefly of practical value, although it contains some good suggestions of an artistic kind, notably one with regard to the placing of the house, so that the lawn shall come opposite the main living-rooms and not the entrance front. Then he treats, in an excellent way, of "Sloping Grounds," and of the effects which may be produced in the home grounds during the different seasons, giving lists of plants which are especially beautiful in spring, summer, autumn and winter. We are gratified to see the fact emphasized that all times of the year should be provided for in our home grounds, as it is common to find places at their best for a brief time only, or, if no season has been specially thought of, the effect is at no period of the year so beautiful as it ought to be. The possibility of creating a charming winter landscape is more commonly ignored than any other, and Mr. Parsons' words on this branch of the subject should be especially suggestive. Throughout these chapters much is properly said about the beauty and variety of the greens of foliage as well as about the colors supplied by the flowers amid the foliage. But in dwelling upon color in this unusually broad and artistic spirit, he has not given equal attention to the question of form. No matter how carefully trees and shrubs may be chosen with regard to their shades of color, no effect will be good unless the same thought has been given to their forms as they will appear when growing toward maturity, and to the final sky-line of the plantations. These facts Mr. Parsons clearly indicates in his introduction, but they might well have been enlarged upon in the subsequent portions of his book.

The texture of different kinds of foliage is another interesting matter, and one to which he barely refers. Trees of similar habit and a similar shade of green may vary much in aspect, according as their foliage is thick or thin, large or small-leaved, and endowed with more or less mobility when touched by the breeze; and the planter who does not recognize this fact loses many chances for increasing the beauty of his arrangements, although, of course, he does not run so great a risk of producing ugly effects as though he neglected to think of form or of color.

The lists of plants which Mr. Parsons gives as displaying their chief beauty during successive seasons of the year will probably be the most helpful, as they are the most complete, feature of his book. Of course, it is as difficult to draw up such lists to the satisfaction of every one as it is to make faultless collections of "favorite quotations" or of "beauties" from popular authors. A reader who is thoroughly familiar with garden-plants will probably miss some of his special pets from Mr. Parsons' pages, but one who is simply anxious to become familiar with them will certainly not complain that

too few are named. A tenth part of those which Mr. Parsons describes would amply fill home grounds of considerable size with all the variety that the most insatiate planter could desire. One omission seems worth remarking upon. More than once he mentions the Virgilia or White-wood (*Cladrastis lutea*), but he does not mention it when naming the trees which bear conspicuous blossoms in late June or early July, although, with its graceful light green foliage and its great pendent panicles of white blossoms, it is then the most beautiful of all the flowering trees which will flourish in the neighborhoods for which this book is specially helpful.

Mr. Parsons' selection of plants for popular use will meet with general approval. It would have been as well, however, to have omitted some trees and shrubs of abnormal habit and color, or else to include a comprehensive warning against their excessive use. Monotony in color should be avoided by the planter; but it should be avoided more by the employment of different shades of green than by the introduction of plants with purple or brown or yellow or variegated foliage. These may be beautiful and useful when intelligently used, but this means when used sparingly, as rare punctuation marks, in a scheme composed of greens. Every one who is familiar with Mr. Parsons' own practice knows that he realizes this fact. In Central Park, for instance, the eye is far less often offended by too brilliant a spot or mass of foliage than in any other park, American or foreign, which we remember. But the people for whom Mr. Parsons writes are certain to be less experienced and likely to be much less intelligent in these matters than himself, while the attraction of mere novelty will lead them to admire in excess many things which, to the horticulturist and landscape-gardener, are as commonplace as grass and Huckleberry-bushes. We should have been pleased, therefore, if the danger of using too many purple Beeches, golden Elders and spotted Negundos had been minimized by more stringent cautions than Mr. Parsons has given.

"It is," says Mr. Parsons, "the arrangement of foliage, of trees, and shrubs and grass that should compose and characterize the lawn," or, as we should prefer to say, the home grounds. "But," he continues, "I believe in making a distinct and comfortable abode for flowers—in a word, a flower-garden. . . . It should be one where everything conspires to favor the growth of flowers, so that one may gather them without stint. To look only at a tree or shrub satisfies the observer, but flowers, to be enjoyed to the full, must be plucked, their fragrance inhaled, and their beauty of detail admired at leisure." For this flower-garden Mr. Parsons very wisely recommends, above all others, "hardy herbaceous perennial plants," while acknowledging that "it is easy to name shrubs and bedding plants that bear plenty of flowers, and there is certainly no valid objection to planting them in the garden." This chapter on "Garden-flowers" and the following one called "Grandmother's Garden" are admirable, and the annexed plan of a small private place laid out by Messrs. Vaux & Company shows an excellent way to provide a large flower-garden without disturbing the repose and artistic unity of the grounds.

In the chapter on "Bedding Plants" Mr. Parsons sanctions the use of formal beds of brilliant hue because "the universal delight in rich color is satisfied by their employment." But confiding readers will be disappointed if they believe that "the expense of their employment is comparatively small." Of course it does not cost much to buy enough young plants to stock a bed or two in a door-yard. But carpet-bedding on a large scale demands a great preliminary outlay for this purpose every year, or the existence of greenhouses for wintering and starting the plants, and a corresponding force of gardeners to attend to their cultivation and transplantation. The sums annually expended to stock the beds in the Boston Public Garden, or in one of our large cemeteries, where the bedding-out system is extensively developed, are enormous. Again, while Mr. Parsons is undoubtedly right in saying that, were formal color-beds more harmoniously designed, persons of taste would less sternly condemn them, we should have been glad had he likewise accentuated the fact that they are good or bad according as they are properly or improperly placed. The most beautiful pattern-bed in the centre of a wide green lawn is an atrocity, while even a less artistically designed one close to the foundations of a house, or in some small enclosed spot, where a "natural" effect could not well be achieved by the planter, may have a very happy effect. Such beds, it cannot too often be said, are architectural in character, and belong amid formal, if not strictly architectural, surroundings. In the middle of Union Square, or at the entrance of Central Park at Fifth Avenue, nothing else would look so well as those which, year by year, Mr. Parsons tastefully arranges. But even the simple circles of Tulips, which were so beautiful in the latter spot last spring, would have grossly offended the eye if transported to the edge of one of the adjacent lawns, or if set, even in a more secluded locality, at the base of a rock draped with naturally growing creepers. These facts are again among those which Mr. Parsons mentions, and which he respects in his own practice, but he might have urged them more strongly upon his readers. We dissent, however, from his views when he says that the flower or foliage-bed is "apt to look stiff and inartistic" because its extreme edge or border is "usually too sharply cut in outline," and that "to overcome this stiffness of outline, single plants of the Coleus or Geranium size should be set out in the grass just beyond the actual border of the bed," and that lower plants, like Pyrethrums and Alternantheras, "should be brought forward close to the low border, and here and there several of them should be allowed to get over the border and establish themselves in the neighboring grass. This will create a properly related emphasis of outline, a pleasing variety, and irregularity enough to just escape formality. There must, necessarily, be a certain precision of lines, but the treatment should all the time bear a distinct and well-defined kinship to that employed by nature in our fields and pastures."

To our mind this is just the sort of kinship that the treatment of formal beds should not bear. One great reason why the art of gardening lags at the present time behind its sisters is, that gardeners are seldom clear in their minds with regard to the special kind of beauty they wish to attain, or are inconsistent in their efforts to attain it. Hence the confusion, the lack of coherence, and, therefore, of beauty, which mark most of our private grounds and many parts of our public parks. First of all, a natural or a formal scheme should be decided upon, or, if the place be large, a scheme in which natural and formal elements are properly contrasted and yet harmonized. And then the chosen idea should be definitely expressed and boldly carried out. So distinctly artificial a feature as a pattern bed should never be employed at all, except in places where there is no need to mitigate or half-deny its artificiality. If, when boldly formal, it looks too stiff, it had better be done away with entirely, for its stiffness, instead of being "inartistic," is its essential character, and, therefore, is artistic if the environment be such as to sanction its presence at all, and the outline of its border seems to us just the place where this character should be most clearly expressed. We follow Mr. Parsons gladly when he teaches that we often see too mechanical a regularity in the filling of formal beds, feeling that such beds are, in truth, of two kinds—those where delicate stiff patterns are wrought by the use of brilliant, low, close-clipped plants, and those where freer masses of taller plants are grouped in only a semi-formal way. But in both cases the ornamental bed should confessedly be a bed, with a distinctly marked form and outline. Some of the most beautiful beds we remember to have seen were in France, and were filled with white and pink flowered Geraniums, not set in a pattern but mingling naturally together. But the shape of these beds was marked, and their character expressed, by a low close-clipped border of some other sort of plant. In short, while a natural arrangement should be consistently natural, a formal arrangement should as consistently be formal. The only question is, whether the one or the other will look best in the given spot.

The charming chapter on the "Ornamentation of Ponds and Lakes" was noticed in these columns when it appeared, not long ago, in one of the magazines. The one on "City Parks" gives an interesting account of the formation of Central Park, but we should have liked to see the great skill of its designers more strongly emphasized as it is revealed in the arrangement of the roads and walks. In a small place planting is the landscape-gardener's chief task; but in a large place, and above all in a public park, where crowds of persons on foot and in carriages must be accommodated, and must have the various portions of the enclosure beautifully revealed to their passing eyes, his preliminary work in laying out the roads is almost more important and even more complicated and exacting. This work has been exceptionally well done in Central Park, while it was exceptionally hard to do it well, owing to the broken character of the ground.

"Landscape-gardening" is handsomely printed and bound, and profusely illustrated; but the larger illustrations, although often taken from very interesting objects or scenes, are not all of the first quality. On the whole, the volume is one for which we are grateful, and one which should do much to stimulate an interest in plants and planting and garden arrangement. There is still need, however, for a companion volume, in the shape of a systematic treatise on landscape-gardening considered primarily as an art of design.

Notes.

In November, we read in a recent book about Japan, "the coquette sends her lover a leaf or branch of Maple, to signify that, like it, her love has changed."

Mr. E. T. Ensign, Forest Commissioner of the State of Colorado, announces in a circular that the citizens of Colorado Springs have secured the reservation of extensive bodies of timber-land at the sources of the springs, in Pike's Peak region. It is to be inferred from the wording of the circular that these reservations are to be made by proclamation of the President.

The horticultural building for the World's Fair at Chicago, which has been designed by Mr. W. Jenney, of that city, will cost, it is said, about $600,000, and will stand on the edge of the lagoon. It will be 1,000 feet in length and 286 feet in breadth, and will consist of a central pavilion connected with two others by glazed galleries. This central space will be 187 feet square and 113 feet in height, and will be devoted to the display of tropical plants.

Some of the perennial Gypsophilas and Statices, especially *G. paniculata* and *S. latifolia*, are highly valued for their cut flowers, which are small and abundant and borne on slender stems, and, when mingled with other flowers, have the effect of a fine mist or halo. Another excellent plant for this purpose is *Asperula hexaphylla*. A specimen sent to this office from the Passaic Nurseries by H. Meyer, has minute flowers, pure white, and borne on a very loose panicle, and they have a fairy-like delicacy. A well-grown plant will make a mass three feet in diameter and nearly as high.

La Revue Horticole announces the death of Monsieur F. Hérincq, in his seventy-first year. Monsieur Hénricq was long connected with the Herbarium of the Museum d'Histoire Naturelle, in Paris, and was known to horticulturists as the editor of *L'Horticulteur Français*, a periodical which he founded, and which ceased to appear several years ago. He was intimately associated with the late Monsieur Lavallée in the study and arrangement of the plants in the Arboretum Segretzianum, and assisted in preparing the important work which Monsieur Lavallée, published under that name.

The *Planter*, of New Orleans, recently put forth a novel suggestion with regard to the employment of the low grades of molasses, which sugar manufacturers now do not know how to get rid of even at five, six or seven cents a gallon. So the *Planter* advocates the unfamiliar idea of using it as fuel in the place of coal in the sugar-houses. Combined with the dry stalks of the Sugar-cane, after the saccharine matter has been extracted from them, it would burn with a high heat, while it would cost from one-eleventh to one-fifth of a cent per pound as against the one-fifth of a cent now expended for coal; and even half the now available stock of molasses would, we are told, more than suffice for the manufacture of all the sugar of Louisiana.

A correspondent of the London *Standard* recently proved that the Edelweiss, that secluded inhabitant of high Alpine regions, may make itself thoroughly at home in a city, by telling about a small plant which a friend living near Belfast had raised from seed and sent him, with directions to leave it to itself in a corner of his garden. "Unhappily," he says, "London gardens are the hunting-grounds for innumerable cats, so I placed my treasure, for such I deemed it, on the sill of my drawing-room window, aspect south-east; and there, through the dismal sunless winter, now buried deep in snow, now frozen hard, the Alpine stranger remained, always reported dead by all who saw it; but toward the end of March life showed itself, and now it is a large healthy plant, with five lovely blooms, the admiration of all who see it."

We have recently received the prospectus of a new periodical, called *Zeitschrift für Pflanzenkrankheiten* (*Journal of Plant Diseases*), which is to be issued at Stuttgart, under the control of Dr. Paul Sorauer, who will have the assistance of the International Phytopathological Commission, which includes members residing in all the civilized parts of the world, the American members named in the prospectus being Professor Farlow, of Cambridge; Professor Galloway, of Washington, and Professor Humphrey, of Amherst. The journal will be published bi-monthly, with lithographed plates and wood-cuts in the text, and the annual subscription price has been fixed at fifteen marks. It will contain original articles of considerable length, shorter notes on subjects of current interest and full reviews of new books and treatises, and should be of great use to all who are concerned with the cultivation of plants.

In the preface to Mr. E. W. Hervey's interesting "Flora of New Bedford and the Shores of Buzzard's Bay," which we have already brought to the attention of our readers, he says that comparative reference to catalogues of various western localities shows that the blossoming season is earlier there than on the shores of the Atlantic. A catalogue of the plants found at Oquaka, Illinois, on the shores of the Mississippi, "discloses the interesting fact that the season there . . . is much earlier than that of New Bedford by the sea, though both places are practically in the same latitude, the spring plants of the former region blooming from ten to fifteen days earlier, and those of May, June and July from three to four weeks earlier," while an article by Mr. E. W. Hammond on "Winter Flowers in Oregon," published in Garden and Forest last January, seems to prove "that the season on the Pacific coast in latitude one degree further north is six weeks earlier than here."

Dr. Richard Schomburgk, for the last twenty-five years director of the Adelaide Botanic Garden, died there at the end of last March. He was a native of Freeburg, and was born in 1811. Political complications compelled him, with his brother Robert, to leave Germany. With the assistance of Humboldt he was able to reach Australia, where he has principally resided. In 1871 he published a catalogue of the plants cultivated in the Adelaide garden, and his elaborate annual reports testify to the energy and activity which he displayed in carrying on the establishment entrusted to his care. He published in 1876 his "Botanical Reminiscences of British Guiana," an interesting account of the Boundary Expedition of 1842, which was commanded by his brother, and to which he was attached as naturalist on behalf of the Prussian Government. His most important contribution to botany is, however, the synopsis of the flora of British Guiana, published in his "Reisen in Britisch Guiana" in 1848.

A recent number of the *American Architect and Building News* contains an interesting article on the great island of New Guinea, the least-known of any country on the globe. After speaking of the houses built on piles, the writer describes another type of house, which seems even more primitive, as it appears in an illustration reproduced from a photograph. The picture shows a sort of small clearing on a steep hill-side, and in the centre of it a tall, rather slender tree, apparently a Blue-gum, the head of which has been lopped off, so that nothing remains but a few short branches with scattered tufts of leaves springing from their extremities. About thirty feet above the ground, approached by a very frail-looking ladder and supported by the main branches, some distance above the place where they fork, stands the house which, oddly enough, always contains two stories, and has a platform on top whence the surrounding country may be scanned for signs of approaching danger. Resting thus on the lopped and naked tree, with the ragged thatch of its sides and roof hanging down in rough streamers, it looks not unlike a colossal nest—such a nest, on a larger scale, as the fish-hawk builds in blasted trees along our own Atlantic coast. Our "arboreal ancestors" seem closer to us as we think of human habitations in the tree-tops at the close of the nineteenth century.

The fact that the authorities of Kew Gardens have been endeavoring for a number of years to extend the scope and enlarge the usefulness of the various botanical establishments in the British West Indies has already been alluded to in these columns. To further this undertaking, which looks to the formation of a botanical federation for purely economic purposes, and which is likely to be beneficial to all English-speaking people in the Antilles, Mr. D. Morris, the Assistant Director of Kew, was sent last winter to make a tour of inspection through the West Indies. His report, containing much useful and interesting matter pertaining to the different islands, is now published in the May and June issues of the *Bulletin of Miscellaneous Information* from the Royal Gardens. The information it contains will be found useful not only to Englishmen, but to Americans who now visit the West Indies in larger numbers every year, both for business and pleasure. An appendix to the same useful publication contains a list of the new garden-plants described in botanical and horticultural publications, English and foreign, during the year 1890. It includes not only plants brought into cultivation in that year for the first time, but the most noteworthy of those which have been introduced after being long lost from gardens. In addition to these the list contains all hybrids, whether introduced or of garden origin, but described for the first time in 1890. The list will be found indispensable to all people who desire to keep informed of new plants available for garden decoration.

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The Use of City Parks.

A FEW weeks ago the Park Board of this city granted permission to hold a public meeting in Battery Park. Whether or not the Board is clothed with any authority under the law to grant a privilege of this sort has been questioned, but it is not our present purpose to discuss this point. The meeting, however, deserves some mention; not because the park was in any way defaced or injured on that occasion, but because it was the first time, at least for many years, that any such a gathering has been held in any of the city parks proper. Manhattan Island is so densely inhabited, and its population multiplies so rapidly, that the pressure for more room is stronger here even than it is in most other cities. There is not a foot of open space which is not constantly coveted by some one for some purpose which seems a worthy one. But our parks have never been in any serious danger of invasion by public assemblies. Great efforts have been made to turn Central Park at times into a parade-ground for the display of our citizen soldiery, but we rarely hear of attempts to convert it into an arena for public argument and debate by civil or religious bodies.

In some sister cities labor organizations have endeavored to meet in pastoral parks to urge the enactment of an eight-hour law or agitate some other subjects of so-called reform. Religious organizations also have endeavored to secure the same privileges; and the arguments in favor of such assemblies are always the same. It is held, in the first place, that the parks belong to the people; next, that the people have the right to public assemblage, and that, therefore, they have the right to assemble on their own grounds. In most cases, too, it is urged that the matter to be discussed is of vital moment. Religious enthusiasts are convinced that in some way the salvation of men depends upon their efforts, and that their exclusion from the public parks means practically the ruin of human souls. In the same way agitators for some civil or political reform always feel and insist that the movement which they represent is one of paramount importance. The present case is remarkable in that the meeting in Battery Park was called for the express purpose of protecting it. The park is now contracted and disfigured by a railway which is constantly threatening more serious encroachment. This corporation needs room, and it could occupy to advantage the entire park area. Having obtained a foothold, each new aggression is more easy and natural, in spite of the fact that the border, which is now covered and blackened by the roads, makes a mute protest to every passer-by against the invasion. It is a fact, however, that the road is there only on sufferance; that the contract under which its owners have possession is a revocable one, and that it is in the power of the Park Commission to order the corporation to remove its structure. It was to advocate such a forcible removal of the railway that the meeting was called by some citizens, who felt that their rights had already been trampled on, and are in danger of further violation.

Here, then, was a singular case. If any one assemblage could ever be tolerated in a city park it would assuredly be a meeting of its defenders in the place they wished to save from ruin; and yet we cannot but feel that a precedent like the Battery Park meeting is a bad one to establish. It is true that every man in the city has a right in its parks, but he only has a right to them as parks, and no one has a right to them as anything else than a park. It will hardly be contended that there is only one justifiable reason for a public meeting in an urban pleasure-ground. If it is right to assemble to make a protest against invasion by a railroad, it is right to meet there for other purposes. Indeed, no sooner had this permit been granted than some of the people in the other end of the city declared that they would organize a meeting in Mount Morris Park for a directly opposite purpose—that is, the people at the northern part of Manhattan Island demand greater facilities for rapid transit, and inasmuch as it is their opinion that this can be more easily obtained by giving the Battery to the railroads, some of them are willing to make this concession; if it is proper for one side to make its argument before an assemblage in a park, it is equally proper for the other side to have the same privilege.

Of course, no city of any consequence should be without provision for public assemblies, such as the large open space in front of the main entrance to Prospect Park, in Brooklyn, and the area north of Union Square in this city, where preparation has been made for furnishing light and other conveniences needed at popular meetings. But, aside from the fact that such gatherings would be ruinous to the verdure of a pastoral park, nothing more discordant with the spirit of such a place can be conceived than an indignation meeting or a public demonstration in favor of some "cause" or "movement," for these would bring into the park the throng and stress and excitement and struggle which are the very things from which such quiet scenes are designed to offer relief. The only security which urban parks can have against destructive invasions of one kind or another is a universal public appreciation of the truth that their real purpose is the refreshment of mind and body which simple rural scenery alone furnishes. That this is not generally understood is proved every year by the efforts of many cultivated people to divert our parks to some other use, which seems to them a higher and a nobler one. But the truth is, that this distinctive function of city parks is by no means trivial or insignificant; indeed, it is quite as essential to the well-being of society, as it exists in modern cities, as are hospitals or schools or libraries or churches, and it is this serious estimate of their value which impels us so often to urge upon thoughtful and public-spirited men and women the duty of watching over them with jealous care, in order to prevent them from being perverted to any illegitimate use, and to protect them from every invasion which threatens to diminish, in the slightest measure, their beneficent influence.

Four Pictures of Gardens.

As the art of gardening has varied in different lands and successive ages, literature has recorded its work, usually painting with sympathetic touch the current fashions of the time, but in our day often going back with a sympathy as great to explain the charms of now neglected kinds of beauty. Some of the pictures thus built up in delightful phrases are famous and familiar, like Pliny's and Evelyn's and Bacon's. But others, though perhaps written by well-known authors, are less frequently quoted when the art of gardening is discussed; and four of these, sharply contrasting with each other, will perhaps make an interesting little gallery if hung here side by side. We have not been at pains to pick them out of the books where they first saw the light. With many others almost as detailed, and with a few that are much more elaborate, they may be found in Mr. Sieveking's delightful volume called "The Praise of Gardens."

The first is a portrait, painted by Sir William Temple, who lived between 1628 and 1700, of the garden at Moor Park, in Hertfordshire, which "was made by the Countess of Bedford, esteemed among the greatest Wits of her Time . . . and with very great Care, excellent Contrivance, and much Cost." "Because," explains further Sir William, "I take the Garden I have named to have been in all Kinds the most beautiful and perfect, at least in the Figure and Disposition, that I have ever seen, I will describe it for a model to those that meet with such a Situation and are not above the Regards of common Expence."

It lies on the Side of a Hill (upon which the House stands), but not very steep. The Length of the House, where the best Rooms and of most Use or Pleasure are, lies upon the Breadth of the Garden; the Great Parlour opens into the Middle of a Terras Gravel-Walk that lies even with it, and which may be, as I remember, about three hundred Paces long and broad in Proportion, the Border set with Standard Laurels, and at large Distances, which have the Beauty of Orange-Trees, out of Flower and Fruit; from this Walk are Three Descents by many Stone Steps, in the Middle and at each End, into a very large Parterre. This is divided into Quarters by Gravel-Walks, and adorned with Two Fountains and Eight Statues in the several Quarters; at the End of the Terras-Walk are Two Summer-Houses, and the Sides of the Parterre are ranged with two large Cloisters, open to the Garden upon Arches of Stone, and ending with two other Summer-Houses even with the Cloisters, which are paved with Stone and designed for Walks of Shade, there being none other in the whole Parterre. Over these two Cloisters are two Terasses covered with Lead and fenced with Balusters; and the Passage into these airy Walks is out of the two Summer-Houses, at the End of the first Terras-Walk. The Cloister facing the South is covered with Vines. . . . From the middle of this Parterre is a Descent by many Steps flying on each Side of a Grotto, that lies between them (covered with Lead and flat) into the lower Garden, which is all Fruit-Trees, ranged about the several Quarters of a Wilderness which is very Shady; the Walks here are all Green, the Grotto embellish'd with Figures of Shell-Rock-work, Fountains and Water-works. If the Hill had not ended with the lower Garden, and the Wall were not bounded by a common Way that goes through the Park, they might have added a Third Quarter of all Greens; but this want is supplied by a Garden on the other Side of the House, which is all of that Sort, very Wild, Shady, and adorned with rough Rock-work and Fountains.

Next to this portrait of one of these old English gardens which, alas, have almost wholly disappeared under the hand of iconoclastic fashion, may come a picture, drawn, in 1780, by William Beckford, the builder of Fonthill, and representing the celebrated Boboli garden at Florence, which still keeps much the same look it wore a hundred years ago.

This garden lies behind the Grand Duke's palace, stretched out on the side of a mountain. I ascended terrace after terrace, robed by a thick underwood of Bay and Myrtle, above which rise several nodding towers, and a long sweep of venerable wall, almost concealed by Ivy. You would have been enraptured with the broad masses of shade and dusky alleys that opened as I advanced, with white statues of fauns and nymphs and sylvans glimmering amongst them; some of which pour water into sarcophagi of the purest marble, covered with antique rilieves. The capitals of columns and ancient friezes are scattered about as seats. On these I reposed myself and looked up at the Cypress groves which spring above the thickets; then, plunging into their retirements, I followed a winding path which led me by a series of steep ascents to a green platform overlooking the whole extent of wood, with Florence deep beneath, and the tops of the hills which encircle it jagged with Pines; here and there a convent, or villa, whitening in the sun. This scene extends as far as the eye can reach.

Still ascending, I attained the brow of the eminence, and had nothing but the fortress of Belvedere and two or three open porticoes above me. On this elevated situation I found several walks of trellis-work, clothed with luxuriant vines. A colossal statue of Ceres, her hands extended in the act of scattering fertility over the country, crowns the summit. Descending alley after alley, and bank after bank, I came to the orangery in front of the palace, disposed in a grand amphitheatre, with marble niches relieved by dark foliage, out of which spring Cedars and tall aerial Cypresses. This spot brought the scenery of an antique Roman garden so vividly into my mind that . . . I expected every instant to be called to the table of Lucullus, hard by in one of the porticoes, and to stretch myself on his purple triclinias.

How different from this is the scene Miss Mitford paints in "Our Village," describing a typical English cottage-garden.

The pride of my heart and the delight of my eyes is my garden. Our house, which is in dimensions very much like a bird-cage, and might with almost equal convenience be laid on a shelf or hung up in a tree, would be utterly unbearable in hot weather were it not that we have a retreat out-of-doors —and a very pleasant retreat it is. To make my readers comprehend it I must describe our whole territories. Fancy a small plot of ground with a pretty, low, irregular cottage at one end; a large granary divided from the dwelling by a little court running along one side; and a long thatched shed, open towards the garden, and supported by wooden pillars, on the other. The bottom is bounded half by an old wall and half by an old paling, over which we see a pretty distance of woody hills. The house, granary-wall and paling are covered with vines, Cherry-trees, Roses, Honeysuckle and Jessamine, with great clusters of tall Hollyhocks running up between them; a large Elder overhanging a little gate, and a magnificent Bay-tree, such a tree as shall scarcely be matched in these parts, breaking with its beautiful conical form the horizontal lines of the buildings. This is my garden; and the long pillared shed, the sort of rustic arcade, which runs along one side, parted from the flower-beds by a row of rich Geraniums, is our out-of-door drawing-room. I know nothing so pleasant as to sit there on a summer afternoon, with the western sun flickering through the great Elder-tree and lighting up our gay parterres, where flowers and flowering shrubs are set as thick as grass in a field, a wilderness of blossoms, interwoven, intertwined, wreathy, garlandy, profuse beyond all profusion, where we may guess that there is such a thing as mould but never see it. . . . Nothing so pretty to look at as my garden! It is quite a picture, only unluckily it resembles a picture in more qualities than one—it is fit for nothing but to be looked at. One might as well think of walking in a bit of framed canvas. There are walks, to be sure—tiny paths of smooth gravel, by courtesy called such—but they are so overhung by Roses, and Lilies, and such gay encroachers—so overrun by Convolvulus and Heart's-ease and Mignonette, and other sweet stragglers, that, except to edge through them occasionally for the purpose of planting, or weeding, or watering, there might as well be no paths at all.

Very different again, in subject and treatment, is this picture of an Oriental garden, painted in "Eothen," by Alexander Kinglake:

Wild as the nighest woodland of a deserted home in England, but without its sweet sadness, is the sumptuous Garden of Damascus. Forest-trees, tall and stately enough, if you could see their lofty crests, yet lead a bustling life below, with their branches struggling against strong numbers of bushes and willful shrubs. The shade upon the earth is black as night. High, high above your head, and on every side all down to the ground, the thicket is hemmed in and choked by the interlacing boughs that droop with the weight of roses, and load the slow air with their damask breath. The Rose-trees which I saw were all of the kind we call damask; they grow to an immense height and size. There are no other flowers. Here

and there, there are patches of ground made clear from the cover, and these are either carelessly planted with some common and useful vegetable, or else are left free to the wayward ways of nature, and bear rank weeds, moist-looking and cool to the eyes, and freshening the sense with their earthy and bitter fragrance. There is a lane opened through the thicket, so broad in some places that you can pass along side by side; in some so narrow (the shrubs are forever encroaching) that you ought, if you can, to go on the first and hold back the bough of the Rose-tree. And through this wilderness there tumbles a loud, rushing stream, which is halted at last in the lowest corner of the garden, and then tossed up in the fountain by the side of the simple alcove. This is all. Never for an instant will the people of Damascus attempt to separate the idea of bliss from these wild gardens and rushing waters.

Notes from a Wild Garden.

MY wild garden is a narrow strip of land, less than an acre in extent, which I began to plant four years ago. Some twenty years before this it had been planted with Grape-vines, which were dug out so thoroughly that they have not since troubled me by sprouting. Already this little spot begins to assume quite a wild and woody look. A group of Sassafras trees is especially fine. Sweet Gum, Wild Cherry and Maples are also making a good growth. Conifers are doing well, none better than the Hemlocks. The finest one, planted four years ago this spring when less than three feet in height, now measures nine feet high, with a spread of branches eight feet in diameter. It is graceful and luxuriant, with nowhere a dead twig to be seen.

The frost of early May injured a good many trees and shrubs, among others the Hollies, Mulberries and English Walnut-trees; also the Japanese Akebia and Actinidia, but they are now growing rapidly, and are apparently making up for lost time.

Among the herbaceous plants is *Xerophyllum setifolium*, which is considered a most difficult plant to cultivate, but I have succeeded in establishing a number of fine plants. They were set four years ago, and this spring twenty-three bloomed, making a fine display. I was told by those who had tried to cultivate it that it would surely not live longer than the first summer. But I was undismayed, and had a strong man take up the plants with such great balls of earth that some of them could hardly be crowded into a bushel basket. I stood by during the removal, and rejected every one that could be suspected of mutilation. We had a great wagonful of them and other plants, and when we reached home the Xerophyllum was set in a trench somewhat lower than the surrounding ground, and well watered. This is all the care they have ever received, beyond an occasional watering the first summer, and every plant is flourishing.

Helonias bullata is also growing nicely. This charming plant blooms among our earliest flowers in April. Notwithstanding that its native home is only in dense Cedar swamps, where it is often entirely covered with water, it is not difficult to grow in common garden-soil. It is a rare local plant, belonging in the Lily-family, and in early spring sends up a naked flower stem, a foot or two high, surmounted by a dense raceme of showy purple flowers. The leaves are evergreen, and are handsome the entire year.

Under and among the trees and shrubs many creeping plants have become at home and are growing nicely. Trailing Arbutus blooms freely here, as does the Partridge-berry, while the aromatic Wintergreen is full of bloom now, with promise of pretty clusters of scarlet berries in late autumn and winter. The wild Yam is here too, climbing about in its graceful way. This vine is much handsomer and far more delicate than the Chinese Yam, which florists are sending out under the name of Cinnamon Vine. *Apios tuberosa* is clambering about here and there without care, having been brought in among clumps of plants from the damp Pines, where it is very abundant. But it is quite welcome here, with its dense clusters of fragrant dull purple flowers.

Wild Lilies and cone-flowers, Rudbeckias, and various Sunflowers, with one species of Golden Rod, *Solidago odora*, are now in bloom. Groups of Yucca, too, are scattered about with their wealth of flowers on the tall stems, which in the moonlight look like ghosts.

Among the shrubs, *Azalea viscosa* is still in bloom, and *Clethra alnifolia* is just beginning to open its flowers. This is one of our most desirable shrubs. Its dense raceme of white flowers is fragrant and handsome, and it remains in bloom a long time, commencing about the middle of July and continuing through August. The sweet-scented shrub Calycanthus is still in flower, and so are wild Roses from the Pines. But among the most attractive features of the wild garden are the Ferns, of which there are several species perfectly at home, growing luxuriantly in the shady places.

Vineland, N. J. *Mary Treat.*

Southern California Notes.

THE tall scarlet Larkspur (*Delphinium cardinale*) was introduced into cultivation, I believe, about the year 1858, from California. It has figured repeatedly in recent years as a novelty, although it may be found quoted constantly in many European catalogues.

I have lately seen this showy plant in great abundance on hill-sides east of San Diego, where the brush had been burned off the preceding fall. Attaining a height of five to ten feet, and covering densely almost the entire hill-side bordering the Potrero valley, the brilliant flaming flowers produced a striking resemblance to a hill-side on fire.

The large perennial roots, when in a dormant condition, may be sent with safety in a perfectly dry condition to any part of the world. The plants are also easily produced from seed, and will thrive luxuriantly in any rich soil. They are considered quite hardy. The sepals and two lower petals are scarlet; the two upper petals a delicate lemon-yellow tipped with scarlet and with a portion of the back also scarlet. The stigmas are tipped with scarlet. The sepals are tipped with a delicate pea-green, but scarlet is the predominating color, and unless closely examined no other color will be observed.

Dormant roots of *Dodecatheon Clevelandi*, sent to France in a dry state the past season, failed to grow in all but a few cases. No reports have yet been received from England or Holland, where roots were also sent, but as they are catalogued it may be presumed that they did well under proper treatment. This lovely plant has been denounced as one of the novelties lacking positive merit, but it is doubtless the handsomest of the genus. The centre of the flower is a rich prune-purple, bordered with bright lemon-yellow, the reflexed divisions of the corolla pure white, or tipped with lavender or phlox-purple. In individual plants the divisions are sometimes pure white throughout, or of a deep, brilliant purple, or of an intervening tint.

Papaver Californica is another plant of recent introduction. The flowers are about two inches in diameter, of a bright saturn-red to orange-chrome color, the centre of a delicate sulphur-yellow. Max Leichtlin writes that it has flowered with him the past season, but, while he considers it interesting botanically, he does not consider it worth cultivation. It has been curiously described in one catalogue as possessing flowers ten inches across, and of a different color from its own.

The effect of fire upon the vegetation of a country is an interesting subject for investigation. For the past twelve years I have been botanizing in southern and Lower California, and only in late years has *P. Californica* been seen either by myself or other botanists. John Spence was the first to find it on brush-lands in the Santa Ynez Mountains, but only found it where the land had been stripped by fire. In 1889, I believe, I first found it east of San Diego, near Campo, at a similar elevation, where the land had previously been burned over. Last year I found it sparingly in the same locality, and in great profusion in another locality near by that had been burned over the preceding fall. This year I could find no trace of the plant in either of these burnt areas. But between the two localities, where brush-fires raged last fall, I found it thriving.

Wherever fire has raged the previous year I have not failed to find this Poppy, but the second, or third year at most, it seems to again entirely disappear. As I have traveled over the same route yearly, its presence in previous years would have been detected long ago by myself and others as well.

In the mountain districts denuded by fire, the following spring is sure to reveal a wealth of unsuspected beauty. *Dicentra chrysantha*, in some localities, is sure to become surprisingly abundant. The scarlet Larkspur, as above noted, owes its luxuriance and abundance to the preparation of the soil by fire for its reception. *Calochortus Weedii* often appears by thousands in a burnt district where its presence previously was scarcely suspected. *Phacelia Orcuttiana*, as well as *Papaver Californica*, appears to be a "fire-plant." And the number of other plants which are found in their greatest profusion and at their best in a burnt area are legion. In a few years such plants retire again into comparative obscurity.

The Pride of California (*Lathyrus splendens*) is one of these plants which seem to be benefited by the ordeal of fire, which renders the vine more prolific and adds brilliancy to the blossoms.

Orcutt, Cal. *C. R. Orcutt.*

New or Little-known Plants.

Pinus cembroides.

THE Mexican Nut Pine (*Pinus cembroides*) is rather a recent addition to the silva of the United States, it having been detected only a few years ago for the first time within our territory, on the Santa Catalina Mountains of Arizona, by Mr. C. G. Pringle. Last year the same tree was found by Mr. Brandegee forming a forest on the flat top of the Sierra de Laguna, in Lower California, where it sometimes grows to the height of fifty feet, with a short stout trunk and a round top resembling in general appearance the better-known Nut Pine of Colorado and New Mexico, to which this species is very similar, except in foliage, which is much thinner than that of the other Nut Pines which form the small section to which Engelmann has given the name *Cembroides*. These trees are distinguished by their short subglobose cones with thick unarmed scales, large edible seeds with minute wings, and usually stout leaves varying from one to five in a sheath. *Pinus cembroides* is widely distributed through northern Mexico, where it often forms open scattered forests of considerable extent on the lower slopes of the mountain-ranges. The seeds, which are sold in the markets of all Mexican cities, form an important article of food, and are eaten roasted like peanuts or are ground into flour.

The illustration on page 353 is made from one of Mr. Brandegee's Lower California specimens. An earlier figure can be found in Forbes' "Pinetum Woburnense," an exceedingly rare work, of which only a hundred copies were printed, and in which our tree is called *Pinus Llavana*. This figure is reproduced in Antoine's "Conifers."

Iris Robinsoniana.

THIS is one of the most interesting of all cultivated Iridaceous plants. It was discovered in Lord Howe's Island by Mr. Charles Moore, Director of the Botanical Gardens at Sydney, who wrote of it, in 1869: "A large Iridaceous plant, termed the Wedding Flower, was found sparingly in two or three situations. Of this only seed-vessels were obtained, but the flowers are described as being very beautiful. The leaves were upward of six feet long, and from two to three inches wide. In appearance it resembles a large species of Moræa, but it will probably prove a new genus."

In 1872 Dr. G. Bennett communicated to the *Gardeners' Chronicle* an account of the plant as he had seen it growing in the Sydney Gardens under Mr. Moore's care. Bentham, in his *Flora Australiensis* (1873), describes the plant under Moræa, and states that it is the largest species of the genus, the habit of the plant being that of the nearly allied *Pardanthus Chinensis*, and the flowers nearly those of *Moræa iridioides*.

The introduction of this plant into English gardens, no doubt, took place soon after it was noticed in the *Gardeners' Chronicle*. There were large specimens of it in several gardens known to me twelve years ago, for the plant grew vigorously enough although it would not bloom. The example now flowering at Kew, and of which the accompanying figure (p. 355) is a photograph, is growing in the south end of the house devoted to large succulent plants. It is close to the doors, which are open all day during summer, and it is never shaded. Its habit and height are well shown in the photograph. The leaves are six feet or more long, by three inches in width, and the scape is six feet high to the first branch. The flowers are expanded in the morning and permanently close again before night. Each sheath will produce nine or more flowers, one after the other. The first flowers expanded on June 21st, since when up to to-day, July 3d, there have been 157 flowers. There is every promise that this number will be more than doubled. Eighteen flowers were the most we have had open together.

Each flower measures four inches across, the segments spreading almost flat, the three outer larger than the inner, all of them pure white, of about the same texture as the petals of *Phalænopsis grandiflora*. There is a crescent-shaped blotch of golden yellow at the base of each of the three outer segments.

The species is found wild only in Lord Howe's Island, and it is the only Iris or Moræa known in the whole of Australia. It is a noble plant, and worth cultivating for its foliage, as well as an exceedingly beautiful object when in flower. Unfortunately, only four flowers were expanded at the time when the photograph was taken.

Kew. *W. Watson.*

Foreign Correspondence.

London Letter.

Conference on Hardy Herbaceous Plants.—The Royal Horticultural Society had arranged a two days' exhibition and conference to be held at Chiswick this week, the special object being the popularization of hardy herbaceous plants, which, in the opening remarks at the conference, was said to be, "as a rule, overlooked by gardeners." Mr. W. Robinson, of *The Garden*, contributed a paper on Wild Gardening, in which he advocated the planting among meadow-grass large quantities of such plants as Daffodils, Bluebells, Snowdrops, etc. It was asked what chance such plants would have in the struggle that would ensue between them and the grass, and particularly such enemies to bulbs as wire-worms, etc., and some one recommended feeding the worms with rapecake.

[The baiting of wire-worms has been found the most effective remedy for these pests in this country. The arsenites mixed with corn-meal dough or sprinkled on other baits are generally recommended.—Ed.]

The Rev. Mr. Ewbank, of the Isle of Wight, treated upon summer-gardening as practiced by himself. Mr. Ewbank is one of the few amateur horticulturists in England who delight in plants which other people find difficult to manage. His garden is, therefore, the home of the outcast and the unknown, and it is the scene of not a few very interesting experimental cultures and horticultural triumphs. The next paper was contributed by Miss Jekyll, who is known as a first authority upon æsthetic gardening. Names are of no account, labels are an abomination in this lady's garden, and no plant that is not decidedly beautiful to look at and easy to grow receives any attention from her. She and Mr. Ewbank practice the two extremes of hardy-plant culture. Of course, every one deprecated the total removal of labels. Who has not experienced the relief afforded by the label of a plant whose name is inquired after and which one feels he ought to know? If only a glimpse of the beginning or end of the name is caught it is recalled at once.

The second day's conference was devoted to strawberries chiefly; other fruits, such as gooseberries, raspberries and currants, also receiving attention, both from lecturers and exhibitors. The papers dealt chiefly with the cultural requirements and merits of the different fruits treated upon, and, while they contained much useful information, they revealed nothing new in the shape of novelty.

The exhibition of flowers was a pretty full one, and comprised all the popular summer-flowering herbaceous plants, as well as a few which are yet scarcely known. Unfortunately, the rain fell in torrents on both days, so that a most interesting exhibition and instructive conference were enjoyed by very few.

Lilium Lowii, Baker, new species.—This is a new Indian Lily which has just flowered in the nurseries of Messrs. Hugh Low & Co., at Clapton, and has been submitted to Mr. Baker for naming. It belongs to the Polyphyllum group, and is closely related to *L. Nepalense*, differing from this species chiefly in having smaller narrower leaves, flowers more distinctly funnel-shaped and colored white, with a few blotches of purple on the inside of the segments.

This is the third new addition to garden Lilies made by the Messrs. Low, the first being *L. Nepalense*, discovered by Wallich fifty years ago, but never introduced into England until two years ago, when the Clapton firm imported a quantity of it from the Central Himalayas. It is a most beautiful and stately Lily, a yard or more high, bearing a head of three or five flowers five inches long and nearly as broad, the segments recurved and colored lemon-yellow, the tube deep crimson inside, spots of the same color extending some dis-

tance up the segments. Here it requires the protection of a greenhouse.

About the same time the same firm introduced a grand variety of *L. Wallichianum*, which was named Superbum at Kew, and which is one of the most beautiful of all Lilies. Its flowers are as large as those of *L. Harrisi*, but wider and more campanulate, their color being creamy white, with a blotch of lemon-yellow in the throat. It also requires greenhouse treatment. Although a good garden Lily in appearance, yet the new *L. Lowii* is not equal in beauty to the other two.

ROSE REINE BLANCHE.—This is a new semi-double Rose which was submitted to the Committee of the Royal Horticultural Society at their last meeting by Mr. Ladham, of Shirley Nurseries, Southampton, and it received a certificate. Its beauty is in the dash of crimson on the margins of the otherwise pure white petals, and before the buds unfold this color has a very pretty effect. The open flowers are particularly charming, and they are as large as the flowers of *Anemone Japonica*. I am unable to state the origin of this Rose, but it is certainly a variety of the south European *R. Gallica*. It appears to be very free-flowering, and, altogether, I should say it is likely to prove a popular Rose wherever the single or loose-flowered Roses are in favor.

London. *W. Watson.*

Fig. 59.—Pinus cembroides.—See page 352.

Cultural Department.

The Strawberry Season.

THE Strawberry crop of 1891 was a good one, much above the average. A favorable season, cool with sufficient moisture, contributed to a steady, healthy growth. The frosts of May, which excited so much alarm, did no injury in this vicinity, with a single exception, in which case the plants were almost entirely Sharpless and Great American. These varieties, besides being probably more tender than others, expose their flowers more. Within two or three mornings after the blossoms began to open I watched my plants closely, expecting much injury, but I found less than is frequently the case. This was, doubtless, due to the dryness of the air; with rain or heavy dews the damage would, no doubt, have been greater. This dryness of the air, together with the protection of the calyx, saved our peaches and cherries also, and rendered the published reports of great damage entirely premature.

Our Strawberry season opened May 25th, with a pint of Michel's Early, and closed, July 6th, with a quart of Stayman's No. 1 and Parker Earle. The birds anticipated us two or three days.

Michel's Early is a strong, vigorous grower, with tall, erect foliage, berries scarlet in color, of good size and quality, and from four to five days earlier than any others in my collection. It is moderately productive, and is desirable for family use on account of its earliness and quality; for these same reasons it may be desirable for near markets. Rusk, or Lady Rusk, was much more productive; it is dark crimson in color, average to large size, but it is in no way noteworthy. It is claimed that this berry dries up without rotting, but this claim did not prove valid. The Parker Earle has more of this quality than Lady Rusk. We shall hold this berry for another season's trial. Haverland is a handsome, perfect-shaped berry, long cone-formed, with a neck and reflexed calyx, of very good quality, and it is productive, all of which are prime requisites in a berry for popular favor. Stayman's No. 1 is a good grower, berry medium to large, scarlet, productive, but rather acid; it is better suited for market than for amateur purposes. Cloud's Seedling is very nearly a reproduction of Crescent, and is no better, if as good.

Warfield has been praised without stint, and declared to be the best of all. Grown in stools, thinly, it was of fair size, slightly necked, calyx reflexed, bright, glossy crimson color, attractive and handsome. But grown in matted rows, it was small, ranking with Cloud and Crescent under like conditions. I confess to disappointment as to size, and another season's trial is necessary to determine whether to keep it longer or not. Miami is a large dark crimson berry, more flattened than elongated, fairly productive and a vigorous grower, with no remarkable qualities so far as observed. Pine-apple is the most rank and vigorous grower of all. Its dark green foliage is pleasant to look at, but its few large, long, deformed, light dull scarlet berries are a poor substitute for good strawberries. It seems to be more fruitful in matted rows than in stools. Gandy is a light berry, and is large, handsome and good. The plants are strong and stocky, but do not promise to yield abundantly. Crawford is another large handsome berry of good quality. In stools the growth of plants was satisfactory, but the matted row resulting from plants set last spring, presented a sorry contrast to the fall-set plants, not fifty feet distant. Like the Gandy, it appears to lack the elements of productiveness, but both are deserving of further trial.

The above ten varieties comprise the bed of fall-set plants mentioned in Garden and Forest last autumn. They gave the best results I ever had from fall-set plants. The plants were taken from matted rows resulting from spring-set plants, thus giving two tests of each variety under the two systems, with results decidedly in favor of the stools from fall-set plants, with the single exception of the Pine-apple, and that is too poor to be taken into the account.

Shaw is a large berry of the Sharpless type, and the few plants I had in fruit promised as well as that variety ever did, with fewer deformed berries. A further trial is necessary to fix its value. Beederwood promised well; it is fairly productive, with large handsome berries. I shall give it another season's trial. Bubach 132 is a scarlet berry of good size and perfect shape, but seems to melt down if kept over-night, and is therefore not a good market berry.

Great Pacific is a fine, vigorous grower, but in size of fruit, quality and productiveness it proved a most dismal failure. I shall let a few of the plants set last fall remain over for another season. Gipsey proved little better than Wilson, and is disappointing on my soil.

Saunders, on fall-set plants, is large, handsome and good, and is very promising. This, with Gandy and Crawford, forms a trio of large berries that promise to supersede the Sharpless. Another season will fix their status in the long list of new ones, and the prospect is good for their standing near the head. The best and most remarkable of the new varieties is Parker Earle. The plant is stocky, vigorous and immensely productive. The berries are medium to large. They will not compare in size with Sharpless, Gandy, Saunders, Bubach, etc., but they are of good shape, handsome, and of good flavor, calyx reflexed, seeds prominent, after the type of Boyden's 30. It sets twice as much fruit as it should, for it is, I think, impossible for any plant to fully develop and mature so many blossoms. It appears to have good keeping qualities. At the first picking I gathered a quart without moving out of my tracks, a thing I never remember to have done before. Shuster's Gem and Lovett's Early were set later in the fall, and no fair estimate can be made; so far they show no remarkable features. Davis' Numbers Ten, Twenty and Twenty-five are vigorous growers, producing large handsome fruit, but the quality is inferior. Of nearly a dozen other new varieties not any, thus far, give promise of becoming standard sorts. Out of thirty new varieties fruiting this season, many of which cost one and two dollars a dozen, only about one-third seem to be worthy of further trial, and probably not more than half of that number will be regarded as standard sorts five years hence.

Among the older tested varieties the Pearl stands at the head with me. It is early, handsome, large, perfect in shape, has a reflexed calyx, is productive and very good in quality. It possesses more points of excellence than any other variety I know of. Next to Pearl is Bubach, altogether a different type of berry, much larger, very productive, but not as good in quality. Jessie is better in quality, but not as large as Bubach, and often ripens unevenly. It was better in this respect this season than ever before. Belmont nearly equals the Sharpless in size and is of better form, but does not produce as heavily. Jersey Queen has many friends; it is a late, large, handsome berry. With good care it will please those who like a rich acid berry. Jewell is a beautiful berry, but is too uncertain. It is very much given to blight here, from which all varieties have been exceptionally free this season.

Some large growers around Newark grow the Downing and Champion almost exclusively. About Irvington and Hilton the Great American takes the lead. Having found a berry which satisfies the requirements of their soils, the growers are content to let well enough alone; but should these varieties fail, as they may in time, they will be compelled, as I have been, to try other varieties, until they find suitable ones to take their places.

The best variety must be a matter for each grower to determine for himself, and when it is found it should be treated generously and grown as long as it continues to do well. The experiments here recorded are by no means conclusive, and allowance must be made for the soil, season, etc. The soil was a light clay loam, and the results would, no doubt, be different on a sandy loam or a heavy clay soil. Many of the varieties which are nearly worthless with me may prove of value under different conditions. Of course, it is unfair to condemn any variety for its behavior in one soil. Under different circumstances it may be good enough to fulfill the anticipations of its originator, although it must be confessed that these hopes are often more rosy than any experience will justify.

Montclair, N. J. *E. Williams.*

Stray Notes from the Arnold Arboretum.—VI.

Syringa pubescens (see Garden and Forest, vol. i., p. 415) flowers with the common Lilac. It is a slender upright-growing shrub with dark green ovate leaves, which are much smaller than those of the other cultivated Lilacs. The corolla of the flower consists of a narrow limb, with very short oblong lobes and a long slender tube; it is rose-colored at first, but turns pale or almost white before fading. The clusters of flowers, which are exceedingly fragrant, are small as compared with those of other Lilacs, but they are produced in the greatest profusion, and quite cover the branches of well-established plants. This species has never flowered as freely or produced such a charming effect as it did during the past spring; and there is now every reason to believe that it will prove a first-class plant, particularly useful for the decoration of small gardens, in which the other Lilacs might occupy too much space. The seeds from which the principal supply of the plants raised in the Arboretum were derived were sent here in 1882 by Dr. Bretschneider, at that time medical attaché to the Russian legation at St. Petersburg, to whom the Arboretum is indebted for the number of valuable and interesting plants. Living plants were received about the same time from the Arboretum Segretzianum, in France, and later it has been sent from other European gardens usually under the name of *S. villosa*, a very different plant, and a more valuable one, perhaps, from a decorative point of view, as it flowers several weeks after the common Lilac, or about the middle of June—that is, at the time when many shrubs have passed their flowering period.

S. villosa (see Garden and Forest, vol. i., p. 521) is also a native of northern China and is one of the plants sent by Dr. Bretschneider, and, like the last-described species, promises to be a real acquisition to American gardens. It comes from northern China and seems identical with the Syringa of the Himalayas, *S. Emodi*, and with *S. Josikæa*, of whose native country a good deal was said in a recent issue of Garden and Forest. This, however, is a question which need not be discussed in this connection, and it is sufficient to say that the plant grown here as *S. Emodi*, when it does flower, produces panicles which are smaller and much less beautiful than those of the north China plant; and that *S. Josikæa*, which flowers a week or perhaps ten days later, is in every respect less beautiful and desirable. The

seedlings of *S. villosa*, raised in the Arboretum, show a decided tendency to vary in the time of flowering, in the size and shape of the leaves, and in the size of the inflorescence—an indication, perhaps, that this species will respond readily to efforts made to improve it by selection. The best form here, and the last one to flower, has large, rather light green, ovate-lanceolate leaves, great broad terminal panicles which stand up on long stems above the plant and produce a remarkably attractive appearance. The flowers are individually large, with a rather short corolla-tube and short, ovate lobes; they are of a delicate flesh-color, shading into rose, and quite unlike, in color, those of any other Lilac. *S. villosa* is perfectly hardy and a vigorous grower, promising to attain, ultimately, a large size, the best plants here being now about eight feet high and eight or ten feet across the branches. It differs from the common Lilac in that the terminal bud develops, so that the inflorescence is terminal, three clusters of flowers being sometimes produced on the end of the branch instead of the two lateral ones of that species, which very rarely perfects its terminal buds. The flowers of the Chinese plant emit a strong and disagreeable Privet-like odor. In spite of this serious defect, however, many persons believe that this is the most valuable of the Lilacs recently brought into our gardens.

And this brings us to an entirely different section of the genus, the Ligustrinas, which botanists unite with Syringa, although they are distinct in habit and general appearance, and easily to be distinguished by their creamy white flowers, with a very short corolla-tube, barely exceeding the calyx in length. There are three of these plants now in cultivation. The best-known and the first to flower, the flowers appearing with those of *S. villosa*, is *S. Amurensis*, whose native country is explained in its specific name. It has been cultivated for a number of years, and is a bold, strong-growing shrub of irregular outline, with rather rigid branches and large, leathery, ovate-pointed leaves. The flowers are produced in short clusters

Fig. 60.—Iris Robinsoniana.—See page 352.

as broad as long, often inclined to be one-sided, and carried well above the plant on the ends of the principal stems. Here it is not a very free-blooming plant, but the clusters of flowers are large and make a great show in contrast with the dark green of the leaves below them. It is, however, less beautiful than its near relative, *S. Pekinensis* (see Garden and Forest, vol. iii., p. 165), which flowered here last year for the first time in cultivation from seeds sent to the Arboretum by Dr. Bretschneider. The flower-clusters produced last year were few in number and small in size, and gave little idea of the value of the species as a flowering plant. This year the plants flowered profusely about the middle of June, producing flower-clusters more than eighteen inches long, and were objects of unusual beauty and interest. The value of this plant, which seems destined to become a first-rate addition to the list of our hardy shrubs, is greatly increased by the graceful habit of its long, slender, arching stems, which now form masses some fifteen feet through and ten or twelve feet high. The foliage is peculiarly light and graceful, of a pleasing color and of late duration, although it does not assume a brilliant coloring before falling in the autumn. Altogether, *S. Pekinensis* is a more desirable plant than it was at one time supposed to be. It is well suited to stand by itself as an individual specimen on the lawn, where it can find plenty of room in which to develop its beauty of outline. It appears to require deep, rather moist, very rich soil, in which it grows rapidly; the plants do not flower until they are large and well established.

In 1878 the late W. S. Clarke, who organized the Massachusetts Agricultural College and then went to Japan, at the invitation of the Government of that country, to establish an agricultural college there on the American plan, sent a number of seeds, gathered in the neighborhood of Sapparo, in the northern island, to the Arboretum. Among them was a packet marked *Oleaceæ*. The seeds germinated, grew rapidly, and the plants proved, when they flowered, ten years later, to be the little-known *S. Japonica* (see Garden and Forest, vol. ii., pp. 293–295), which, like *S. Pekinensis*, the Arboretum first introduced into cultivation. So much has been said of this plant during the last two or three years that there is little left to say about it, except that it improves with age, producing, each year, larger and more abundant flower-clusters. It is absolutely hardy; it grows with great rapidity in good soil and is, in every way, an attractive and handsome plant of perfect habit; the foliage is ample and splendid; the inflorescence is not surpassed in conspicuousness by that of any other hardy tree. Rose-bugs take kindly to the flowers, but the leaves are as yet uninjured by any insect, and the only drawback to it is found in the fact that it loses its foliage early in the autumn, and that it falls without having first changed color. The fact that this plant flowers in July adds to its value as an ornament to the garden.

Arnold Arboretum. *P. C.*

Some Native Plants.

With the month of July many interesting species of the composite family commence to bloom. This number increases, until by the middle or last of August this natural order predominates among our wild flowers. It is a large and interesting family, represented in North America by 239 genera and upward of 2,000 species and varieties. The largest genus is the Aster, which contains 124 species. Many of these Asters are very handsome when in flower, and form a large share of the last wild flowers of the season. The next genus in size is the Solidago (Golden-rod), for which America is noted, and of which we have over a hundred species and varieties. Both genera are, for the most part, among the later-flowering plants, but the Golden-rods are the earlier of the two. Many of the Asters are quite late, some continuing to bloom until killed down by frost. As a rule, Golden-rods and Asters transplant well into any ordinary soil, and if they are cut back half or two-thirds their length, lifted with care, and not allowed to become dry before setting, there is no better time for this, all things considered, than when they are in flower. They need to be watered and cared for until established.

Lepachys pinnata, now in flower, is a showy composite, with flowers three or four inches wide, bright yellow, with a grayish centre. The rays are somewhat drooping, as in *Echinacea purpurea*. It is a slender plant, three or four feet high, each of the numerous branches terminating in a single flower. A dry sunny exposure seems to be its choice, and any ordinary garden-soil will suit it. The peculiar drooping habit of its petals, and the size of the flowers, which are on ample stems, suggest its value for cutting. Frequently blooming with it is *Heliopsis scabra* (the Ox-eye), a plant with darker golden, showy flowers not quite as large as those of *Lepachys pinnata*.

Another composite, conspicuous for its profusion of bloom at this season, is *Chrysopsis villosa*, the Golden Aster; it is a shorter plant and more spreading in habit, and is common on dry soil and along gravelly railroad banks. The golden-yellow flowers of this plant are an inch or more wide, and quite attractive. Still another striking species of this family, now beginning to flower, is *Vernonia Baldwinii*, the first of the Iron weeds to bloom. The large cymes of deep purple flowers are a pleasing change from the yellow of the three genera above mentioned, and which, as the season closes, is sometimes so universal as to become tiresome.

Scutellaria canescens, one of the Skullcaps, which blooms about the middle of July, is a hardy and interesting perennial three or four feet high, with leafy stalks, terminating in a good-sized racemed panicle of showy blue flowers. A sunny exposure and ordinary soil will suit it.

Verbena Aubletia, one of the Vervains, has been in flower for more than a month. It is a slender species, the spreading, almost procumbent, stems of which terminate in thickened spikes of showy reddish purple flowers. An inhabitant of open woods or prairies, it thrives in any common soil, in the sun or partial shade. Its near relative, *V. stricta*, the Hoary Vervain, is a taller plant, with clustered spikes of pretty purple flowers.

The genus Verbascum (Mullen) is a large one, embracing nearly a hundred species, which are natives of Europe, northern Africa and Asia. Most of these are biennials. We have four species in North America, all of which, I believe, have been introduced. *Verbascum nigrum*, the Dark Mullen, which is native to Britain, Europe and western Asia, is said to be a perennial. Its normal height is only three or four feet, but, under favorable circumstances, it attains a height of six feet and more. Its long spike, or spikes, of bright canary-yellow flowers are very handsome, and continue for a long season. It is a stately and striking plant, which seems to be quite hardy, and easily managed.

Botanical Garden, St. Louis, Mo. *F. H. H.*

Annuals New and Old.

Calendula suffruticosa is a neat growing plant, some eighteen inches high, and very free blooming. The flowers are single, about two inches in diameter, golden yellow, with narrow petals, Doronicum-like in form. This variety is useful for a quiet yellow effect in the garden. The flowers close in dull weather, and are probably not of much service for bouquets.

Centaurea Cyana nana compacta "Victoria" is a long name for a very small plant. This Cornflower forms rounded little plants only six inches high, covered with small blue flowers, resembling, in form and color, the ordinary Kaiserblumé. It does not seem to have a long season of bloom, and may be added to the long list of curiosities.

Zinnia Haageana pumila floro pleno is another accession to the list of dwarf plants to which florists will be sure to give attention. This little Zinnia forms a much-branched bush, about a foot high; it blooms profusely with semi-double flowers about one and a half inches in diameter, of a rather dull orange shade. If some good bright Zinnia colors could be infused into this strain it would be very useful in many places where the larger variety would occupy too much space. There is no sentiment about the Zinnias, but they have wonderfully bright clear colors, are very lasting, and there are, perhaps, no plants which give a more dazzling effect for so little expense and labor.

The double *Chrysanthemum coronarium imbricatum* strikes me as a curious example of the vagaries of the seed trade. *C. coronarium* is one of the commonest of annuals, with rather soft foliage, but with good double yellow or yellow and white flowers. It seems to have occurred to the florists a few years ago that it was a very good thing, and now small plants are largely sold in the spring sales, and the seedsmen have exercised their ingenuity in getting out slight variations. This year's offering differs from the type only in that the petals, instead of being flat, are vaulted. The general effect of the flowers is the same, but the price, it is perhaps needless to say, has quintupled.

Carnation Margaret, half dwarf, is a selection from the quick-growing Carnations introduced last year by Dammann & Co., who also offer these in separate colors and a dwarf kind. Like the variety of last season, they are rapid growers, coming into bloom in five or six months under ordinary culture. The

flowers are of rather thin texture, but are fragrant, mostly double, and very satisfactory out-of-doors. The colors are white, red and yellow, and are selfs. Unlike most Carnations in a young state, they do not seem to be at all hardy. This strain is very slightly more dwarf than the first offering.

Torenia Fournieri is not a new annual, but it is worth noting as having proved very satisfactory out-of-doors, where it does not seem to be much used. It forms neat, sturdy little bushes, with somewhat ruddy stems. Its elegant violet and royal purple flowers always attract attention, and, as it blooms freely, it is useful as a front-row plant, where the color is desirable.

Gaillardia amblyodon is another annual too seldom seen. It has very attractive single flowers, about two inches in diameter, of a rich mahogany-red. It is one of the most distinct of annuals, the coloring being very rich and peculiar. The plants are about eighteen inches high, and should be grown in clumps.

Elizabeth, N. J. *J. N. Gerard.*

Iris Susiana.—Plants that are fickle in their behavior or that stubbornly refuse to comply with the wishes of growers have a peculiar fascination for determined gardeners, and among such are *Iris Susiana* and *I. Robinsoniana*. The latter plant has been grown in this country a number of years, but, so far as I know, it has not yet been flowered. At the Harvard Botanic Garden it has been tried out-of-doors and under glass, in rich soils and poor, in moist, dry and medium situations, in pots and borders, in shade and sunshine, and still no blossom, nor even a sign of one appears. It grows freely enough, forming vigorous and handsome specimens, but never a bloom.

Although rather eccentric, *I. Susiana* is much more tractable. It is a Levantine species, originally found in Persia, and has been cultivated in western Europe since 1573. It was cultivated in England in the time of Gerard, for in his "Herbal," under the name of *I. Chalcedonica*, it is spoken of as "a rare and beautiful flower to behold." Parkinson, also, in his "Paradisus Terrestris," speaks of it as "The Great Turkey Flower-de-Luce." The specific name it now bears refers to an ancient city of Persia, and it was the French, I believe, who first gave it the common, and not inappropriate, name of "Mourning Iris." The plant attains a height of from one to two feet, the light green, ensiform leaves being a trifle shorter than the stem, at the top of which appears a single flower, magnificent in size and of weird aspect. Ordinary flowers measure six inches across by eight inches from base to apex, and I have often seen them larger. The ground color is a grayish lilac, indescribably lined, spotted and shaded with rich purple. I have had no experience with the plant in this country, but I know that precautions similar to those described by Mr. Gerard (page 273) are necessary to its successful management in British gardens. As Mr. Orpet recommends pot cultivation in a frame for these plants, I was prepared to consider them not hardy in Massachusetts until my neighbor, Mr. Thomas N. Cook, who manages a small villa garden with consummate skill, invited me to see one of these Irises in bloom on the 11th of June. Last October Mr. Cook secured a few roots of the plant, and, not having the protection of a cold frame or greenhouse, he set the roots ten inches deep in a mixture of sand and well-decomposed cow-manure. They occupied an exposed position ten yards away from the house and were slightly mulched with dry litter. The situation was neither particularly wet nor dry. The late winter was not unusually mild here, and people in eastern Massachusetts may therefore have a reasonable hope for success with this beautiful species, if Mr. Cook's method is adopted.

Cypripedium Lawrenceanum.—This species has bloomed here for more than two months, and is, beyond question, the most decorative Cypripedium in cultivation. The oblong leaves are from six to twelve inches in length, and beautifully tessellated with greenish white and dark green, the colors being irregularly distributed in about equal quantity. The foliage excels that of all other Cypripediums in beauty, and the genus is one in which attractive leaves are not rare. The distinctness of the variegation would in itself be sufficient to commend the plant to the notice of growers. The flowers, measuring five inches from tip to tip of the petals, and four and a half inches from the base of the lip to the tip of the dorsal sepal, are borne singly, seldom in pairs, on a scape from twelve to eighteen inches long, erect, hirsute, and of a purplish color. The lower sepal is small, ovate-oblong, greenish, with dark lines, the upper one large, between two and three inches across, almost circular, white, with purple and bright rosy purple lines; petals ligulate, pale green, tipped green, with little black excrescences of roundish outline and numerous hairs along the margin; lip large, dull purple in front, and pale green behind. Sometimes the flowers retain their full form and color considerably over a month, and they have been kept two weeks in water. The plant succeeds best in a stove temperature.

There are now many excellent varieties recognized by the trade. Among the best of these are Atro-purpureum, Coloratum, Elegantissimum, Expansum, Hyeanum, Majus, Marmoratum and Superbum.

Botanical Gardens, Cambridge, Mass. *M. Barker.*

The Forest.

Its Significance as a National Resource.

UNDER the title of "What is Forestry?" the United States Department of Agriculture has published a bulletin prepared by Mr. B. E. Fernow, Chief of the Division of Forestry. Most of the subject-matter, it is stated in the letter of transmittal, has already been presented by Mr. Fernow in the form of public addresses before different bodies like State Boards of Agriculture and the Chamber of Commerce in Rochester, New York, and the interest shown in it suggested the desirability of publishing it to a larger audience. The subjects of forest-management, that is, forestry in a wooded country, and forest-planting, or forestry for the treeless plains, are both considered in this bulletin. In treating of the first of these general subjects much practical information is given on reproduction, on thinning, on undergrowth, on the influence of light, and other matters of detail in the actual practice of the art of forestry, and, besides this, there is a discussion on the profitableness of forest-management, together with some notes on European government forestry and on working plans for large forest-areas and the needs of a well-organized administration. All that is set forth on this part of the subject has been derived from experience, and it is a valuable résumé of the most important points in recognized forest-practice. Of course, it is not assumed that what is proper management in one country is proper in all others, and Mr. Fernow lays down the qualifying proposition, which should be borne in mind by every one who takes an interest in the forests of the country, as follows: "Before we may apply the finer methods of forest-management as practiced abroad, it will be well to begin with common-sense management, which consists in avoiding unnecessary waste, in protecting against fire, in keeping out cattle where young growth is to be fostered, and in not preventing by malpractice natural reforestation."

Under the head of forest-planting, Mr. Fernow speaks of the necessity of co-operation. He gives a list of such trees as are more liable to succeed, together with some directions how to mix them, and adds some notes on the proper methods of planting. This subject of tree-culture on the western plains is also illustrated by two letters from correspondents, who give their experience in tree-planting on the prairies of Dakota, and this record of personal effort is an instructive commentary upon the suggestions of the bulletin. The whole makes a pamphlet of rather more than fifty pages. We quote a portion of the introductory paragraphs, which are found under the title of "The Forest and Its Significance":

The forest primeval is our most valuable inheritance. It is the ready cash of nature's bountiful provision for our future. Of all the natural resources reserved for our use it is the most directly useful, for in the forest we find ready to hand, without further exertion than the mere harvesting, the greatest variety of material applicable to the needs of man, the means to satisfy every direct want of life. The accumulations of centuries are stored in the tree-growth of the virgin forest and in the forest-floor of decayed foliage. Nature has taken no account of time or space, both of which were lavishly at her command; nor did she care whether the forest was composed of the timbers most useful to man; tree-growth, whatever the kind, satisfied her laws of development.

But when man begins to occupy the ground, when a growing nation has need of the soil for agricultural use and for timber, when the forest gives way to the field and meadow, it becomes necessary in time to introduce economy into the use

of our inheritance, to relegate the forest to the non-agricultural soils, and to make the soil do full duty in producing only that which is useful to man.

Then a new conception of the forest arises. The "forest primeval," together with the young natural growth of the better class, becomes "woodlands"; the brush-lands, which result from the careless treatment of the original growth, become "waste lands," and the name of "forest" is reserved to those woodlands, which have become objects of human care, producing to the fullest capacity of the soil the most useful material. No more convincing argument for the importance of this resource in a nation's economy can be offered than to state the value of the forest-product in the United States.

The total annual product of wood-material of all sorts consumed in the United States may be valued in round numbers at $1,000,000,000, representing, roughly speaking, 25,000,000,000 cubic feet of wood, or the annual increase of the wood-growth of 500,000,000 acres of forest in fair condition. This value exceeds ten times the value of our gold and silver output, and three times the annual product of all our mineral and coal mines put together. It is three times the value of our wheat crop; and, with all the toil and risk which our agricultural crops involve, they can barely quadruple the value of this product yielded by nature for the mere harvesting. If to the value of our total mining product be added the value of stone quarries and petroleum, and this sum be increased by the estimated value of all the steamboats, sailing vessels, canal-boats, flatboats and barges plying in American waters and belonging to citizens of the United States, it will still be less than the value of the forest-product by a sum sufficient to purchase, at cost of construction, all the canals, buy up at par all the stock of the telegraph companies, pay their bonded debts, and construct and equip all the telephone lines. The value of the annual forest-product exceeds the gross income of all the railroad and transportation companies. It would suffice to pay the indebtedness of all the states, if we leave out New York and Pennsylvania, including that of all counties, townships, school districts, and cities within those states (in 1880); and it would more than wipe out the remaining public debt of the United States. In fact, ranking manufactures of all kinds and agriculture as respectively first and second in importance, as far as production of values goes, the forest-product occupies the third place. This was the case according to the census of 1880. It is claimed that since then the lumber industry has enlarged to such an extent as to make its product second, if not first in value.

Not only does the forest furnish the material for the construction of dwellings and other structures, our railroad consumption of 500,000,000 cubic feet of timber included, but it yields to two-thirds of our population the fuel to warm their houses and to prepare their food; it gave us the first means of using our mineral resources, and even now 600,000 tons of our iron product depend upon charcoal. Not only does the wood in its natural form serve our needs, but our ingenuity has invented methods by which we can transform it into cellulose, paper, and even silk, while lately it has become possible to prepare from the brushwood a feed for cattle more nutritious than straw and equal to hay. By distillation of the wood numerous new products are derived from it, like alcohol, acetic acid, gas, vanillin, etc.; the bark yields indispensable tanning material. Resin and tar to pitch our vessels, and turpentine, sassafras oil, and quinine to cure our ills, rubber and cork for a great variety of uses, maple sugar and cinnamon to flavor our food, all are derived from the forest; an enumeration of the use of forest-products would be almost endless.

While this direct usefulness of the forest is patent to every one, there are to be noted some more hidden indirect phases of utililty as important as those which are presented by its material. The forest, with its decaying vegetation, has furnished the fertility of our fields and waters, for the mineral soil without the humus or vegetable-mold would never have produced food enough for mankind.

Another incalculable benefit of the forest-cover is the part which it plays in the great economy of nature, the recognition of which led Humboldt to exclaim: "How foolish do men appear, destroying the forest-cover without regard to consequences, for thereby they rob themselves of wood and water."

It is only within a century or so that the value of a forest-cover as a protection against destructive natural forces and as a regulator of favorable cultural conditions, by its influence upon climatic conditions and upon the flow of water, has been recognized and proved. Whatever may in general remain unexplained in regard to these influences of the forest, it is well established by observation, experience and experiment that, under certain conditions of soil, topography and climate, these influences not only exist, but are of considerable importance in preventing the washing and shifting of the soil, regulating the surface and subterranean drainage of waters, breaking the force of and tempering hot and cold winds, and thus acting as a regulator of cultural conditions.

The significance, then, of the forest is twofold. For the private interest it is, in the first place, only a source of profitable products; for the interest of the community, the state, or nation it forms an indispensable basis of material prosperity, directly and indirectly. Forest-management, therefore, including a proper maintenance of forest-cover where desirable, supplies not only profitable employment for private enterprise, but is also an important factor of public economy, and the application of proper forestry-principles is hence a matter of the highest public interest.

Correspondence.

Our Neglected Native Flowers.

To the Editor of Garden and Forest:

Sir,—It is a fact to be regretted that the value of plants is so commonly rated by the remoteness of the country from which they have been brought. The cold inhospitable regions of Siberia and Kamtchatka, the torrid jungles of Africa, the wilds of Australia, the distant Indias, the treeless Brazilian Pampas, and the forests of the Amazon are eagerly searched for floral treasures, while our native plants, such as Laurels, Magnolias, Andromedas, Rhododendrons, Lilies, Irises, Cypripediums, Cacti, Phloxes, Passion Flower, Verbenas, Calycanthus, Trailing Arbutus, Calamus and Pond-lilies are comparatively neglected.

A few persons are beginning to appreciate this class of plants, but our people generally are willfully blind to their beauty. In my own little backwoods corner of the south-west we have *Clematis coccinea*, *Ipomea pandurata*, *Bignonia radicans* and Virginia Creeper among vines, Cornels, Red-bud, Hydrangea and Viburnums among shrubs, Phloxes, Lobelias, Penstemons, Verbenas, Ageratums, Aquilegias and other herbaceous plants, all growing wild. One of my neighbors once lamented the poverty that had kept her yard bare of flowers for fifteen years. When I suggested that her boys could get her a great many flowers in the woods a quarter of a mile away, she drew herself up with sudden dignity and freezingly remarked, "that she supposed she could if she wanted *wild* flowers, but she didn't." The sarcastic emphasis on that word "wild" showed that she considered the suggestion a positive insult. Again, while traveling in Arkansas, we passed a grove of beautiful trees, which were then unknown to us. Meeting a family group a little later, we asked the name of "those grand trees, remarkably handsome," we told them, "tall and straight, with corky bark and curious five-pointed leaves, shining as though varnished." But the more we explained, the more puzzled the party became. At last an old lady recognized the description, and burst out with, "La sakes! stranger, them aint nuthin' but Sweet Gums! The men thought yer meant sumthin' fine." "Sumthin' fine" meant something they could not see every day, and it seems to mean this with most people.

Nor is the contempt of wild things confined to the uneducated classes. A certain academy town, whose citizens pride themselves on their culture, has several amateurs ambitious of being considered connoisseurs of choice and rare flowers. Twenty years ago, within a radius of two miles of this village, one could find *Lilium Canadense*, *Cypripedium spectabile* and *C. pubescens*, Gaultheria, *Sarracenia purpurea* and *Trillium grandiflorum*. A choicer or more distinctive half-dozen plants could hardly be named. To-day not one of these plants can be found in that neighborhood, and it is but a question of time when the Cardinal-flowers and Lobelias, the Phloxes and the Hepaticas will also be extinct there. In this same town a lady once received a gift of a rare hybrid Azalea. The premises included a river-bank, and here the precious treasure was planted, and watched until it was a thrifty, good-sized specimen that each year gave large clusters of rich scarlet blossoms. In time a new owner changed the boundary-fences, and this bank was thrown outside of the enclosure. The river-side soon became the promenade-ground of the town, and though the beautiful Azalea was quite conspicuous, it was supposed to be indigenous, and so was unprotected and uncared for. Lovers sat beside it and picked its leaves and blossoms to pieces as they talked; stray cattle ate it down, until but dwarfed shoots remained; baby-buggies were trundled over it, and people stepped on it in their haste to witness a boat-race or a baptizing. A few years after, one who knew of this rare shrub

came from a distant state after it, and found it gone, root and branch, not even a stump remaining to show where it had once stood. How the amateurs of that town would have rivaled each other in their eagerness to secure a root or sprout of it had any one told them what a rare exotic it was. But, with all its exquisite beauty, it perished because people thought it a native plant, and would not take the trouble to transplant it where it could have liberty to grow unmolested.

The study of botany in our common schools and the organizing of wild-flower clubs would tend to popularize our home-plants and to demonstrate that there is as much genuine beauty in the daintily-poised Blue-bell of the meadow as in the more pretentious cultivated flower, and that a fine flower is beautiful wherever found, be it in greenhouse, door-yard or woodland. It would be easy to interest our children in collecting native plants and in having them care for them in the home grounds, and there is as much pleasure and recreation in a day of plant-gathering as in hunting or fishing.

I have noticed that a few persons lead the floral taste of each town, and that every successful flower-garden has many imitators, and if persons who appreciate wild flowers would give them a place in the garden for their own pleasure, they would soon find the little floral world around them growing the same kind of plants. If, in the neighborhood summer-outings plant-collecting trips were included, beds of native flowers would soon be as much a feature of the garden as the ribbon, foliage or sub-tropical beds now are.

Among the encouraging signs to be noted is the prominent position which Garden and Forest and other good journals give to articles on native plants and flowers, and the increasing number of advertisements, which show that the propagation and sale of native plants is receiving more attention.

Pineville, Mo. *Lora S. La Mance.*

A Redeemed Swamp.

To the Editor of Garden and Forest:

Sir,—In an editorial article in Garden and Forest, for July 8th, on the Value of Rural Beauty, the encouraging fact was noted that there is an increasing tendency to purchase so-called waste places and to hold them for the enjoyment of the people. This is, without doubt, true, and few of us whose travels are confined to main thoroughfares realize how much is being done in this direction. The workers are immersed in their creditable work and seek no notoriety, and their efforts seldom find a recorder. A very interesting public improvement, carried on by private enterprise, I found a few days since in the near-by town of Clifton, New Jersey. Along the Dundee Drive, at the foot of Dundee Lake, a reservoir on the Passaic River, there was a swamp stretching for a thousand feet along the road. The swamp occupied a depression between the drive on one side and a sloping hill on the other, and like the usual waste place of this character, was an eyesore, filled with weeds, wild grasses and decaying vegetation, and covered in summer with a pall of dust. Mr. S. C. Nash, who occupies a residence opposite, acquired the property, and with energy inspired by a love of nature in general and aquatics in particular, has widened the swamp into a small lake, waged war on the unsightly vegetation, started a garden of native plants on the border, established the hardy Water Lilies, and has already effected a transformation which promises the town a never-failing attraction.

Mr. Nash has not redeemed this place without a constant struggle with uncompromising and sleepless enemies, and he reads Mrs. Robbins' account of renewing an old place with a sympathy which comes from similar trials and experiences.

The Nymphæas, Pontederias, Irises, Wild Rice, Sagittarias, and the like, have already taken hold with vigor, but to one only accustomed to growing aquatics in an artificial pond it was interesting to note the numerous indigenous wildings exactly adapted to their environments, which grew apparently for the delight of rebellion against constant efforts to exterminate them. But Mr. Nash will learn, as many of the rest of us have already learned, that these trials are the true sources of delight in the garden.

Elizabeth, N. J. *G.*

Are Fungicides Abused?

To the Editor of Garden and Forest:

Sir,—Under the head of "The Abuse of Insecticides," Dr. Hoskins, on page 247, protests against using mineral poisons as fungicides, and declares that he cannot consent to the use of arsenical sprays in his orchard either as an insecticide or fungicide. While not wishing to discuss the question of the danger of arsenical compounds, it seems only just to state that the accepted formulæ for fungicides do not call for any compound of arsenic. This does not mean that fungicides are harmless to man if taken into his system in considerable quantities. Many substances are used to prevent the growth of mildews, molds and blights, but usually they contain some compound of copper as the effective ingredient, which is not wholesome, although lacking much of the poisonous nature of the arsenical insecticides. That these copper compounds can be used as a spray in such large quantities as to do injury to the person afterward using the treated fruit or vegetable for food is possible, but the experience of many, extending over several years, indicates that the chances of harm are too few to be worth considering. In other words, the standard fungicides, when properly applied, are practically harmless. Their effectiveness is now generally admitted. Thousands of Grape-growers, for example, now spray their vines with as much faith in the process as they have in the value of manures for crops. Again, it has been shown that the copper mixture will save the foliage of Pear-trees from the leaf-blight, and bring a prize crop of fruit when only leafless and fruitless branches would remain if the fungicide was withheld. Practice has demonstrated that fungicides pay. It would be unfortunate if fruit-growers or gardeners should be deterred from using them by an imaginary danger.

N. J. Experiment Station. *Byron D. Halsted.*

Exhibitions.

The free Saturday exhibitions of the Massachusetts Horticultural Society can generally be depended upon to bring together some interesting plants and flowers, and are often more instructive than the more elaborate exhibitions given by this society at stated periods during the year. That which was held on the 19th of July may be called a Hollyhock exhibition, as the principal prizes awarded were given to this popular flower. Mr. Joseph S. Fay, of Woods Holl, who in the last year or two has come into the very front rank of exhibitors before the Massachusetts Society, easily took the first prize, both for cut flowers and for a collection of spikes, which were nearly six feet high, and proportionately strong and vigorous. Flowers almost as fine were exhibited by Mr. Nathaniel P. Kidder, of Milton, who took the second prize. Very interesting and beautiful was a remarkable collection of Sweet Peas sent by the Reverend W. T. Hutchins, of Ellington, Connecticut, comprising forty-four varieties, in many colors, some exceptionally dark. It contained many of Mr. Hutchins' own seedlings, and, altogether, was one of the most attractive exhibits which has been seen in Boston for a long time. A collection of the Shirley Poppies, from F. S. Davis, attracted considerable attention. These are charming flowers of the most delicate and delightful shades of color, but it cannot be denied that they possess the disagreeable odor of their race, and that, like all Poppies, they last a very short time. Mr. Benjamin B. Smith, of Cambridge, showed a basket of the large fruit of a dwarf Shad-bush (*Amelanchier Canadensis*, var. *oblongifolia*), to the cultivation of which he has for several years devoted careful attention. This, on the whole, is the most promising of all our wild fruits, with the exception, of course, of that of some species of Vaccinium and Gaylussacia, and only requires time to develop it into a first-class table berry, although it must not be called a berry, being really a little apple, or something very much like it. Very fine Versailles Currants were shown by William Doran & Sons and by B. G. Smith. The first prize for White Currants was awarded for White Grace, and the second for Dana's Transparent. An unusual and most remarkable collection of peas appeared on the table devoted to vegetables, the first prize being awarded for Stratagem, the second for Telephone, and the third for the Duke of Albany. This last, a new variety, was sent from the gardens of Mr. D. B. Fearing, of Newport. The dish of Stratagem, in size and in perfection of pod and seeds, eclipsed anything which has been seen in Boston for a long time.

Notes.

In Mrs. Scidmore's recently published "Jinrikisha Days in Japan" she hints at the fact that landscape-gardening is practiced by amateurs and even by ladies, saying that the Countess Okuma designed the "paradise of a garden" which surrounded her husband's town residence, now the home of the French legation.

Paris is probably the only northern city where brides may obtain Orange-blossoms at all seasons of the year. When they

are in bloom in the south they are, of course, imported, but at other times the greenhouses of the city and its vicinity furnish an uninterrupted supply; and it is said that the forced flowers are superior to those brought from the south, as the latter soon turn gray and dingy when exposed to the air.

It has been claimed by many growers of Roses that the temperature of the water applied to them is a matter of no consequence, but in the last number of the *American Florist* Mr. John N. May considers it an important point that the water should be tepid. Hydrant water in winter he thinks much too cold to be applied to the plants. In the summer, water which is supplied to towns, however, is not often much below sixty degrees, and therefore will do no injury.

One of the oldest wooden stairways that exist is the flight which leads up to the gallery of the Sainte Chapelle, in Paris, on the north side of the shrine, its companion on the southern side being a restoration. It was built during the first half of the thirteenth century, when Saint Louis erected the chapel to contain the Crown of Thorns, now preserved at Notre Dame. It is very delicately carved, and is regarded as a masterpiece of the finest period of Gothic art. The stairs wind about a central newel and are supported on the outer side by uprights, which form an open-work cage.

The following advertisement is one of a large class which appeal, we fear with some success, to a puerile craze for novelty on the part of persons who think that they "love plants"; but it is the first we remember to have seen where an appeal is likewise made to a pseudo-religious sentimentality. Singularly enough, it was allowed to appear in an English journal called *The Christian*, for it runs: "Wonderful Symbolical Plant—Calvary Clover, leaves three in one, with blood-like spot, seed-vessels surrounded with mimic crown of thorns. Grows freely in pot or open ground. Healthy plants, two for one shilling."

Every one knows that "elbow grease" is the best polish for mahogany, and it is interesting to learn how it is applied in Japan to produce the beautifully polished floors of cheaper wood, upon which one is not allowed to tread with shoes. "They are not varnished, nor oiled, nor waxed," says a recent traveler, "but every morning rubbed with a cloth wrung out of hot bath-water, which contains oily matter enough to give, in time, this peculiar lustre. Three years of daily rubbing with a hot cloth are required to give a satisfactory result, and every subsequent year adds to the richness of tone and polish, until old tea-houses and temples disclose floors of common pine looking like rose-wood or six-century-old oak."

A correspondent sends us some spikes of bright pink flowers, and inquires what they are and why they are not often cultivated. They prove to be flowers of the Hardhack (*Spiræa tomentosa*), which ought to be familiar to all persons who have passed much time in the country at this season. This is among the latest of the Spiræas to bloom, and it is really one of those handsome plants which would be often found in private grounds but for the fact that it is native and common. It is usually found in low grounds, but not always, and it will thrive in any ordinary position. When planted in rich soil, and occasionally cut back, it makes a dense shrub, and the beauty of its flowers, as well as the season of its bloom, make it a very desirable plant.

At the last session of the Ontario Legislature an Act of Parliament was passed for protecting the plant Ginseng (*Aralia quinquefolia*), and the Honorable John Brydon, Minister of Agriculture, has thought it advisable to publish a bulletin, so that the people of Ontario may be better acquainted with a plant of so much economic value. The bulletin contains a figure of the plant, with both popular and botanical descriptions and notes on its distribution, which show that it is comparatively common throughout the province. Of course, it is used for export to China. Twenty thousand dollars' worth was shipped over the Kingston and Pembroke Railroad last year, and the price of dry roots ranged from $3 to $3.50 a pound. Whether it would pay to cultivate the plant is a question now considered. The law referred to forbids any one from rooting up, gathering or destroying Ginseng wherever it may be found in a wild or uncultivated state, except for the purpose of clearing land and bringing it under cultivation, between the first day of January and the first day of September in any year.

There may be some reality in the danger explained by a writer in the *New York Tribune* who recently described the butler in a large country house arranging the flowers with which the rooms were filled, renewing those in each receptacle with the greatest skill, but merely adding a little fresh water to that already polluted by the blossoms of the day before. "I knew by experience," says the commentator, "how fetid and offensive water becomes from decaying stems of plants, and I spoke to my friend on the subject, believing, as I did, that the standing water in so many open receptacles was positively unhealthy. 'How often do you clean the vases completely, James?' she inquired. 'We wash everything once a week, ma'am,' he answered respectfully; 'the rest of the time I only take out the flowers that are faded and replace them with fresh ones.' 'Just take out those," she directed, pointing to a big yellow bowl filled with purple Irises. As he lifted the wet mass from the dish the odor was so sickening that it filled the whole room. Now here, I thought, is surely a question for a physician, and yet I have never heard it mentioned. Wherever houses are profusely decorated with flowers, this stagnant water is presumably standing constantly in living-rooms, and people are continually breathing what, even out-of-doors, under the fresh winds of heaven, is generally accounted unhealthy."

In speaking of the planting of home grounds, Mr. Parsons, in his recently published *Landscape Gardening*, well says: "The tendency of those who think of trees in mass, and in their mass relations, is to crowd them too much with their companions, to fail to comprehend their appearance at maturity, and thus to develop their proper effect imperfectly. Such a tendency is apt to 'crib and confine' the trees and to undertake to make them do duty after a fashion that is not altogether adapted to their nature. . . . On the other hand, a person who dwells specially on the development of the individual character of a plant is liable to err in another way, and to sacrifice the broad effects and harmoniously combined relations of trees to the exhibition of characteristic and highly perfected individual excellences. . . . A middle way of arrangement may be pursued, with reasonable satisfaction, which will secure good mass effects and a fair consideration for the character of individual specimens. . . . Outlying specimens of choice trees and shrubs will vary the outline of the masses here and there, and, perhaps, stand alone at a few points without shrubs. . . . A simple negative rule for the arrangement of trees, shrubs and herbaceous plants is never to plant them in a continuous straight line, but in groups with curving boundaries, and placed on the specially prepared crests of swelling spots or portions of the lawn."

A recent writer in the *Cornhill Magazine*, speaking of "elastic fruits" which explode when their seeds are ready to be scattered, says that the examples of these elastic capsules produced in the tropics, where plants have to fight against a greater multitude of powerful enemies than in temperate regions, "are by no means mere toys to be lightly played with by babes and sucklings. The Sand-box tree of the West Indies has large, round fruits, containing seeds about as big as an English horse-bean, and the capsule explodes, when ripe, with a detonation like a pistol, scattering its contents with as much violence as a shot from an air-gun. It is dangerous to go too near these natural batteries during the shooting season. A blow in the eye from one would blind a man instantly. I well remember the very first night I spent in my own house in Jamaica, where I went to live shortly after the repression of 'Governor Eyre's rebellion,' as everybody calls it locally. All night long I heard somebody, as I thought, practicing with a revolver in my own back garden—a sound which somewhat alarmed me under those very unstable social conditions. An earthquake about midnight, it is true, diverted my attention temporarily from the recurring shots, but didn't produce the slightest effect upon the supposed rebel's devotion to the improvement of his marksmanship. When morning dawned, however, I found it was only a Sand-box tree, and that the shots were nothing more than the explosions of the capsules."

Catalogues Received.

A. Blanc, 314 N. 11th St., Philadelphia, Pa.; New Floral Electrotypes.—William Bull, 536 King's Road, Chelsea, London, S. W., England; New and Rare Plants and Orchids.—Ellwanger & Barry, Mount Hope Nurseries, Rochester, N. Y.; Pot-grown and Layer Strawberries, Bulbous Flower Roots for Fall Planting.—W. B. Hartland, Cork, Ireland; Carefully drawn Illustrations of nearly fifty varieties of Daffodils.—J. L. Normand, Marksville, La.; Rare Oriental Plum Buds.—J. J. van Loghern, Haarlem, Holland, Otto Schmitz, Fuller Building, Jersey City, N.J., Ag't; Wholesale Price List of Dutch Bulbs.—Van Velsen Bros., Haarlem, Holland; Flower Bulbs.—James Veitch & Sons, 544 King's Road, Chelsea, England; Catalogue of Plants, including Novelties for 1891.

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An Object-lesson in Road-building.

THE trustees of Cornell University at their recent meeting took action which promises to give important assistance to the movement for reform in the construction and care of country roads. Whenever a community is urged to mend its highways, the usual response is the inquiry, What kind of roads shall we build? This is a simple and pertinent question, but in most cases it is a difficult one to answer. The subject of road-construction is not so thoroughly and generally understood that it is an easy matter for the intelligent people of any community to say what form of road-bed would best suit the conditions of the country and the capabilities of the tax-payers. There are whole counties in the rural districts which do not contain a single engineer who is competent to give professional advice on a matter of this sort, and there are hundreds of square miles which do not contain a single rod of roadway which can be used as an example of good and economical construction. It is, therefore, a matter of prime importance to multiply examples of good roads, so that their advantages can be appreciated and their construction understood.

Now, the action of the trustees of Cornell University is particularly encouraging, in that it does propose to furnish the necessary object-lessons for studying the practical benefits of the best available roads, and to offer accurate explanations of the methods used. It was on motion of President Andrew D. White that a resolution was adopted directing the Professor of Civil Engineering, the Professor of Agriculture, and the Professor of Horticulture in the university to prepare a plan for putting the roads in the university property into the best possible condition. These officers are instructed to use the material which shall be most suitable and economical, preferably such as can be obtained in the neighborhood of the university, and that the project shall be carried out with a view to secure thoroughness and permanence, and, at the same time, with the strictest regard to economic construction. The committee is to prepare estimates of the cost of various methods of road-building and improvement, and they are advised that it is the opinion of the board that the different roads should not be all constructed on one plan, but upon the different systems, which experience elsewhere has proved to be worthy of a trial. It is, of course, understood that a careful account shall be kept, not only of the cost of constructing these various roads, but of maintaining them. It is further ordered that, when any road shall have been completed, an inscription shall be set up near it, at some point within public view, giving in detail, for the information of the public the cost of a mile of such a road. At a later period a statement shall be added as to the average cost of its maintenance by the mile every year.

In more than one of our agricultural colleges courses of lectures are already given on road-construction, and it is certainly important that these institutions, which are founded by the bounty of the Government for the promotion of agriculture and the mechanic arts, should give instruction on a subject which is so vital to these interests. But this is one step in advance, and will offer opportunities for investigation to every one who wishes to estimate the advantages of good roads over bad ones, and to compare intelligently the merits of one good road with another. The influence of these model roads will extend beyond the immediate range of the community whose members ride over them daily, for the university attracts many visitors as a growing centre of interest to all interested in rural affairs in one way or another, and besides this, its professors, who publish bulletins of progress and who attend farmers' institutes in various parts of the state, will not fail to sound the praises and illustrate the value of these model highways.

It is altogether proper that the Professors of Agriculture and Horticulture should unite with the Professor of Civil Engineering in this matter. One of the most important matters in road-construction is proper drainage, and those who deal with soils should be competent advisers in the disposition of surplus water. Besides this, a road means something more than a mere wheelway. It should not only be a smooth surface to ride over, but it should be a pleasure to the eye. Even in its grading and alignment the appearance of the country should not be neglected, and on its borders the question of what to plant and how to plant, what vegetation to encourage and what to destroy, are matters in which the counsel of a professor of horticulture and landscape art ought to command respect.

New Hampshire Scenery.

THROUGHOUT the entire broad belt of parallel mountain-ranges included in the Appalachian system and extending from Quebec to Alabama, there is hardly a square mile in which the scenery is altogether tame or uninteresting. Persons who have been born and reared among these foot-hills or in these mountain valleys are almost invariably depressed when they find themselves in a land which is flat and comparatively featureless, because the variety of prospect which arises from a diversified surface has come to be a part of their mental conception of a country which is home-like and hospitable. From every elevated point in all this region one can enjoy a picture which has a character of its own, and yet shows a kinship to all the rest. The constitution of the forest may vary, the sky-line of the distant mountains may have a different sweep, the flowers by way-side or by brook-side may be unfamiliar, but, after all, a subtle relationship can be traced between them all, so that one who has passed his life among the luxuriant forests and towering heights of western North Carolina will find enough that is distinct in the scenery of New Hampshire to invest it with the charm of novelty and yet enough that is familiar in its character to remind him pleasantly of home.

As the Appalachian system is narrowed in and lifted to greater elevations in New Hampshire, its mountain scenery is, of course, bolder than that of Pennsylvania, for example, but a picture of one of its quieter landscapes, like that in the foreground of the illustration on page 366, might have been taken in any one of half a dozen states. The dim outlines of the distant mountains, however, have a nobility which belongs peculiarly to the White Hills—a certain massiveness and grandeur which is only seen at points where the Appalachian ridges attain their greatest altitude. Aside from the distant mountain view, the sparkling water and graceful masses of foliage which make up this picture can be found in an hour's walk from almost any part of the hill country of which we speak. This particular picture seems so beautiful because the artist who caught it has the rare instinct to select the proper point of view to make a perfect composition. There are a hundred brooks which hurry down the slopes and loiter in these valleys which are as beautiful as the one in the picture. They may be overhung, as this one is, by Elms and Alders, or by Birches and Willows, or by Hornbeams and Black Ashes, but they always foam and tumble in the same happy way down mountain-slopes among rocks covered with ferns and mosses and then spread out in shallows, as this one does, to mirror the light of the sky and give life and sparkle to the landscape. A country where the air is filled with the murmur of brooks is always a beautiful country. Running water is itself beautiful, and it means a rolling and broken surface with hills and mountains down which it flows with abundant moisture to ensure a mantle of verdure for every scene.

A "Massachusetts Forest."

IT is remarkable how little the populations of our great cities often know of prominent and important features of the landscape close at hand. A notable instance of this is to be found in the beautiful range of the Blue Hills, near Boston. These hills are the highest elevations in eastern Massachusetts, and are the only eminences of a distinctively mountainous character near the Atlantic coast-line of the United States south of Mount Agamenticus, near Kittery, in Maine. The highest summit is known as the "Big Blue," and is the westernmost of the range, where stands the stone tower of the Rotch Meteorological Observatory, a privately endowed institution, which is performing a valuable scientific service. This summit is 635 feet above the sea-level, but being so near the ocean that altitude shows for its full value, giving an appearance of height greater than that often possessed by inland elevations very much superior.

The Blue Hills are the most prominent landscape feature of the coast of Massachusetts Bay and of the "Boston Basin," as it is called, of which they form the southern wall. Their noble undulating lines, presenting a succession of gracefully sweeping curves, like inverted crescents, form charming backgrounds of the views to the southward from Franklin Park and the Arnold Arboretum. From the former, the range, lifting itself without foreshortening on the thither side of the Neponset Valley, and thereby gaining in dignity and apparent elevation, appears to be included in the park which, in the noble vista from the southern end of the Playstead Overlook down the great central meadow of the Country Park, seems to stretch away to the very base of the hills. This lovely pastoral landscape has a beautiful complement near by. From the outlook point of the recently completed Loop road of the Wilderness in the park, the Blue Hills form the background of a perfect sylvan picture, making the focal element of the composition, as it may well be called, of one of Mr. Olmsted's most exquisite creations. Whoever has seen this enchanting view—standing at the edge of a parapet at the head of a rocky ravine in the steep hill-side, with a glimpse of the main drive of the park smoothly gleaming as it curves and loses itself in the trees just below with a sort of river-like effect (very much, it may be presumed, like those simulations of water made with surfaces of sand in the gardens of the Japanese), and overlooking an unbroken billowy expanse of woodland, varied with the shadings and forms of commingling deciduous and coniferous trees, the stately hills closing in the vista—whoever has seen this will not be likely to forget it. It is one of those rare landscape passages which, like that sight of the Wartburg framed in the foliage of the Thuringian forest from a hill-side near Eisenach, is treasured most preciously in the memory, and is destined to become equally famous.

The Blue Hills are thus familiar to thousands at a distance, and very many who have thus gazed in delighted admiration have been filled with the curious longing, that generally arises at such times, to know them close at hand and gaze from their summits over the widespreading landscape that must thence be disclosed. But of those thousands very few have ever visited the spot, although the hills are, indeed, a favorite excursion-ground for many nature-lovers—like the members of the Appalachian Club, for instance. It would be thought, however, that a range of hills like this, close to a great city, would long since have become popular and celebrated as a pleasure-resort, as they certainly would in the neighborhood of a European metropolis.

The views from those summits are remarkably far-reaching and varied. They embrace a great extent of coast and inland scenery: the blue sea indenting the shores, meandering rivers, wide meadows and plains, clustering towns, forest-expanses, hilly undulations, and the lofty peaks of far-away mountains—Monadnock and Wachusett, with other ranges more distant. To the northward lies the great city, spreading until its mass of buildings is lost beyond the hills which they cover. Its noise is hushed, its bustle not apparent save in the smoky streamers that float like dusky pennants in the air. One feels no sense of the swarming multitudes with their manifold occupations, burdens and cares, concentrated in that space which, though so limited in comparison with the vast encircling horizon, holds a third of the population of the next to the most densely populated state in the Union. To the southward, however, the contrast to the city is impressive. Save for a peeping spire, or a distant town that seems but a wee cluster of houses, seen at intervals, the earth's surface appears as a vast wilderness, almost as unbroken as it must have looked when the eye of a white man first gazed from these hill-tops. Close at hand, on the southerly side, just at the foot of the Big Blue, nestles the beautiful placid sheet called Ponkapog Pond. Near by Mr. T. B. Aldrich, the poet, has his summer-home amid surroundings where it seems hardly possible that it could be only twelve miles removed from the turmoil of a great city.

In all this varied landscape human occupancy seems but a passing incident, much as it has done to change the face of nature. The abiding impression is that of Nature herself, and humanity appears to be but one of her forces, temporarily modifying the earth's surface, like the beavers, the ants or the earth-worms. And how the trees serve to veil the structures of man! I have been struck by this even on the verge of London, where trees seemed the main feature, with brick walls and roofs but peering between them. After all it would take but a few years of absence on the part of man for all this expanse to relapse into utter wildness, wiping out all signs of our handiwork just as the sponge effaces the chalk-marks from a blackboard.

The air on these hill-tops is like that of the mountains, pure and bracing, for the winds sweep freely from all sides. Here would be an ideal place for a great sanitarium, for close-at-hand people of limited means, who cannot afford long journeys, would find all the attractions of air and scenery for which many are accustomed to travel hundreds of miles.

The most convenient way to reach the Blue Hills is to take the cars of either the Providence division of the Old

Colony, or the New York & New England, to Readville Station, in the town of Hyde Park. The two stations are within a few hundred feet of each other. From here it is an easy walk of something over two miles to the place where the Canton turnpike crosses the westerly shoulder of the Big Blue. There are also carriages always to be had at the railway-stations at reasonable rates. The way to the hills is over pleasant roads. It is only a short distance to the Neponset River, which is crossed by a picturesque stone-arched bridge. Passing the river we come into the town of Milton, one of the wealthiest and most beautiful in the neighborhood of Boston. It is filled with fine country-seats. The land is mostly in large holdings, the cutting up into small lots and the encouragement of a numerous population having been discouraged by the residents. The consequent effect is to give the town a peculiarly English, park-like character.

The Blue Hill range is chiefly in Milton, though a large portion lies in Canton, the next town to the southward, and in the city of Quincy, to the eastward. It is not generally known that it is to these hills that the commonwealth of Massachusetts owes its name. The country about the bay was called by the Indians living hereabout "Massachusetts," a word which in the Algonquin tongue literally means "the Great Hills Place." Thus it was that Massachusetts Bay received its name; thence the colony and the province of Massachusetts Bay, and finally the commonwealth of Massachusetts. It seems appropriate that the last remnant of the Indians hereabout, the Ponkapog tribe, lived on the southerly verge of these hills at the place that still bears their name, and where possibly some of their descendants may yet be found absorbed in the rural population of the neighborhood.

Even merely for the sake of commemorating the origin of the name of the great state from which has arisen the glorious fabric of our mighty republic, with its free institutions—aside from the remarkable beauty and picturesque character of the region—it would seem to be extremely desirable that this noble range, which thus gave Massachusetts its name, should in some way be forever dedicated to public uses. The best way to accomplish this end would seem to be for the state to take the entire region occupied by the hills, which is still for the greater part in a wild, woodland state, and make a permanent forest-reservation of it. "The Massachusetts Forest" would be an exceedingly appropriate name for the place.

It would require a special legislative act for the purpose. Action under the Public Forest Law—under which, by the way, nothing has ever yet been done—would be hardly practicable, as it would be difficult to get the three communities in which the range lies to unite to this end. If the matter were properly brought before the legislature the patriotic purpose underlying the proposition, which should appeal to every true son of Massachusetts, ought to be sufficient to secure favorable action, to say nothing of the great benefit which would be conferred upon the entire state by the creation of so beautiful and valuable a public domain. Within sight of these hill-tops there lies more than half the population and more than half of the property value of this thickly peopled and rich commonwealth. The establishment of such a public forest would greatly advance the happiness and health of this population, and would thereby, in increasing the attractiveness of the region, correspondingly enhance its prosperity.

A special act, taking this region for the purpose, and providing the means for its administration and improvement, would, therefore, be necessary. It would probably be a good idea to place the domain in charge of the newly created society called "The Trustees for the Preservation of Beautiful and Historic Places." The task could be entrusted to no more willing and capable hands.

The cost would not be great. The land is rough and of comparatively little value. Much of it would probably be given by the owners for such a purpose, as was the case with the Great Woods of Lynn. The rest could be obtained at low figures, either by ordinary purchase or under the right of eminent domain.

The improvement of a tract of such a nature would be comparatively inexpensive also. The most that would be needed would be to protect it from fires and other devastations, and to secure a forest-growth where desirable. Then a system of good roads, winding along the slopes, with vistas opening out through the trees here and there, and with branches to the summits, should be created. This system, connecting with the nearest railway points, would render the range easily accessible to the great population of the city and of the entire surrounding region. It would form one of the most beautiful drives, and a service of popular conveyances could be arranged for at cheap rates that would take passengers from one end of the range to the other, going by one railway route and returning by another. A round-trip ticket, covering the entire excursion, would bring it within the means of the multitude.

Favorable sites for hotels, sanitariums, restaurants, etc., could be leased to the right parties, under proper conditions, and, possibly, these might be approached by lines of electric railway connecting with the suburban services of the steam lines. With such conveniences these institutions could not fail to be liberally patronized, with a long season, lasting from spring-time well into the autumn.

By all means, then, let us have our "Massachusetts Forest." To that end I would suggest that persons naturally interested in bringing it about—such as the members of the Trustees for the Preservation of Beautiful and Historic Places, or of the Appalachian Club—take the matter definitely in hand, inform themselves as thoroughly as possible on the subject, including the character and conditions of the region, and unite in bringing it to the attention of the next General Court of Massachusetts.

Boston. *Sylvester Baxter.*

How We Renewed an Old Place.

XV.—SUFFERINGS FROM DROUGHT.

On the south shore of Massachusetts Bay almost every summer sees a long period of rainless weather. The thunderstorms that gather portentously after hot days are apt to drift away to the north, with only the tiniest sprinkling of our dusty roads and parched fields, to pour their wealth upon the crags of Swampscot and Lynn, Beverly and Marblehead. With jealous eyes we watch the rain descending upon our opposite neighbors of the north shore, while we continue to dry up for want of it.

This period of dry weather usually begins about the last of June and continues well into August, which is ordinarily wet and muggy, but the spring and summer of 1891 seem disposed to defy precedent. April, which from time immemorial has been depended on for showers, this year completely spoiled its record, and only gave us an inch and a fraction of rain. This was followed by a dry, cold May, and then came the first half of June without a drop, culminating in two days the like of which we seldom see, the mercury touching ninety-seven degrees in the shade. Then, at last, down came the floods with a rush, and refreshed the parched and thirsty earth for days, the first continued rain-storm for three months, sorely needed by the suffering hay-crop and the dwindling trees.

During a rain in this locality, where the soil is light and sandy, the care of lawns and gardens has to be incessant. Fortunately our old town has a fine supply of aqueduct water brought from a nearly inexhaustible pond within its limits, and the hose can be brought to bear with effect upon the worst places; but this, like other restoratives, must be used with moderation. Too much water cakes the soil and draws the roots to the surface, so that, once begun, it must be continued or the plants die. It is better, we find, to water heavily two or three times a week than to keep up a continued sprinkling. If the water plays upon trees and shrubs during hot sunshine, the leaves are apt to scorch and shrivel, and the same is true of vegetables, which are well known to resent being watered on a hot day.

At Overlea the garden, which lies low along the edges of the meadow, can get along very fairly without watering. Even this year the strawberry crop, which is very sensitive to a lack of moisture, did not suffer from the dry weather, possibly owing to heavy mulching with straw while the ground was

moist from showers. The worst of droughts in June is never so bad as the same dryness in July, for plants, which are then in fullest vigor, can better bear the strain upon their constitutions at that time; it gives them a set-back, however, which prevents a vigorous growth. Grass is the greatest sufferer, and the first hay-crop is often ruined by lack of rain, as was the case this year in our neighborhood.

Upon the sandy knoll where our house is situated, and especially along the street, in places only accessible to a very long hose, the trees and turf suffered greatly, and the sudden drop of fifty degrees of temperature at the end of the period of drought, had a most disastrous effect upon the leaves, which shriveled and curled and turned red, and dropped off in many instances. A vigorous young Catalpa on our lawn, which, after the cautious manner of its kind, only ventured to put on its spring gown after the first of June, and then undertook to blossom freely, was so distressed by the changes of the weather that, after the storm, we found at least two bushels of leaves strewing the ground beneath it, and many others in such a condition that the lightest touch would detach them. Enough remained, however, to protect the blossoms, which are wonderful productions for a tree to bear. If each one grew in a garden on a single slender stem one would value it for its exquisite painted beauty, and delicate perfume; and to find a great spike of them decorating a burly tree is a constant source of astonishment at the prodigality of Nature. It is like the appearance of a fine gentleman of the last century in a ruffled shirt and diamond shoe-buckles, among the more plainly coated *fin de siècle* beaux of our own day.

I have a great admiration for a Catalpa; its huge vivid green leaves give it a semi-tropical air, and its sensitiveness to cold and storm shows that it comes naturally from a warmer clime than ours. I try to console it for its exile by lending it in summer-time our Amazon parrot for a companion, and there is no prettier sight than the vision of this lovely green bird, of exactly the shades of the sunlight and shadow on the Catalpa-leaves, pluming himself untethered upon the inner branches, only caged by the dome of the great boughs with their verdant canopy. When the leaves are in their prime he is perfectly concealed from view by his color, even when he takes a fancy to perch upon an outer bough; and there he mocks and jeers at the passers-by with songs and laughter and merry cries, till you would think a whole primary school was let loose upon the lawn and all the pupils calling each other by name, or else that this was a lunatic asylum.

To return to the line of trees that border the street. We find that it is not safe to leave them without a heavy top-dressing to act as mulch, and this application having been delayed this year by press of business, we found one good-sized Elm, that we imagined to be settled for life, dropping its leaves and turning brown in a most unbecoming manner, while the smaller and more recently planted trees were also showing signs of distress. A good dousing and dressing brought them all to, however, and when the mowing of the swale after the rain allowed us to make the rounds of the plantation, we discovered that the only serious sufferers were our newly set Pines, which are bringing the hill into disrepute by their brown and sear condition. This eminence naturally suffers severely from drought and hot weather; the little Oaks and Chestnuts burn up, and the Pines wilt distressingly, but they are so numerous that there is nothing to be done for them but to await the survival of the fittest. An Oak once rooted is rooted forever, but it is a question of time as to when it can maintain its top, and ours have burned off year after year, until now they seem to have gained vigor enough to hang on in spite of fate.

Among the searching questions that are put to the members of the Society of Friends, in their meetings for the investigation of personal character, one of the queries is, "Has any Friend entered into business beyond his ability to manage?"

This question we are obliged to answer in the affirmative when we take time to ask it of ourselves, for, having outlined work enough for a dozen men, it becomes a puzzle how to carry it on with only the aid of one factotum; extra hands being very hard to obtain in this village during the summer months. Much that we do is accordingly a makeshift. I am sadly obliged to confess to the existence of weeds where no weeds should be, of neglected spaces, of trees on the hill smothered by grass, of rose-bugs unslain, and caterpillars left at large; of a struggle for general effect, rather than a realization of neatness in detail, all of which is most reprehensible and melancholy. We look at our neighbors' neat gardens with remorse and envy, and can only console ourselves by reflecting that when they are gone the weeds will have their way, but that in our struggle with nature in the end the trees will win and trample the weeds under their mighty feet, and rear their stately heads proudly, while the Beets and Carrots of a future generation are still struggling with their yearly foes.

In a recent visit to the shores of the Merrimac, I have seen hills carpeted with the fallen leaves of haughty Pines that have numbered some centuries of growth, and I can smile at the flaunting Daisies of the hill, which overtop our baby Evergreens, and threaten to exterminate them. Your days are numbered, O weeds! Wave now and dance in the sunshine while you may, for the first nails are being driven in your coffins. Little you reck that the small brown spines that disappear at your roots are the first drops of a rising tide that is to bury your bright blossoms, and strangle your weedy growth. For a few years to come you may preen yourselves upon the hill-side, but the tiny seedlings below are rising higher and higher, wider spread their green arms, thicker falls the brown shower, which at first nourishes your gaudy uselessness, but at last shall arise and overwhelm it forever. The gay and trivial have their little day of sunshine and triumph, but the strong roots of serious vigor endure when the sunlight fails and the winter winds blow. Everything in the lower is typical of the higher life, and the Ephemeral for a time seems brighter and stronger than the Eternal; but not forever. Though speed may tell in a short race, it is bottom that wins the long ones, and it is the patient who inherit the earth.

This is the great lesson of the forest, the philosophy it plants in him who nourishes it and awaits its growth. In the faint rustle of the tiny leaflets I hear the murmur, "Wait!" and as I wander under the shade of trees a hundred years old, I hear the echo far above me of that tender cry, in a solemn whisper: "Wait! They, too, shall be as we are, giants in their day. What matters it that thy little life will be long over? for thee the weeds and battle, for others the shade and rest. Plant thou! that is thy mission, and the joy of him who reaps the fruit of thy labors shall be no greater than thine. Knowest thou not, O thou of little faith! that to look forward is the best of joys? Thy reward is renewed to thee daily in thy hope. Learn patience, and content thy soul."

And so the young trees and the old alike give counsel to him who can understand their language, whether he bends to listen to the soft voice at his feet, or lifts his head to catch the diapason of the overarching forest; encouraged by the lesson, we take up our burden anew, in our case the burden of a watering-pot, and do battle with the drought with a braver heart and sturdier resolution.

Hingham, Mass. *M. C. Robbins.*

Changes Which Trees Create.

APART from the influence of trees upon the general climate of a country, which has over and over again been proved to be very great, trees play a very important part in ameliorating the extremes of temperature in a local sense. Many of what are now our most enjoyable country-seats but for the presence of trees would be little better than bleak and comfortless downs. In situations where hills and valleys alternate, much may be done by a judicious selection of the spot where the dwelling is to be placed; but even then, without the presence of trees, the site is never complete. The charm of what are now some of the most lovely spots in these islands would at once vanish if they were deprived of their trees, and not only their charm in a picturesque sense, but in that of bodily comfort. To one who has dwelt upon a more or less bare and wind-swept upland, the sense of comfort in the removal to a spot sheltered by clustering woods will be very grateful, and more eloquent than the most fluent description.

In considering the best use which can be made of trees for shelter, the conditions existing must, of course, be taken into account, namely, whether the house is already in existence, and the trees have to be arranged to produce the greatest amount of shelter in harmony with the necessities of the landscape, or whether the trees and woods are already growing, and the position of the house has to be determined upon from these. In the former case, for climatic reasons, the situation and alignment must be determined on to give the greatest resistance to the prevailing winds. In some cases other circumstances may interfere with this, but it is not often, with proper arrangement, such difficulties cannot be overcome. Other pens have condemned the practice of dotting trees about instead of throwing them into suitable masses, as an offense to the eye, and if it is desired to defeat the end of obtaining shelter from trees, this objectionable system will be the sure means of doing it, as trees so planted can be of no appreciable use for the purpose.

As in the landscape, so for equalizing heat and cold, trees and woods are required, and must be grown in masses. In

some parts of this country, although not the coldest, the winds, which are generally most unpleasant on account of their strength and prevalence, are the west and south-westerly ones. From these some shelter is most desirable, but as, on the other hand, the afternoon sun shines from this direction, some discrimination is necessary that in cutting off the effects of the wind the sun is not excluded as well. There is no reason, however, why the advantage of both should not be gained, as by the suitable arrangement and selection of subjects there need be no great difficulty in the matter.—*The Garden* (London).

New or Little-known Plants.

New Orchids.

Odontoglossum × excellens, Rchb. f.—It is interesting to observe that the parentage of this handsome natural hybrid has now been proved. Mr. Seden, the well-known hybridist of the firm of Messrs. James Veitch & Sons, of Chelsea, has obtained it by crossing *O. Pescatorei* with the pollen of *O. triumphans*, the plant having flowered for the first time during May of the present year.—*Gardeners' Chronicle*, June 20th, p. 754.

Zygopetalum guttatum, Rchb. f.—This long-lost species has apparently reappeared, a specimen having been sent to Kew for identification by Mr. J. O'Brien, of Harrow-on-the-Hill, which, although not quite identical with the original form, still appears to belong to the same species. It belongs to the section *Promenæa*, and bears much resemblance to the elegant little *Z. xanthinum*, with which it grows, as both appeared out of the same clump of plants. The flowers are light yellow, the sepals and petals with numerous light brown spots, the base of the column dark purple, and the basal half of the lip marked with the same color.—*Gardeners' Chronicle*, June 27th, p. 784.

Odontoglossum × Leroyanum, Castle.—This interesting hybrid, in reality a variety of *O.* × *Wilckeanum*, and proves the parentage so long suspected, was raised by Monsieur Leroy in the collection of Baron Edward de Rothschild, of Armainvilliers, near Paris, by crossing *O. crispum* with the pollen of *O. luteopurpureum*. There is an excellent colored plate in the April number of *L'Orchidophile*, p. 112.

Aeranthus brachycentron, Regel.—A species said to have been imported by Messrs. F. Sander & Co., of St. Albans, probably from the Comoro Islands, and received at the St. Petersburg Botanic Garden as *A. Grandidierianus*, Rchb. f., which, however, is quite different. I do not see any character by which the supposed novelty can be distinguished from *Aëranthes* (not *Aeranthus*) *grandiflorus*, Lindl., with which I believe it to be synonymous.—*Gartenflora*, xl., pp. 323, 324, fig. 68.

Kew. *R. A. Rolfe.*

Plant Notes.

Some Recent Portraits.

The July issue of the *Botanical Magazine* will not, from the nature of the plants figured, be found as interesting, perhaps, as usual to horticulturists. It contains portraits of *Musa Basjoo* (t. 7182), a species which has the habit and general characters of the common *M. sapientum*, although differing from all other cultivated Plantains and Bananas in structural details. This plant, which was introduced into England from Japan by the Messrs. Veitch, in whose nursery at Coombe Wood it stood in the open ground for a number of years, is supposed to be a native of the Liu-kiu Archipelago, a group of islands which stretches from Japan nearly to Formosa, and to be the plant cultivated in southern Japan for the fibre yielded by its leaves; *Hibiscus venustus* (t. 7183) is described as a magnificent species whose native country is doubtful, it having first been made known from a plant cultivated in Java. The portrait is from a specimen grown in England, and supposed to have been procured from the island of Tahiti. *H. venustus* is a large shrub clothed with short, close pubescence, stout branches, large, nearly orbicular, deeply lobed leaves, and pale yellow inclined flowers three inches in diameter; *Synadenium arborescens* (t. 7184), a Euphorbiaceous shrub of Natal, rather curious than beautiful; *Masdevallia platyglossa* (t. 7185), a small and very inconspicuously flowered species of no more garden value than many others of this now popular genus. The leaves are three or four inches long, oblong or elliptical-lanceolate, acute and coriaceous. The flower-stems are as long or longer than the leaves, and are pendulous, as thick as crow-quills, sheathed with pale greenish yellow sheaths and bear pale yellow flowers streaked bright red on the ovary; *Stenoglottis longifolia* (t. 7186), a terrestrial Orchid from Natal, with lilac-purple flowers. The genus to which it belongs has hitherto been represented by a single species, the *S. fimbriata* of Lindley, also a native of Natal, and distinguished from the present plant by its shorter oblong leaves, narrowed at the base and blotched with black, a slender scape, and fewer and smaller flowers.

A beautiful colored plate of *Nepeta Mussini* is published in the 1st of July number of the *Revue Horticole*, accompanied by a note from the pen of Monsieur André, who recommends this small Caucasian Labiate as an admirable subject to grow in the rock garden in sunny and exposed situations. Like the other species of the genus, the whole plant possesses a strong and aromatic odor. The flowers, which are light blue and contrast pleasantly with the pale puberulous foliage, appear from May to July in the neighborhood of Paris. If the flower-stalks are removed, the plants will produce another crop of flowers toward autumn.

The *Gardeners' Chronicle* of July 4th contains two figures of *Acer Vloxemi*, a fine Maple discovered by Mr. Jean Van Vloxem in the Caucasus, and heretofore generally believed to be merely a form of *A. Pseudo-Platanus*, although Dr. Masters, in whose garden it has been growing for a number of years, has always considered it distinct from that species. His idea is now confirmed by the character of the inflorescence, which has been produced in Mr. Van Vloxem's garden, and which, instead of being racemose and pendulous, is erect and corymbose, with glabrous filaments. Whether this handsome tree, which is remarkable for its robust and rapid growth and for the silvery whiteness of the under surface of the leaves, is distinct from *A. insigne* of Boissier, is a question which Dr. Masters promises to discuss in connection with the figure of this last species, which is to appear, he tells us, in an early issue of the *Gardeners' Chronicle*. Whether *A. Vloxemi* is a distinct species or not, it is certainly a beautiful and distinct plant from the horticultural point of view, and well worth growing wherever the climate suits it.

Cultural Department.

Stray Notes from the Arnold Arboretum.—VII.

We are accustomed to think of the fruits of ornamental trees and shrubs as if they belonged to the autumn or to the winter, and do not always remember that some of the most beautiful of them ripen in summer, and so do not always sufficiently consider shrubs from this point of view in studying the composition of our shrubberies. Many shrubs, however, are better worth cultivating for the display of fruit they can make than for the flowers which cover their branches earlier in the year.

The earliest hardy shrub which makes any great show of fruit in this climate is the Mezereum (*Daphne Mezereum*). This is a small plant which belongs to the colder parts of Europe and Asia, and is so hardy that it is able to grow on the borders of the Arctic region itself. The flowers are pink or sometimes white, and they appear (by the middle of April in this climate) in little clusters, which cover the stems formed during the previous summer. One of these plants in flower is a bright and beautiful object, and it is all the more beautiful because the flowers open very early in the season, sometimes before the snow has disappeared and when flowers are scarce, and therefore more valuable than they are a week or two later. But this plant is more beautiful two months later, when the large bright red, lustrous fruit ripens. This quite covers the branches, and makes a fine contrast to the dark green leaves. It is a hardy and beautiful little plant, which has been cultivated in European gardens for three centuries at least, and yet we rarely find it in those of this country. There is no better plant for a small garden, especially for the garden of the man who, like many Americans, is away from home during the summer months and wants his garden attractive before the hot weather drives him to the sea-shore or to the mountains. Now, a plant like *D. Mezereum*, which does its work for the year between the first of April and the first of July, showing all its beauty during these few weeks, is the plant of all others for the spring garden. It is hardy; it flowers every year; it is not very particular about soil or exposure, and it only grows two feet high. These would seem to be qualities which would make a plant popular; and it is remarkable that florists and small nurserymen, who make a business of supplying plants for the door-yards and small gardens of our cities and their suburbs, have not yet got hold of the Mezereum. Perhaps it is because it takes some time to make a plant large enough to sell, as the Mezereum cannot be struck from soft-wood cuttings like Hydrangeas, Spiræas, and other coarse-

Fig. 61.—A New Hampshire Brook-side.—See page 361.

growing shrubs. Bigness and cheapness are still, unfortunately, the chief factors which influence the choice of the great proportion of American plant-buyers. The popular plant is pretty sure to be the one which will grow quickest to the largest size, and is therefore the most profitable plant to sell.

The florist and the nurseryman set the fashion in planting for nine-tenths of us Americans, and until we instruct ourselves about plants and learn their good and bad points so as to have opinions of our own, we must be satisfied with second-hand knowledge, and go on planting what we are told are the finest novelties which have appeared for years. We can get some idea of a plant by reading about it, or by seeing a picture of it; if it is not one of those pictures used to decorate that branch of the literature of horticulture from which most people draw their inspiration; but the real way to know a plant is to see it growing, and to watch it from month to month and from year to year. This is why arboreta and botanic gardens can be made of popular interest and value, if they are managed with the view of affording information with regard to plants in their horticultural aspects, and why each centre of population in the country should be supplied with a well-equipped establishment of this class. In these establishments people can see plants of all sorts growing, and can learn which ones are best suited to their particular needs.

A summer-fruiting shrub which is beautiful in July is the Japanese *Elæagnus longipes*, of which a figure was published in the first volume of Garden and Forest (499, f. 78). It has now become well known, and a few nurserymen are raising it in considerable quantities. Their confidence seems to be justified, for this is a plant which improves with age, and has not developed yet any disease, want of vigor or special attractions to devouring insects. It bears great crops of fruit which ripens about the middle of July and hangs for some time on the branches. The fruit is brilliant, although, as it is suspended on long stalks under the leaves, it does not make much show from a distance, and the branches have to be turned up with the hand in order to bring it into full view. It is edible, and some people find the sub-acid flavor delicious. Certainly it is as good as a currant, and better than a gooseberry, and with good cultivation and careful selection might develop into something for the table really worth talking about. The leaves, too, are beautiful—very dark above, and silvery white on the lower surface. The flowers, like those of most of the genus, are small, yellow, and not conspicuous. *E. longipes* appears to be entirely worthy of confidence, so far as can be determined by the results of the experiments which have been made with it in the Arboretum, in which it has now been growing and fruiting for a number of years.

The great summer-fruiting shrubs, however, are the so-called Bush Honeysuckles. The most commonly cultivated and best-known of them is the Tartarian Honeysuckle, a very hardy and reliable plant which gardeners in some northern countries, especially in Russia, have worked over for many years, producing many varieties with flowers of various colors, ranging from pure white to dark rosy red. The Tartarian Honeysuckle is one of the best all-round shrubs known in gardens; it is hardy and easily propagated; it grows rapidly, and forms a great bush a dozen feet high sometimes, and as deep through the branches. The flowers are abundant and beautiful, and the fruit, which ripens in July, is brilliant, bright cherry-red on some plants, orange on others, and dark red on others; it is lustrous and almost translucent, and it looks as if it would be delicious to eat. Really it has about as nasty a taste as any fruit can have; but this serves to protect it from the birds, and so it loads the branches for weeks, and makes a brave show. But, fine as it is, there are finer Bush Honeysuckles at this season of the year. One of these is *Lonicera Ruprechtiana*, a very large shrub, or a small tree sometimes, it is said, in its native country, which is the region of the Amour River. The fruit is a third larger at least than that of the Tartarian Honeysuckle, and even more brilliant in color, so that a large plant of this species covered with fruit, and it is always covered at this season of the year, for it is a regular and profuse bloomer, is a remarkable object. Not less beautiful is the Japanese species, *L. Morrowi*, which is as hardy and as desirable in every way. The fruit is as large and as brilliant, but the flowers are rather less showy, although attractive and abundant.

There is a race of Bush Honeysuckles in the Arboretum which came here from a German nurseryman, under the name of *L. bella*. They appear to be hybrids between the Tartarian Honeysuckle and one of the two species just mentioned, although little is known about them. They are handsome plants, but not better or more beautiful than *L. Ruprechtiana*, as regards their flowers or their fruit, and, except as curiosities, are probably hardly worth growing for general decorative purposes.

The Bush Honeysuckles, or some of them (many of the species produce inconspicuous flowers and fruit and come from countries of less severe cold than those which have been mentioned), flourish, as Professor Budd has told the readers of Garden and Forest, in the cold dry climate of the western plains; they are hardy where no other shrub with such beautiful flowers and fruit can grow, and they succeed as well in the mild climate of New England and the middle states as they do in Canada or Nebraska. They are valuable plants for the gardens of the northern parts of this country and of British America, and it is to be regretted that the fine Russian varieties, raised by the gardeners of St. Petersburg, are not within reach of our people.

The Bush Honeysuckles grow so well, and endure so much neglect and bad treatment, that they are admirable plants for public parks, city squares and the grounds of railway stations, and all such places where it is impossible to give to plants the care they receive in good private gardens. Their fruit adds greatly to their value for such purposes, for they serve to bridge over the period of the year when shrubberies are apt to be less attractive than at any other—after the flowers have gone, and before the fruits of autumn ripen and the leaves take on their autumn colors. A plant of one of these Honeysuckles, loaded with its ripe fruit, which enlivens a whole shrubbery for weeks, is always a pleasure and a delight.

Arnold Arboretum. *P. C.*

The Persian Ranunculus.

DO you delight in variety of color? I say advisedly I do not know any class of flowers where the range is so great—from black, at least as black as we get in any flower, to pure white, through every shade of red and yellow, olive-green with yellow ground, edged with darkest markings like a variety of Picotee; some striped like a Carnation, others spotted, veined; in fact, there is hardly a tint of color which exists in flowers that may not be found in a good bed of Ranunculus. Do you admire symmetry of form? What can be more exquisite than the beautifully molded petals of this flower? Some may term it formal, and all double flowers as compared with single ones are liable to this charge; but there is an exquisite finish in the form of these flowers that wins admiration, perhaps even from the rigid botanist who declaims against all these things as monstrosities and violations of the laws of Nature.

One objection to growing the Ranunculus has been their supposed difficulty of cultivation. I used to imagine that the depth at which they were to be planted was to be so exactly gauged (an inch and a quarter) that I had my beds boarded round, and then a board cut to the required depth was forced into the beds, making a drill of that depth, at the bottom of which the tubers were placed, and then covered over; but I have found that this exactness is altogether unnecessary. I endeavor to plant them about this depth, and am convinced that shallow planting is required, but I do it in the ordinary way—draw a drill with a small hoe and then plant.

The plan which I adopt with my beds, which are about thirty-five feet long and four wide, is to prepare them in the autumn. The soil is ordinary light garden soil, and in the month of October, if it is in a fit condition, I dig in a good supply of old hotbed refuse, between three and four barrowfuls to each bed. This is left through the winter, and, if there is frost, it is turned up roughly, so that it may get the full benefit of it, leveling the soil, and, perhaps, destroying grubs, etc. I say perhaps because I am somewhat doubtful as to the effects of frost. About the 12th of February I prepare for planting, but I am not particular as to date. If the weather is favorable before that I do not hesitate to plant, and if it is unfavorable at that time, to defer it for a little longer. [In this country the planting in the latitude of New York could rarely be done before the middle of March.—Ed.] It is essential that the soil should be in good condition at planting time. The bed is then raked down and leveled, the rows are drawn about four inches apart, and, as I have said, from one and a half to two inches in depth. I have previously gone through my boxes, for I do not keep to names, but grow in mixture, and pick out for the principal bed the largest tubers. Allowing for three rows to a foot, and twelve in each row, the bed will take about 1,250. Of course, smaller beds can be made. As the Ranunculus, like most of its family, is fond of water, a dry spring is against them, and in such a case they may be watered thoroughly, once or oftener, if needed. I used to take a good deal of trouble to place an awning on the beds; for some years I have discontinued it, and am quite satisfied to do so for the

future. The flowering season may be a little shortened, but a good deal of trouble is saved, and the beds look better.

The harvesting of the roots is a matter of supreme importance. They must not be taken up before they are ripe, or they will shrink very much, and be feeble next year; nor must they be left too long, which is even more fatal to them, as they then begin to start, and when this is the case the tubers are good for nothing next year; so that should showery weather occur, as it very often does in the early part of July, a good deal of watchfulness is needed to catch the right time for lifting them. They should be placed, after the foliage has been cut off, in a cool, shady place, where they can get all the influence of the air without being exposed to direct sunlight. A cool, open shed is a capital place. They can be laid out thinly, and when they have been thoroughly cleared of all dirt they may be placed in boxes and brought into the house and placed anywhere free from frost.

Some years ago I obtained from Messrs. Ant. Roozen & Son, of Overveen, Holland, a few hundreds of Persian and Scotch (so-called) varieties. They were all named, and have, with some remains of Lightbody's collection, formed the foundation of my present one. I put them into mixture, knowing that I should probably have to weed out a good many, and so the event proved. Neither in these nor in Tulips are growers particular as to correctness of form, and admit among their Ranunculuses many that are not sufficiently double, and which show the black centre much too soon. These I have gradually weeded out, and I can now look on my beds with much satisfaction.

Of late years there has been a race introduced which is called the Giant French Ranunculus. The flowers are much larger than the ordinary Persian varieties, but they are not so double, and have the great defect of showing the eye very soon. They are brilliant in color, but not so varied. They make a good show in the garden, but will not please the critical taste of a connoisseur.—Correspondent of *Journal of Horticulture*, London.

Notes from the Harvard Botanic Garden.

Alströmeria aurantiaca.—Several of the Alströmerias are highly decorative border-plants, and were at one time very popular in gardens, but they have been much neglected of late years. *A. aurantiaca* is one of the best. It is a hardy herbaceous, tuberous-rooted perennial, introduced from Chili in 1831. The erect stems, from three to four feet high, are well clothed with linear-lanceolate, glaucous-green leaves from three to four inches long, and curiously twisted at the base, reversing the normal position of the upper and lower surfaces. This peculiar twisting of the leaves is, however, a feature of all the Alströmerias, and also of the closely allied genus Bomaria. The flowers of *A. aurantiaca*—the two upper divisions of which are deep yellow, with numerous longitudinal lines of dark red, the others of a bright orange color—are about two inches across, and as many as twenty of them appear in the form of a terminal umbel. They last a long time when cut, and the long, straight stems upon which the heads of bloom are borne, render them doubly useful for that purpose. If we except the Lilies, it would be hard to find a plant whose flowers produce a more pleasing effect. But while less striking than many members of this royal race, its floral charms are longer continued, lasting throughout June, July and August, three very severe months on most flowers. The plant likes an open, sunny position and rich sandy soil. Excessive moisture about the roots in winter is dangerous, and therefore it should be planted from six to nine inches deep, but at a considerable elevation above the general level. Mulching with dry litter also tends to ward off superfluous water. Abundant moisture, however, is indispensable during the drought of an American summer, and in dry weather a thorough watering is a daily necessity. It is propagated by dividing the crowns late in autumn, or by sowing the seeds under cover when perfectly ripe. The latter method is much the safest, old established roots being rather uncertain in their behavior after they are transplanted.

Anemone Robinsoniana.—This is perhaps the prettiest of the several varieties of *A. nemorosa*, the Wood Anemone. It was brought prominently before the gardening public some years ago by Mr. William Robinson, editor of *The Garden*, and named in compliment to him. It is a rare plant, growing wild in various parts of England. The blue form of *A. nemorosa*, sometimes found in American woods, resembles it very closely, but the English variety, under the same treatment, bears larger flowers of a deeper color. *A. Robinsoniana* is about six inches in height, the deep sky-blue flowers, an inch and a half in diameter, cresting the compact mass of elegant pale green foliage. The blooms do not last a great length of time when cut, but the plant is very desirable on account of its early and free-flowering qualities. The flowering season proper extends from the latter end of March until the middle of May, and in cold, late seasons the charming blossoms may be seen as late as June and July. There are no difficulties attending the cultivation of this plant provided it is given a dry position, well shaded by trees, and soil in which leaf-mold predominates. These conditions are found on the margins of natural woods composed in greatest part of deciduous trees, and the cultivator of the Wood Anemone, or any of its varieties, who can reproduce these conditions most perfectly will obtain the greatest amount of satisfaction from his plants.

Epilobium angustifolium.—This is a common plant in many parts of the world, including the United States, but is not unworthy of a place in gardens. It has many common names, among them Great Willow Herb, French Willow, Rose Bay and Fire Weed. It occurs most plentifully in newly settled districts, and soon forms a conspicuous feature of the landscape of those woody regions that have been swept by fire; hence the name Fire Weed. The plant attains a height of five feet and spreads rapidly under cultivation, bearing large racemes of bright purple flowers in June and July. These are followed by numerous long seed-pods, containing, with the seeds, a large quantity of fine white silky down, which, when the pods burst in July and August, is scattered about all over the plant, giving it a fluffy appearance. A variety, *E. angustifolium album*, has pure white flowers. Both are eminently floriferous and useful for cutting. They thrive well in any ordinary soil, but should be given abundance of space, as, otherwise, they are liable to smother plants of a less aggressive character. The seeds are easy to raise, and those who have attempted to remove the roots of *E. angustifolium* do not need to be told of their vitality, as every piece an inch in length is almost certain to grow and form a plant.

Lythrum Salicaria.—Few of the European plants which have become naturalized in this country are more desirable than the Purple or Spiked Loosestrife now common in wet meadows, from Nova Scotia to Delaware. In Europe it is usually found on the banks of rivers and ponds, and it is useful for the adornment of artificial pieces of water. It is also a desirable border-plant, thriving luxuriantly in a deep, moist loam. The plant is from three to four feet high, the stems and numerous branches four-sided, well clothed with dark green, oblong leaves, and each terminating with a long spike of dark purple flowers. The flowering season extends throughout June, July and August, and the tall inflorescences have a charming effect when loosely arranged in suitable vases. There are two well-known varieties of this plant; one known as Roseum, with paler flowers than the species, and the other Superbum, in which the flowers are larger. Either one of the varieties is preferable to the type, inasmuch as they flower more freely. All are readily increased by cuttings and by division. *L. Salicaria* has an interest from the fact that Darwin used it, with many other plants, for illustrating the theory of evolution.

Cambridge, Mass. *M. Barker.*

How to have Clean Flower Pots.

HAVING been very much annoyed by the rapid growth of Algæ (Protococcus) on pots in greenhouses, a trouble which necessitates the frequent shifting of plants from foul pots to clean ones, besides attendant scrubbing with soap and sand, I have been lead to try a large number of preparations for the prevention of this fungal growth which, at the same time, would not injure the health of plants. After many experiments I have found that new pots, soaked in ammoniacal solution (United States Department formula), become impregnated with the copper salts, rendering it impossible for the germs of this fungus to obtain a foothold. Experiments with this solution, extending back to February, prove its value, as pots soaked then have resisted the attacks of this fungus and are as clean as when first used, while new pots, used at the same time, without being soaked, are completely covered, and in every case the same results have been obtained, both in the greenhouse at this station and in the houses of one of the leading nurserymen of this place. I am of the opinion that it will be necessary to soak the pots at intervals of at least once a year, which will not be a very serious matter, considering the large saving, both in time and money, which is accomplished by this method.

Almost all nurserymen and florists find that there is a considerable expense connected with the washing of pots, even

when done by boys, but as this solution is quite inexpensive, and pots can be soaked so readily, this cost can be reduced to a trifle. It seems probable that, after this bath has been thoroughly tested and in general use, the manufacturers of pots and other earthenware will offer on the market goods soaked in copper solutions, as they can accomplish the same end cheaper than individuals, thus lessening the expense to the florist or private gardener who takes pride in having his pots clean at all times.

These soaked pots have been used for several classes of plants, Roses, Gloxinias, Primulas and others, and at this writing I can perceive no indications of injury to any of them; in fact, I think the ammonia in the solution is, to a limited extent, a benefit. The formula for this solution is as follows: five ounces of copper carbonate dissolved in three pints of ammonia, twenty-six degrees strength, diluted with fifty gallons of water.

Experiment Station, Geneva, N. Y. *C. E. Hunn.*

Cypripedium Curtisii.

THIS remarkable plant is now tolerably well known to all growers of Orchids both in England and on the Continent, and, no doubt, also in America. It is well worthy of a place in every collection, as it is easily grown, and repays the attention given to it by its large flowers and handsome foliage. Like many other Orchids, it improves under cultivation, both leaves and flowers becoming larger, more substantial, and better colored year after year. In a fine specimen which I recently saw, the broadly cordate upper sepal was large, and had a conspicuous white border surrounding a deep green area, the surface of which is longitudinally striped alternately with dull purple and dark green, and is also decorated near the base with a transverse zone of dull purple. The lower sepal is much smaller, whitish, with pale green stripes. The ligulate petals are slightly bent down, and are more or less recurved or twisted at the pointed apex. Three colors are chiefly noticeable on the surface, namely, dark olive-green at the base, which passes into white or whitish green in the centre, and bright rose beyond this to the apex. The whole is covered densely with blackish purple blotches, which stand out prominently on the middle and apical portion, owing to the delicacy of the ground color. The first thing that strikes one in beholding the flowers of *C. Curtisii* is the enormous size of the lip, that is, in comparison with the other parts of the flower. In front it is of a dull purple-red, with deeper colored veins, becoming pale green behind, while the inflexed lobes of the base are of a soft pinky rose, studded with purple warts, the tips of which sparkle like diamonds in the sunlight. The upper sepal, especially on the back, and the petals on the margins are all very hairy, the large lip even having short stubby hairs arranged round the edge of the orifice as well as on the surface. The leaves are elliptic-oblong, light green, with oblong patches of dark green, presenting a handsome chequered appearance. As a rule, the flowers appear singly on the tops of the dark purple pubescent scapes, but instances have been noticed where two flowers have been produced on one scape. Where there are several plants, flowers may be expected to appear between January and July—some plants flowering earlier than others.

The native country of *C. Curtisii* is Sumatra, where it was discovered on the mountain-ranges, at an elevation of from 3,000 to 4,000 feet, in 1882, by Curtis, one of the collectors of the Messrs. Veitch & Sons, whose name it bears. Plants will thrive if grown in a rough compost of peat and loam, either in well-drained pots or planted out. The winter temperature should not be allowed to fall lower than sixty degrees Fahrenheit, and attention to watering must always be given at this season. In the summer months the atmosphere should be well charged with moisture, which may be accomplished in the usual way of damping the floors and the houses and sides of stages at frequent intervals during the day. Air may also be given liberally during hot weather, when, owing to evaporation, greater quantities of water will naturally be required by the plants.

Isleworth. *J. Weathers.*

Lettuce for Summer and Autumn Use.

DURING the hotter summer and early autumn months, when a fresh, crisp salad is one of the most relishable additions to the breakfast-table we rarely find, either in the private garden or the market, a supply of good lettuce. Yet, wherever the appreciation or demand warrants it, a little extra effort will secure lettuce which is fully equal, and generally superior to that obtainable earlier. The method which we have found successful is the following: Prepare a bed or field of friable well-tilled soil, making it very rich, especially in nitrogenous manures, using very liberal quantities of well-rotted manure and of nitrate of soda. Wet the bed thoroughly and wait until it has dried out, just sufficiently not to pack under pressure, or, in the case of field culture, wait long enough after a rain to secure the same condition, and then sow the seed in drills, two feet apart, running north and south, covering the seed lightly and pressing the soil well over it. Now set along the row, eight feet apart, stakes four to six inches wide, one inch or more thick, and fifteen to eighteen inches long, so that they will project four to six inches above the surface, and on these lay common six-inch fencing boards, tacking them to the stakes with a single wire nail. These will generally shade the rows during the heat of the day sufficiently to secure a stand and a rapid growth. The rows can at least be watered with far less danger of injury than if they were unshaded. When the young plants are two or three inches high, remove the boards, thin out so that there will be from three to ten plants to the yard, according to the age and size when the lettuce is to be used, raise the stakes until they are from eight to ten inches above the surface and replace the boards.

As to the best kinds for summer planting, the European sort, Marvel or Red Besson, and its American representatives, Long Standing Bronze, Shotwell, Brown Head, etc., make a compact plant, deep red in color, with a solid head of thick, rich-flavored, crumpled, yellow leaves of the finest quality, and is one of the best sorts to resist the hot sun.

Deacon, Defiance Summer, New White Russian Summer, if not identical, are very similar, and form solid heads of very thick, rich-flavored leaves—the outer ones a rich green, the inner white, or yellowish white. These are good varieties, especially for those who use oil or butter with lettuce.

Hanson, Henderson's New York, Marblehead, Mammoth Cabbage are all larger and coarser-growing than the others, and the heads are looser, and made of much coarser but exceedingly crisp and tender white leaves, which might be preferred by those who eat lettuce with vinegar and sugar.

Any of the above varieties can be grown so as to be in perfection at any time from July 1st till October 15th, and we think cannot be grown so as to be at their best until about the earlier date; while Tennis Ball, Black Seeded Simpson and some other sorts must be grown so as to mature not later than July 1st, in order to be at their best.

Detroit, Mich. *Will W. Tracy.*

A hardy Indian Azalea.—Some ten or twelve years ago Mr. George C. Woolson imported from Japan some plants which he ordered as *Azalea amœna*, but which proved to be another variety which blossoms very much later, sometimes holding flowers until the middle of July, although its season usually begins soon after the middle of June. It seems in this latitude to be rather less able to withstand the winter than *Azalea amœna*, but this year it has flowered very abundantly. It is a dwarf plant, ranging from twelve to fifteen inches high here, and the flowers are a bright scarlet and as large as those of the typical Indian Azalea. The plant is identified as *Rhododendron Indicum*, var. *obtusum*. It will be a valuable shrub in this latitude and farther south.

Morristown, N. J. *S.*

Hollyhocks.—These favorite old-fashioned flowers have for some time past been at their best, and they are very attractive at the back of a wide border. The Hollyhock disease has done much to discourage growers in this region, where it has prevailed, and therefore success is the more pleasant. We used to have much satisfaction from the named collection of some two dozen varieties, which were mostly Charter's kinds. Some of these Charter Hollyhocks still live, and are well worth growing when they can be obtained. As Hollyhocks come true from seeds, in some sections there would be no difficulty in keeping the varieties year after year. Situated as we are, it is best to obtain fresh seed each year, and start a new lot to secure a good display of stems six to eight feet in height. As perennial plants they are very uncertain in our colder states, and only a part of the crop will survive even the first winter. There are three periods at which seed may be sown with about equal success, the difference being principally in the amount of trouble and space involved. Seed may be sown early in January, and if the plants are grown on without a check they will flower the same year, but the trouble is that a warm greenhouse is indispensable, and so also is plenty of space at a season when space is scarce. Seed may also be sown in March, and the seedlings planted in the open ground in May; they will make strong plants and flower the following year. Plants grown from seed sown in July, or very early in August,

should, when they are large enough, be set out in a bed of rich soil. When cold weather comes the plants should be covered with a few dry leaves and protected by a frame of rough boards. In early spring they may be uncovered and planted in the places where they are to flower. From this method we have had the best results with the least trouble. Hollyhocks like rich soil, and should be watered well in dry weather; strong stakes are necessary to protect them in rough winds. I am not aware that any remedy has been found for the disease, but if there has been, many lovers of these flowers would be glad to know of it.

South Lancaster, Mass. *E. O. Orpet.*

Correspondence.

A Forest Under the Equator.

To the Editor of Garden and Forest:

Sir,—The port of entry to the Amazon Valley is the city of Pará, which stands on the southern bank of the great river, and fears no rival city on the northern bank because that shore is too unhealthy and too difficult of access ever to become inhabited. With never a blighting frost, and with plenty of moisture, for a daily shower is expected to fall throughout the year, it is not strange that every inch of fertile soil under a vertical sun teems with vegetation, so that this little-known city of the south is embowered in a luxuriant forest that sweeps away in every direction as far as the eye can reach, draping the whole land with fadeless green and veiling the face of the continent for 2,000 miles westward to the foot of the Andes.

During the two years in which I lived in Pará many longings for my New England home were alleviated by walks in the narrow forest-paths that terminate the city streets. The landscape is nearly the same at all seasons. Very few of the trees shed all their foliage before the new buds expand, and one leaf at a time falls silently, while others as silently unfold. Few flowers are found blooming freely in the shady recesses of this woodland. Occasionally by the path a solitary scarlet Passion-flower flames like a beacon from the green drapery to which it clings. In partially cleared spaces, or upon the outskirts of the wood, I often saw white Convolvuli, occasionally the purple and white Passion-flower, and also a plant which resembled the scarlet-flowered Canna; the blossom was quite small—perhaps because of the deep shade in which it unfurled its wide green leaves. Many of the trees have small or inconspicuous flowers, but some of the tallest ones open showy clusters of purple or of yellow flowers.

The farther we advance into the forest the less dense becomes the undergrowth, so that one catches more extended glimpses of the vast wilderness that sweeps away on either hand. But it is far from easy to make one's way from one path to another as the tree-trunks are everywhere linked and bound together by gigantic vines or sipos, and you begin to understand what is meant by climbing trees. Their flexible stems twine and creep in every direction or fall in loops strong enough to make a swing for two or three adults. Their leaves are mostly borne when the leaning stems have at last wound their way up to the sunlight that sifts into this dense canopy of foliage which is supported by the columnar trunks of the trees. Underneath this high green firmament the bare, brown, vine-like stems and dark tree-trunks are here and there interspersed with long brown threads that dangle over the pathway and sway with the passing breeze. These woody lianas, suspended from the branches above, are not the ends of vines that have lost hold upon their supports, but they are the air-roots of epiphytal plants that are growing on the interlocking boughs. Some hang like scattered threads of fringe, other strands are clustered, but all are stretching and reaching toward the bosom of the earth, and when they touch the ground they quickly strike their rootlets into the moist soil, no doubt giving new lease of life to the plants lodged on the tree above.

The green leaves of the enormous air-plants or parasites give tone to the grays and browns of the bare trunks, and to the vine-stalks that appear almost sombre in the semi-twilight of the woods. It is a marvelous sight to see wide, flag-like leaves growing luxuriantly in massive clusters at a dizzy height, upon the side of a gigantic tree-trunk. In some strange way many of them have been supplied with a big lump of black soil. One might imagine some grotesque gardener had uptorn the huge root from the ground, and, in some magic way, flung it, with the soil adhering to it, "right side up with care," against its perpendicular perch. Too rank a growth, or some mischievous flying missile may dislodge one, but many are left to cling among Orchids or Ferns, whose home is high on the bark of the tree.

Except in the most moist and densely shaded parts of the forest, the ground is thickly covered with Lycopodiums. They grow a foot or more in height and then bend over, to take root again at their tips, like Walking Ferns. This foot-deep, dark green, mossy cushion is, in itself, worth all the trouble it takes to visit it. In the swampy localities we find Caladiums that are especially graceful in style of growth, and have very brilliant markings. Another plant, whose thick, fleshy and heart-shaped leaves resemble the foliage of the Caladium is the Pothos. These climbing shrubs twine their cord-like stems around the trunks of the trees, here and there emitting false roots, by means of which they attach themselves to the bark of their appropriated support, and clamber on toward the light that filters through interlacing boughs overhead.

An exceedingly interesting study is found in the almost endless variety in the foliage. There is every conceivable form between the fine pinnate leaves of the many Mimosas and the sword-shaped leaves of *Urania Amazonica*, wild Banana, which measure eight feet in length by one in breadth, and stand upright from the top of a five or six foot stem. No words are adequate to express one's admiration for a single one of these stately, colossal trees, and a chill of awe comes with the effort to estimate the number of these giants in the vast forest whose majestic and imposing beauty is the slow and steady growth of unrecorded ages.

Lordsburg, Cal. *Mrs. W. F. Wheeler.*

Community Gardens.

To the Editor of Garden and Forest:

Sir,—The pleasure of gardening would be increased if we were not confined by fashion and custom to a limited number of plants, so that gardens are repeated over and over again. And to make the repetition more marked, not only are the same plants used, but many of them are trimmed and pruned to the same artificial forms. The Rose is indispensable, but its season of bloom is short, and the half-dozen larger Pinks in general cultivation are fine and pleasing. These, with perhaps a dozen other plants, form the staple garden material over considerable sections of the country.

If instead of confining ourselves to a few stock plants, beautiful as they are, there were added to these some of the really attractive flowers which can readily be bought, but which are seldom seen, the garden would have a continuation of bloom and verdure throughout the entire season. There is unlimited variety in the graceful natural effect of shrubs and trees, but the Maple, the Willow and the Poplar are not allowed to assume their natural grace, but are often pollarded or pruned into formality and stiffness, while evergreens are fashioned into even more grotesque forms.

In order to prevent this endless repetition of gardens, each fashioned after the same model, I have a suggestion to offer which may be too fanciful for practical use, but which may perhaps widen the scope of some one's thought or encourage some one to larger enterprise in gardening. What an endless variety of things, little and big, might be grown if a community would organize to grow them. My neighbor A could purchase, plant and enjoy a hundred Sedums, more or less; B could fill his garden with Cactuses; and the Misses C. could cover their two or three hundred feet of rock-margined border with such pretty low plants as the mountain, alpine and spiny Alyssums, the Egyptian and golden Yarrows, the three or four Æthionemas, as many Androsaces, Arabises and Aubrietias, the silvery prostrate and dense Antennarias, *A. dioica* and *A. tomentosa*, the gray-foliaged and white-flowered Cerastiums, the creeping and tufted Astragaluses, the rosy and white-headed Armerias, and even such mild, free and lightly spreading little specimens as our own native *Hosackia Purshiana*, whose claims to garden space I am, I imagine, the first to advocate.

Behind all the above edging species, our friends, the Misses C., could set the more brilliant Figworts, the taller and shorter Mimuluses, Pentstemons, Alonsoas, Antirrhinums, Calceolarias, Nemesias, Linarias, Lophospermums, Digitalises, etc. One entire garden could be filled with the twenty or thirty species of cultivated Oxalis, the advertised twenty or thirty species and varieties of Lobelia and Veronica, with Gypsophilas, Galiums and Statices added to mystify and unite the whole.

The Crucifers, the Pinks, the Pea tribe, the Composites, the succulent Mesembryanthemums, the Night-shades, the bulbous plants would each supply a garden-enclosure with candidates sufficient to fill it.

This plan would afford great variety, with harmony in each individual garden, together with endless diversity, as I have indicated above, in each group of gardens included within the bounds of a civil parish, township or county. Thus arranged, each house-lot, as will be seen, would hold out a continuous invitation to the holders of a thousand other house-lots to come in, examine and admire. Each citizen, with kindest intent, would have large interest in the enclosures of all his neighbors, far and near; consequently, calls and inspections would ever be in order and never completed, as it would take more than one season—more than two, perhaps—to exhaust the green treasures of a single village only.

A township-wide garden, of which each lot-holder would be the owner of a fragment, I offer as a new departure for American gardening.

Santa Clara. *L.*

Recent Publications.

Last year Professor Roberts, of Cornell University, published a bulletin to show how much loss of fertilizing matter occurred when manure was permitted to lie exposed to the weather for considerable periods of time. The trials which were then made have been repeated, with some variations, and on a larger scale, and Bulletin 17, from the Cornell Experiment Station, is devoted to the same subject. In the trial recorded a pile of two tons of horse-manure and cut straw was accumulated in the latter part of April, and analysis was then made of the mass. This remained exposed until the middle of September, when it was carefully scraped up, weighed and analyzed by samples. The season was a wet one, and a great deal of loss occurred. The 4,000 pounds of original gross weight had shrunk to 1,730 pounds, and, although there was an increase in the percentage of phosphoric acid, and but a slight diminution in the percentage of nitrogen, the total loss, owing to the general shrinkage, was very great; that is, of the nitrogen there was a loss of sixty per cent., of phosphoric acid a loss of forty-seven per cent., and of potash a loss of seventy-six per cent. Estimating the value of the fertilizing ingredients at current prices, a ton of the original compost was worth $2.80, while the value of what that ton had dwindled to at the close of the experiment was only $1.06, or a loss of 62 per cent. in the fertilizing power of the manure. The loss in this case was more serious than it was last year, owing to the fact, perhaps, that the heap was larger, and, as it contained some straw, there was a greater degree of heating, or what is known to farmers as firefanging.

A similar experiment was made on a pile of cow-manure, amounting to five tons. The total shrinkage in gross weight was, in this case, about one-half. The loss of nitrogen was forty-one per cent., of phosphoric acid nineteen per cent., and of potash eight per cent., and the value of the manure was depreciated to the amount of about one-third. From this it appears that the waste was only one-half as much as in the case of the horse-manure. One reason for this is, that the fermentation in this case was not sufficiently rapid to cause firefanging.

From these tests Professor Roberts reaches the following conclusion: "It seems safe to say that under the ordinary conditions of piling and exposure the loss of fertilizing material during the course of the summer is not likely to be much below fifty per cent. of the value of the manure." Of course the moral of this is to use great care in preserving such fertilizing material for farm or garden. It is too often the case that farm-yard manures are piled under the eaves of outbuildings or upon a steep hill-side by the borders of a running brook, and this fact is made graphically clear in the bulletin by some pictures from actual photographs of country farm-yards. Professor Roberts recommends cheap buildings or covered yards which will protect the manure from leaching.

Increased interest would have been given to this bulletin if Professor Roberts had explained where the lost fertilizing material had gone. The potash cannot evaporate, so that the potash and phosphoric acid must have been carried away in the drainage. It would seem, therefore, that the best way to save these elements would be to spread the manure at once on the surface of the ground where it was needed, so that the soluble salts might be washed into the soil and held there. The most expensive ingredient, however, is the nitrogen, and in the course of fermentation this can pass into the air as ammonia or as a free gas. It would be interesting to know how much of it escaped in the drainage and how much was dissipated in the air. Fermentation to some extent would go on in the manure even under cover, and in some cases this fermentation adds value to the manure. If Professor Roberts continues his experiments he could give cultivators some useful information by ascertaining for them how much in actual weight a ton of manure would lose if kept under cover or in a pit, and what portion of the waste is material which is valuable plant-food. The proper care and the most effective application of manures may be considered the basis of all good agricultural practice, and our experiment stations can do no better work than by making careful researches in this direction.

Periodical Literature.

In the August number of *The Forum* Ex-Governor Sheldon writes on the Profits of Fruit-culture in California, naming as the fruits which are successfully grown in that state the apple, the apricot, the peach, the pear, the plum, the prune, the nectarine, the cherry, the fig, the olive, the guava, the loquat, the orange, the lemon, the lime, grapes for the table, for raisins and for wines, the English walnut and the almond. The richness of some of the valleys, where the fertility has been washed down from the mountains for ages, is so great, and the consequent production of all kinds of crops is so abundant, that many Californians have been led to believe that this fertility cannot be exhausted. This belief has led to imperfect cultivation and the continuation of successive crops in some places until production has been materially reduced. Vineyards have borne fruit for a hundred years in some cases without any fertilization. The orchards of deciduous fruit are rarely enriched, and Orange-groves have not been fertilized until within ten or fifteen years. Of course, in order to secure future crops, some return must be made to the soil, and cultivators are now beginning to study methods of cultivation and to make use of both home-made and commercial fertilizers with excellent results.

Perhaps the most instructive part of the article is not the general statement of the large production, but the specific examples cited of the crops which have been produced in different parts of the state. For example, 250 acres of wine Grape-vines in Los Angeles County have for several years netted their owner $100 an acre. Raisins yield a profit in four counties of from $150 to $400 an acre when the vines are in full bearing. Walnut-orchards yield from $200 to $400 per acre when the trees are twenty years old. Seventy-two Fig-trees, planted at the rate of 108 to the acre, have netted the grower $600 a year for four years past, and the same grower has received $150 for the lemons grown on one-third of an acre, although they were not cured, but sold to local dealers. The fruit from thirty-eight acres of Peaches, Apricots and Prunes in Pasadena was sold for $9,294, and the cost of production was $1,000, and in the same place the peaches from one and a half acres sold for $500 on the trees. In San Diego County the prunes from five and a half acres brought $2,600, and the cost of production and preparation for market was $300. From sixteen acres of Apricots a grower in Azusa received $7,300 net. One acre of Orange-trees in South Pasadena produced in the fourth year after bearing $350, with a cost of production of $36. Last year a grower in Alhambra raised on eight acres 7,000 boxes of oranges, which were sold at $1.35 a box, while trees planted at the rate of 120 to the acre yield at the rate of $4 a tree. In Riverside, the most celebrated place for orange production in the state, the receipts have been as high as $1,200 to the acre, and $400 and upward are not uncommon returns.

These cases exaggerate general results when the production of all the orchards and vineyards of the state are taken into account, for this includes those which have suffered from neglect and unintelligent management. If these figures are reduced one-half they will still be above the general average production, and then it will be seen that the profits from fruit-culture in California exceed anything that has been achieved elsewhere in the country in horticultural or agricultural production.

The great increase of fruit-production within the last few years has raised the question whether there is not danger of over-production in the early future to such an extent that reduced prices will leave no profits. In proportion to the value of the land and expense of production these profits have been enormous, and prices might be largely reduced before the fruit-industry would cease to be remunerative. But production is still far below the demand. Peaches, for example, are popular all over the country, while the areas where they have been successfully grown are not increasing in the east. Prunes are raised in several parts of California, and yet the state itself imports them largely. Apricots, figs, raisins, walnuts and olives are only grown in a few places except in the southern half of California, and the wine-grape is cultivated in but a few and restricted districts outside of the state. The orange crop

of Florida is practically out of the way before the California fruit is ready for market, and the orange season in California will probably be prolonged in future, since the growers are planting Valencia Oranges, which do not ripen until July. The Lemon is more sensitive to frost than the Orange, therefore it can be grown with less difficulty in California than in Florida.

Beyond question the production of fruit in California will increase out of proportion to the increase of population, but, meantime, fruit is becoming more and more a general necessity, and abundance stimulates efforts to find new markets and extend trade. Millions of people in the United States only occasionally see oranges, and many others do not use fruit as a regular article of food, and since Americans are the greatest consumers in the world, producers, dealers and transporters will exert themselves to place fruits within the reach of all. Probably prices will be reduced in future, but orchards and vineyards will then have reached full-bearing condition, and their yield will be much greater, without corresponding increase in cost of production, and transportation can be materially reduced as tonnage increases. On the whole, Governor Sheldon thinks that, although Californians have large ideas on the subject of profits, and what, in other countries, would be esteemed as princely they are likely to look upon as moderate, and, perhaps, unsatisfactory, nevertheless their ideas can be considerably modified, and prices can be materially reduced and still leave a satisfactory margin of profit. When fruit-culture does become unremunerative it will be time to discourage it, but it is not probable that this period will arrive within the lifetime of the present generation.

Notes.

Elæagnus longipes is proving itself one of the shrubs which thrive well near the sea.

At the imperial Chrysanthemum festivals in Japan one may see single plants bearing from 200 to 400 blossoms each, which are placed in isolated positions of honor and protected by silken tents.

Dr. Dieck recently announced the blooming in his arboretum at Zoeschen, in Germany, of *Robinia Neo-Mexicana* with red flowers. It withstands a cold of twenty-four degrees Reaumur, and "otherwise resembles the blue-green small-leaved form of Robinia Pseudacacia."

A correspondent of the *New York Tribune*, writing recently from Paris, says that it is estimated that the sale of Lilies of the Valley in that city annually amounts to $160,000, vast quantities of the flowers being forced for the winter season as well as brought in from the country in spring.

A writer in the New Bedford *Standard* recently suggested that the Massachusetts Society for the Preservation of Natural Scenery might well acquire that extremity of the Island of Martha's Vineyard which is known as Gay Head, from the brilliant colors of the stratified clay of which this promontory is composed, and which is now threatened with destruction by those who are carrying away its clays and who propose to work its lignite beds.

A favorite sweet in Japan is *midzu ame*, or Millet-honey, made from rice or millet which has been soaked, steamed, mixed with warm water and barley-malt, and left to stand a few hours, when a clear yellow liquid is drawn off which can be boiled down to a thick syrup or paste. This paste street-venders blow into odd forms with a pipe for the delectation of children, and it is also made into fanciful flower-shapes, which are used to decorate the dinner-table, even in the emperor's palace.

Last year we noted the fact that a species of Begonia with tuberous roots, known as *B. Baumanni*, had been collected in South America, with flowers which were agreeably fragrant, and it was suggested that this might enable hybridizers to produce a cross which would have perfume and thus give the final charm to these beautiful flowers. We are not aware that any success in this direction has as yet been achieved, but Mr. Thomas Griffin, who has some 20,000 seedlings of tuberous Begonias growing near Westbury, Long Island, claims that one of his plants bears distinctly fragrant flowers.

The Humboldt *Times* having stated that California Redwood "comes nearer being fire-proof than almost any other material of which buildings are constructed," the *Commercial News*, of San Francisco, replies: "The kindling wood sold by the retail coal and wood dealers of this city is redwood; it is hard to get anything else from them. This ought to prove that the wood is inflammable. That redwood absorbs water like a sponge and that it is free from the resinous quality common to other soft woods enables it to resist fire better than pitch-pine, and once ablaze the flames are more easily extinguished, from the fact that water soaks into the wood. These qualities make redwood valuable as a building material, but it is absurd to speak of the wood as fire-proof."

The Star, of Wilmington, North Carolina, cites the example of Mr. W. H. Dunn, of Newbern, as one who believes in an intensive system of agriculture. He bought sixty acres of land in 1881, paying for it $50 an acre. He values it now at $1,000 an acre, and it has netted, this year, more than twenty per cent. on this valuation. His profits, above all expenses, have been $11,500. He raises everything for which there is a demand in southern markets, but relies mainly on the Irish Potato, with which he finds no danger of overstocking the market. He insists that that man who understands trucking, and knows what to raise, cannot fail to prosper.

Probably the earliest reference to the cultivation of plants under glass occurs in the writings of Columella. He tells us that the Emperor Tiberius, being in ill health, was ordered to eat cucumbers every day. The Roman gardeners, therefore, cultivated them in frames filled with fermenting manure, exposed to the sun at the foot of a wall, mounted on wheels, so that they could be moved about at will, and covered with pieces of talc to protect the vegetables agaist frost and cold. "Thanks to this invention," says Columella, "Tiberius was supplied with cucumbers at nearly every season of the year." Seneca, however, distinctly tells us that Roman hot-houses were heated by artificial means. "Do not those," he protests, "live contrary to nature who require Roses in winter, and who, by the use of hot water and the application of heat, compel the Lily to blossom in winter instead of in the spring?"

The New York *Journal of Commerce* relates this incident to prove that good roads may be a profitable investment: A wealthy prospector, who was looking for a rural home in which to give a safe and pleasant summer outing to a large family of children, returned from a tour of inspection and handed the maps back to the agent who had instigated the quest. When asked about the prospect of a sale he shook his head with a very decided negative. The agent was confounded; would none of the places suit? There was no malaria; there had never been a case of typhus; mosquitoes were unknown; the springs of water were abundant and delicious; the woods waved their leafy boughs in every landscape; the air in each quarter bore on its wings the fragrance of a thousand flowers; what could be the objection? The answer was short and sharp: "There are no drives; I do not own a carriage that would endure for one season on those terrific roads." An unkept highway is worse than the plague to deter investors in rural homes.

A comprehensive study of the influence of forests on the daily variation of air-temperature has been recently made by Professor Müttrich (*Nature*, May 21st), the data being from stations in Germany and Austria. Inter alia, this influence is greater in May to September or October than in the other months. In Pine and Fir woods it rises gradually from January to a maximum in August or September, then falls more quickly to a minimum in December; but in Beech-woods a minimum occurs in April, then there is a quick rise, till the maximum is reached in July. The daily variation itself is greatest in May or June, both in forest and open country. The influence of the forest is to lower the maxima and raise the minima, and the former influence is in most months greater than the latter; in December and January, and occasionally in neighboring months, it is less. The influence on the maxima in summer is greatest in Beech-woods, less in Pine, and least in Fir. The absolute value of the influence in woods of a given kind of tree is affected by the degree of density of the wood, being higher the denser the wood. The character of the climate (oceanic or continental) also affects the results. From daily observations in forest and open country, every two hours in the second half of June, it appears that, soon after five A. M. and eight P. M., the air-temperature in the wood was equal to that in the open; that the maximum was about 0.9° lower in the wood, and the minimum 0.6° higher; that in May to September the difference sometimes reached 2.7°; that the maximum in the wood occurred about half an hour later, and the minimum a quarter of an hour earlier, than in the open; and that the daily mean air-temperature was about one-third of a degree less in the wood.

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The Summer Vacation.

THE summer vacation has come to be an important feature of American life. In a striking article in *The Century* for August Mr. Edward Hungerford shows how it affects the intellectual and material product of the country; how it scatters hoarded money and influences the rate of wages; how it directly improves agriculture and increases the value of land; how it encourages new industries and domestic handicrafts. It may help to solve the problem of abandoned farms, and, on the contrary, it may help to destroy the simplicity which gives to rural life its greatest value and highest charm. This is not the place to discuss social problems of such weight, but it may be said that the country will receive but little moral benefit if it is to be filled with idlers from the town all summer long. Extravagance and love of display is contagious, and they may engender discontent and thriftlessness among those who are brought into daily contact with an army of restless pleasure-seekers. But, after all, the majority of those who seek a change of scene are not of the class who drive four-in-hand. To these people all the year is a vacation from any remunerative work, but the men and women who really need the change from active daily occupation usually bring with them to the fresh country air a wholesome moral atmosphere, and the places they visit profit in every way by their presence. The real trouble is not that they harm others, but that they fail to secure for themselves the highest advantage which their opportunities offer.

For overworked bodies and minds absolute rest may be desirable, but, in spite of all that has been written about the universal nervous exhaustion of our people, the majority of them enter upon their vacation days with minds reasonably alert, and with muscles which long for exercise. To many of them woods and mountains offer few attractions in themselves, and the sea-shore is only inviting when it has drawn together a multitude. It is the crowd and the excitement, and not the ocean's majesty nor the thunder of its surf, which is expected to restore wasted energy. The recuperating force of personal contact with nature is not thought of, and yet, to minds prepared for such communion, its influence is distinctly sanative, and it ministers directly to mental and spiritual health. We may not be able to give the reason for this, but it is a truth as well substantiated as any other in human experience. Great poets and others who give expression to the elemental emotions of the human soul unite in bearing witness to it. In the language of profound thinkers, Nature "soothes and sympathizes," brings "refreshment to the spirits of man," and "pours wine and oil on the smarts of the mind."

It is evident that many of us fail to reap in full measure the advantages of this remedial agency. Indeed, it is often said that only in exceptional instances are Americans sensible of this influence—that is, this inflowing of the spirit of abounding life and multiform beauty of nature with all its transforming and vitalizing energy. Nevertheless, this susceptibility to the charm of natural beauty and grandeur seems to be one of the primary instincts of the race. It may lose its power by lack of exercise, or by indulgence in grosser pleasures; it may be dwarfed by faulty systems of education, or by devotion to what is insincere and artificial in social life, but the faculty is original, and asserts itself wherever men lead natural and wholesome lives. Taking this view of the case, the man who neglects or impairs this power loses more than the mere capacity for one form of pleasurable emotion. He wastes what may be a genuine recuperative energy and inspiration. This is not fancy, but fundamental truth, and these vacation days can hardly be put to better use than to the exercise and development of a faculty which may be so potent to lift us out of the prosaic weariness of work-day life.

Now, this contemplation of Nature on what may be called its imaginative or poetic side differs widely from the mere study of natural science, but it implies some knowledge, and a growing knowledge, of Nature, and science is only knowledge systematized. It is therefore directly in the line of the suggestions already offered to commend to those who have never made the trial the advantages of studious attention to some of the natural objects with which they are brought into daily contact. The essential point is to examine the objects themselves, and not to read about them in books. It will not rob the woodlands of their charm to be able to identify the various species of trees of which they are composed. Indeed, it would seem hardly possible to enjoy them thoroughly without this elementary knowledge, and yet a majority of the men and women we meet can hardly name a dozen of the more common native trees in the forest or the fields, or a dozen of the so-called ornamental trees in parks and gardens. Fewer still can identify the bushes on the road-borders, in the forest-undergrowth or in planted shrubberies. Every one who has directed the attention of a bright boy or girl to efforts in this direction must have observed the eager interest with which each new discovery is made. Trees and shrubs which were formerly passed by unnoted become attractive, every leaf has a new meaning, and even the bark on every tree-trunk becomes a study and a delight. The study, beginning in this small way, may broaden out into fields that are limitless, and may provide wholesome recreation for a life-time. The simple delight in the acquisition of such knowledge is its own reward, but, besides this, it may furnish the mind with an unfailing safeguard in the future against the tedium of many a long journey and lonely hour.

The material for this vacation improvement is always at hand in infinite variety. Any one can begin it with trees or flowers or grass, with birds and their music, or even with the insects or stones, and no one who enters upon such a course of education will fail to find in it so sure

tonic for his mental and moral nature that it is hardly profane to characterize it as a means of grace. It has been objected that a devotion to the study of natural things is liable to become such an absorbing passion as to leave the mind unbalanced, but, in reality, the attitude toward Nature here suggested is the normal and wholesome one; it is the opposite mood, the indifference to Nature and the insensibility to her kindly influences, which is morbid.

New England Parks.

MORTON PARK, PLYMOUTH, MASSACHUSETTS.

THE wish to preserve pleasure-grounds, not only in the neighborhood of the larger cities, but also in the smaller and less-rapidly growing towns, is one of the interesting signs of the times in New England, and it is a taste that may well be cultivated. The Lynn Woods, bordering upon a chain of ponds, and the beautiful Forest Park in Springfield, are charming instances of what Massachusetts is doing outside of her chief city, while the neigborhood of Boston rejoices in many resorts where the toil-worn citizen may find rest and comfort in the shade and refreshment of the woods.

It is appropriate that in Plymouth, which saw the first dawn of New England civilization, such an enterprise should have been undertaken by the citizens and carried to a successful conclusion, so far as organizing upon a substantial and permanent basis goes, while it is still a rural town, scarcely in need of a breathing-space other than is afforded by its own spacious garden-spots and the broad harbor it overlooks, though in securing such a resort it has added another attraction to its already charming quaintness.

The houses of the old town lie huddled together around the Rock, after the fashion of English villages, being planted directly on the street, and climbing the hill, which rises steeply from the bay. The top of the hill is crowned by a most sociable burying ground, which seems to serve as a thoroughfare from one part of Plymouth to another. This sleeping-place of its departed inhabitants is neither mournful nor deserted. Along its convenient walks the pedestrian hurries to his home, carrying bundles under his arm; children play beneath the shadow of the Lindens that overhang the graves of the Pilgrim Fathers, and one may watch a troup of merry girls wandering about the grounds, examining the epitaphs upon the venerable tomb-stones as he sits upon the benches and looks out upon the smiling bay. No dweller in Plymouth ever calls this cemetery anything but "The Hill," which robs it still more of all funereal terror, and to a stranger it is a cheerful spot, from which he may view the sea and look down upon the roofs and towers of the town at his feet.

Descending the hill, old-fashioned gardens full of flowers are to be seen behind the houses, and at its base you come to that time-honored institution, the town brook, which, in some wide reaches, certainly deserves to be dignified by a more imposing title.

Up this historic brook the Pilgrims sailed, to deposit their belongings at a more convenient landing-place than the Rock on which they first set foot, and the traveler of to-day, following its course for a mile or so toward its source, finds himself upon the shores of a lake, apparently so wide and long that the first discoverer deemed it an arm of the bay, and, with a certain grim humor at his expense, the forefathers called it Billington Sea, which name it bears to this day. Lying for a mile along this pond of over three hundred acres in extent, and completely encircling a smaller sheet of water called Little Pond (our ancestors certainly were matter-of-fact in their names), there lies a tract of woodland which is now the Park.

For many years the late Dr. Le Baron Russell had kept about fifty acres of this land open for the use of the public, but some six years ago the only access to the water was by grassy cart-paths through the Oaks and Pines, which brushed the passer-by with their low-sweeping limbs; that approach is now rendered easy and agreeable by well-graded winding roads that lead in all directions through the forest and along the lovely lakes, with openings cut at intervals that give pleasing views of the sparkling water and its farther shores.

This improvement is due largely to the personal exertions of one man who, to a strong affection for the woods, added a fine public spirit for the town, of which his Pilgrim ancestor, whose name he bears, Nathaniel Morton, was a founder.

Encountering obstacles at first, as he who seeks to benefit a community invariably does, Mr. Morton finally succeeded in persuading other citizens of Plymouth to unite with him in inducing the town to acquire, partly by purchase and partly by the acceptance of gifts of land, the property of 150 acres, which, in consideration of his efforts, the townspeople have decided to call Morton Park.

This park still keeps its wild woodland aspect, and it has been the aim of the commissioners to preserve its forest character by making the driveways narrow and permiting the natural shrubs to grow closely along their edges, and to clamber at will through the openings made by the removal of dead or unnecessary timber.

There are few very ancient trees in these woods, most of the Oaks and Maples being coppice-growth from the roots of trees felled some seventy years ago. Such growth, in sandy soil, is not likely to assume large proportions, but it forms the best of shelters for seedlings, which are everywhere springing up among the close-set stems of the parent forest. Where Beeches appear they are encouraged to grow broad and stalwart by making openings for them, gradually removing such trees as interrupt their spread, and letting in air and light by clearing away around them.

In a part of the wood there is a swamp, where are numbers of stately old Red Cedars, and through the wild tangle of shrubs and trees that are engendered by the moist peaty soil a corduroy road is in process of construction, so that one can now walk on planks into the very heart of the forest.

Along the border of the smaller pond are groves of tall Pitch Pines, and between their columnar trunks the water gleams in the distance. White Pines also are found in various places, but the Oak seems to predominate, though there is a good sprinkling of Maple and some planted Canoe Birches and other trees.

On one side of Little Pond rises a hill, wooded to the summit, and playfully called The Mountain, which serves to diversify the generally level character of the grounds, to which, however, the varied views of the two lakes afford endless opportunities for charming effect when the hand of man shall have modified the wild into the picturesque.

The advantage of such a resort is fully appreciated by the townspeople, who frequent the park in great numbers, bringing their boats with them on wheels, or anchoring the smaller ones along the shores of the ponds. Very few restrictions are imposed; the visitor is allowed to gather at will great bunches of the fragrant wild Azalea, which grows here in profusion, or to fill his carriage with the blossoms of the flowering shrubs that load the air with perfume; but the small wild animals and birds are carefully protected in these their native haunts, and no one is permitted to molest or destroy them, so that the wood is full of the sound of their happy voices.

There is a delight in knowing that the enjoyment of this woodland seclusion has become a permanent possession for the dwellers in Plymouth. This provision for the future is a sign of maturity in a nation. In youth, a country, like an individual, is careless and prodigal, apt to waste substance rather than to acquire it; but as advancing years add wisdom and forethought to municipalities as well as man, there comes the wish to secure for the coming generation some of the fast-vanishing youthful pleasures that they remember. The woods in which a man has played when a child he rejoices to retain for the enjoyment of his grandchildren, and to this worthy sentiment we owe the preservation, from the demands of pure utilitarianism, of much that will make the life of future generations rich and beautiful. Could the Pilgrims in their century but have foreseen the joy with which their descendants of to-day would have beheld some surviving monarch of the forests they so ruthlessly destroyed, they might have treasured and protected a few old trees which would now be the glory of the Plymouth Park; but when every trunk might form a shelter for an Indian enemy, small wonder that our anxious sires made haste to clear the region round about them, and left to their descendants the task of raising up again that which it cost them so much labor to destroy.

That the old town of Plymouth should manifest this enthusiasm in so good a cause is a sign that it is still in the van of civilization. Morton Park, with its area of 500 acres of land and water, is an honor to any community, and will yearly become a more valuable possession. Delightful as its wildness and freedom are at present, perfectly as it retains the forest-charm, the growth of new trees, the training of old ones, the gradual opening of other outlooks upon the water, in short, the touch of the intelligent hand will but add to its beauty, and endear it the more to the people.

Hingham, Mass. *M. C. Robbins.*

Tropical Nymphæas in the Open Air at Berlin.

THE tropical Nymphæas, and especially the African species (*N. Lotus*, *N. Zanzibarensis*, etc.), far excel most of the species of cooler climes in the dimensions of their leaves and in the size and colors of their flowers—so much so, that in our colder latitudes lovers of these flowers will sometimes incur considerable expense in supplying them artificially with the conditions of growth which will enable the cultivator to enjoy the full development of their beauty. In some botanic gardens and in the gardens of some rich amateurs we meet with glass houses in which spacious tanks of water are kept constantly warm by means of a powerful heating apparatus, and the interior of these covered aquariums often presents a heightened and more pleasing effect when contrasted with the winter's snow or the summer's drought which may prevail at the time out-of-doors. In somewhat warmer latitudes such an expensive mode of culture is not necessary, and then tanks in the open air, of dimensions proportioned to the size of the plants, and deepest at the centre, take the place of tanks under glass. A few coils of hot-water pipe sunk into the water raise its temperature to the proper degree during the early period of the growth of the plants, while all through the summer the sun's rays, acting on the comparatively small volume of water in the tank, heat it sufficiently to induce and maintain an abundant and continuous bloom on the plants. It is in this way that Mr. E. D. Sturtevant, in the vicinity of New York (that is, in the same latitude as Madrid), successfully grows the fine *Nymphæa Lotus*, *N. scutifolia*, *N. Zanzibarensis*, etc., and the numerous forms of hybrids of the first-named species. Cultivated here under less artificial conditions, these plants seem to harmonize more with the surrounding vegetation, which is quite of a southern type.

But what will your readers say to the astonishing spectacle of tropical Nymphæas growing and flowering in the open air, in pieces of water of some considerable area, and that, too, in the latitude of Berlin? This is a sight which may be seen in the garden of Herr Borsig during many of the summer months. The solution of the riddle (which for a long time has been no secret to many of your readers) is, that an application has been made of the warm water formed by the condensed steam which issues from the machinery workshops of Herr Borsig, which stand close to the garden. The idea of utilizing this condensed steam in raising the temperature of pieces of water first occurred to the grandfather of the present proprietor, who, being a well-informed lover of gardening, made his park, and even his dwelling-house, a centre and museum of the most interesting horticultural collections. A description of all these would occupy too much space here. I shall confine myself to the pieces of water in the park which are filled with Nymphæas. The grounds are about five acres in extent, and are pretty thickly wooded. Through them flows a canal, raised four or five feet above the level of the river Spree, which runs close by. This canal is divided into two or three basins, averaging ninety-seven feet in length and thirty-two feet in width. On the banks handsome trees temper the sunshine, especially about the upper basin, into which the warm water flows, under gentle pressure, through a pipe about as thick as one's wrist, and a few yards in length. Its temperature, on issuing from the pipe, is about seventy-six degrees Fahrenheit, and in the basins from sixty-one to sixty-nine degrees Fahrenheit.

The varieties of Nymphæa grown here are pretty numerous, and have more or less intercrossed with one another. The principal one, both in numbers and effectiveness, is a variety of *N. rubra*, seven or eight strong specimens of which grow in the upper basin. This variety has peltate leaves, brown underneath, and at least sixteen inches across, floating on the surface of the water, and half raised at the centre of the cluster of foliage. The flowers, which stand from six inches to one foot above the water, are of a fine rose color, and more than eight inches in diameter, with very numerous, thin, narrow, limp petals. The characteristics of the plant very much resemble those of another hybrid, which was formerly named *N. Ortgiesiano-rubra*, but are on a much larger scale. *N. rubra*, considered as the type of this species, if it is one, is not so largely developed as the handsome plant of which I have just spoken.

Among the blue-flowered kinds, *N. Zanzibarensis* appears to yield the best results. Its clusters of foliage, which are not so broad as those of *N. rubra*, are more compact, and the leaves are greener in hue. Its handsome flowers remain open only for a few hours every day.

A hybrid between the last-mentioned species and *N. rubra* was pointed out to me. This was still a young plant, but was commencing to flower. Its flowers are of a violet-rose color. *N. scutifolia* does not flower so well as *N. Zanzibarensis*. A variety named *N. cærulea odorata* has quite a pleasing fragrance; it is of vigorous growth and carries its flowers fully sixteen inches above the water. *N. Lotus* has not as yet flowered here, although it produces an abundance of its dentate leaves, which are green underneath.

These Nymphæas remain in the open air for about six months. Toward the month of October the water in the basins is let off into the river Spree, and the rhizomes of the plants are taken up, washed, drained dry and wrapped up in dry moss, after which they are stored under the shelves in a temperate house, where they remain dormant and in good condition during the winter. In the following March a little water is given to them, and they are removed to a house which is slightly heated, where they soon put forth new leaves and later on fresh roots. About the end of April or early in May they are replanted in the basins, each rhizome having a quantity of rich soil or compost placed around it. The warm water is then let into the basins, and these very soon afterward resume the imposing aspect of a river in the tropics.—*Maurice L. de Vilmorin, in Revue Horticole, translated in The Garden.*

The Weeds of California—III.

OF the great Leguminous family only four members can be said to be generally obnoxious to farmers—namely, the Bur Clover (*Medicago denticulata*), the Sweet Clover (*Melilotus Indica*), the Sand Lupin (*L. formosus*, Greene) and the native Licorice (*Glycirrhiza lepidota*). It is true that some of the many native Clovers (Trifolium), though mostly annual, do persist for a while among the grain; but they soon disappear from cultivated fields, and only remain in pasture-grounds, where they are all welcome.

But the Bur Clover, apparently one of the earliest European importations, is of a very different temper. Although an annual, its long, wiry, deep-going roots enable it to survive repeated croppings even unto another season. Under the influence of somewhat generous spring rains, its usually decumbent stems will become assurgent and clothed with luxuriant foliage, forming on the ground a heavy, dense mat, six to ten inches thick, and apparently a most inviting pasture. But its inherent bitter taste prevents any serious damage being done to it by pasturing cattle, which pick the early grasses by preference. Thus the Bur Clover is allowed to mature its coiled pods, armed with hooked bristles, and borne in such abundance that they often form a layer over an inch thick, where the plant, after the cessation of rains, has disappeared before the summer "northers," only a few wiry stems remaining. These burs form a highly important ingredient of the "dry pasture" in the Coast ranges, where cattle get fat on ground that looks to the new-comer as barren as a burnt prairie on the plains. Sheep, of course, also thrive on the pods, but the damage done to the value of their fleece by the inextricable burs is so great that Bur Clover pastures are sedulously avoided by the sheep men.

But during the summer drought this plant changes its nature to suit the altered conditions, and where the ground is cultivated the seed of the same season soon germinates, and a second crop comes up to worry the cultivator. It does not take the insidious little plant long to develop into wheel-shaped mats of all sizes, lying flat on the ground, with minute leaves only, and soon covering themselves with closely packed burs in great profusion. At this time the stems are wiry and tough, and only a very sharp hoe will cut either root or stem. But the seeds acquire germinating power so early that, unless eternal vigilance is exercised, a close mat of young plants will be found in spring where an apparently wretchedly depauperated specimen seemed hardly to maintain life the previous summer. It appears as though the Bur Clover had found in California conditions more favorable to it than anywhere else in the world.

The yellow Melilot also appears to find a most congenial home in all the richer soils where moisture is not too deficient. Thus it grows not only on the banks of brooks and ditches in the Coast ranges as well as in the great valley, but is also found on roadsides and in the cereal fields, completing its growth and fruiting, like the latter, in spring or early summer. Hence, when the cereals are cut for hay the Melilot goes in as a flavoring ingredient to an extent which renders the hay distasteful to horses at least. Worse than this, it is harvested with Wheat, and if left even in the sheaf for any length of time so flavors the grain that the flour made therefrom has a distinct "gingerbread" flavor that is strenuously objected to by millers

both here and in England, and has caused serious discounts upon many a cargo of wheat. Where this plant is mixed with the grain it is very important that the reaping, threshing and winnowing operations should follow each other as quickly as possible; as in practice is done by the "combined harvester and thresher." Even then, if any considerable amount of the seed is left with the grain, the "gingerbread" flavor will gradually communicate itself to the wheat grain and through it to the flour.

The Sand Lupin is naturally at home on deep sandy soils, both in the Coast ranges and in the great valley of California. In these it extends its long, tough root-stocks in all directions, and sometimes forms a mat-work of roots that renders it difficult to keep the plow in the ground. As even short pieces of these root-stocks will sprout, this Lupin—one of the handsomest of its tribe—is a very unwelcome denizen and difficult to extirpate. Its decumbent, assurgent stems form large, low bushes, brilliant with purple flowers, which will shade out every seedling within their reach. In heavier soils it is much more easily dealt with.

The native Licorice shares with the Lupin, as with its Asiatic relative, the possession of long subterranean stems, of which even short pieces will sprout into independent plants. It is especially troublesome in the lighter alluvial soils, in which it finds sufficient moisture throughout the season, and which are its natural habitat. But it gathers fresh strength under cultivation, and if not summarily dealt with when the land is first broken, will be much more difficult to eradicate after the fragments of its root-stocks have been farther disseminated by the plow. Fortunately, it is not as common in California as it is in some parts of Oregon and Washington, where it is known as "Buffalo Brush," and covers large areas almost exclusively.

University of California. *E. W. Hilgard.*

New or Little-known Plants.

The Japanese Photinia.

A FIGURE of one form of this variable plant, cultivated in the Arnold Arboretum, was published in an early issue of Garden and Forest (i., 67, f. 12); the illustration on page 377 represents another inhabitant of the Arboretum which, although very distinct in several minor characters, is believed by those botanists who have had the best opportunities to study the flora of eastern Asia to be only a form of the same plant, *Photinia villosa*, a species in which they include a number of plants very dissimilar in the shape of their leaves, in the character and amount of the pubescence which clothes them, and in the size of their flowers; and which thus considered is widely distributed through Japan and China.

The plant figured in this issue appears identical with one collected by Maximowicz, near Yokohama, during his second journey in Japan, his "forma minor et parviflora" of *Photinia villosa* (see "Mél. Biol.," ix., 176), the *Cratægus lævis* of Thunberg ("Fl. Jap.," 204).

This smooth form of this Photinia was sent to the Arboretum in 1878 by the late Monsieur Lavallé from his Arboretum at Segrez, under the name of *Pourthiæa arguta*, a very different plant, and a native of the warmer parts of the Himalaya. It forms a shrub here six or eight feet high, with slender graceful branches, covered with smooth pale gray bark. The leaves are ovate, usually contracted at the apex into long slender points, finely and sharply serrate, slightly hairy, especially along the midribs on the lower surface and on the short petioles, or often at maturity quite glabrous; they are thin and membranaceous, two and a half to three inches long, an inch and a half broad, and turn bright red in the autumn some time before falling. The white Hawthorn-like flowers are produced in few-flowered, long-stalked, slightly pubescent corymbs, the peduncles and pedicels being covered with lenticels, which are conspicuous on the inflorescence of all the forms of this plant. The flowers appear here about the 1st of June, and are followed late in the autumn by brilliant bright red oblong fruit half an inch, or rather more, in length. This is produced in considerable profusion, four or five fruits sometimes ripening from a single corymb of flowers.

As a garden-shrub the smooth Photinia is, perhaps, less desirable than the stouter pubescent plant, which was figured in the first volume of Garden and Forest. It appears to be of more southern origin, and the ends of the branches are sometimes killed back here in severe winters. The habit is less compact and handsome, and the foliage and flowers are smaller. It is more fruitful, however, and the fruit is more brilliant in color, as is the autumn foliage. Both plants are well worth cultivating, and should be much better known and more often seen in gardens than they are at present. *C. S. S.*

Foreign Correspondence.

London Letter.

Allamanda Williamsii.—Messrs. B. S. Williams & Son, of Holloway, exhibited a plant in flower under this name, at the last meeting of the Horticultural Society, where it received a first-class certificate. In its shrubby habit it is not unlike *A. neriifolia;* indeed, it is said to be a hybrid of this species and *A. Chelsoni*, though this appears to be merely a surmise. *A. cathartica*, as known to botanists, is a very available species, and it includes all those Allamandas known in gardens as *A. Chelsoni*, *A. Hendersoni*, *A. magnifica*, etc. It varies in habit as well as in the size of its flowers, and I think it probable that *A. Williamsii* is merely a form of that species. Compared, however, with garden Allamandas, it is a distinct gain. The stem and leaves are slightly tomentose, and the flowers, which are as large as those of *A. cathartica*, are slightly fragrant. The three well-known types of Allamanda in cultivation are *A. grandiflora*, a really beautiful stove-flowering plant, smaller in leaf and less rambling in habit than the second, namely, *A. cathartica* and its forms. The third is *A. neriifolia*, which is a compact shrub, about two feet high, with flowers two inches across. To these we may now add the purple-flowered *A. violacea*, reintroduced through Kew two years ago, and the new plant now under notice.

Delphinium Zalil.—Flowering examples of this interesting species were exhibited this week by Messrs. Kelway & Son. Owing to what must have been an oversight, the committee of the Royal Horticultural Society awarded it only a botanical certificate, whereas, in its exceptional color, yellow, and in its good garden qualities generally, it fully merited a floral award. We are indebted to Dr. Aitchison, of the Afghan Delimitation Commission, for the discovery and introduction of this plant. It flowered at Kew for the first time in 1889, and was figured in the *Botanical Magazine*, where it was described as forming a great portion of the rolling downs of Badghis, where, when in blossom, it gave a wondrous golden hue to the pastures. Its flowers are borne in erect spikes ten inches long, and they are bright yellow. In the Kew Bulletin for May, 1889, an account of the economic properties of the "Persian Zalil" was published, from which it appears that the flowers are collected largely for exportation for dyeing silk and as a medicine.

Portlandia grandiflora.—This is one of some eight species of Portlandia, all natives of the West Indies or Mexico, and all large-flowered shrubs or trees. The genus is related to the North American *Pinckneya pubens*, which, by the way, is growing nicely in a greenhouse at Kew, as well as in several other English gardens. The Portlandia under notice is now in flower at Kew. It is an erect shrub, one and a half feet high, branched near the top with lanceolate Laurel-like leaves and large, tubular, pure white flowers. In form and size the flowers are very similar to those of *Lilium longiflorum*. Although scarcely known in Europe yet, this Portlandia was introduced into cultivation here more than a century ago. It appears to be a favorite garden-shrub in some of the West Indian Islands. It is easily raised from seeds, and flowers when about five years old.

Lilium Grayi.—This pretty species is now nicely in flower for the first time at Kew. It is growing in a bed

of peat-soil, with *Azalea amœna* for its companion. We attribute the exceptional success with Liliums generally at Kew to this plan of planting them among low-growing shrubs, such as Rhododendrons, Kalmias, Andromedas, etc. *L. Grayi* has stems about eighteen inches high, whorled lanceolate leaves, and solitary nodding flowers, which are small for a Lily, being barely two inches long and almost campanulate. But what they lack in size is more than compensated for in color, the outside of the segments being crimson, while inside they are rich orange-red, thickly blotched and spotted with maroon. A figure of the plant has been prepared for the *Botanical Maga-*

Fig. 62.—Photinia villosa (smooth form).—See page 376.

zine. [It was figured in Garden and Forest, vol. i., p. 19. —Ed.]

Primula Poissoni.—I have already noticed the flowering of this new Chinese Primrose at Kew, and only mention it again for the purpose of drawing attention to its exceptional floriferousness. Unlike its ally, *P. Japonica*, the new one does not flower with a rush, but continues to push up spikes from lateral growths after the first central spike has passed. Thus at Kew plants of *P. Poissoni* have been in flower over two months, and are still gay with bloom. If this species only proves hardy it will be a most valuable plant for the rock-garden, and, even if unable to withstand our winters, it is, nevertheless, a first-rate plant for the conservatory. *P. imperialis* has the same flowering habit as *P. Japonica.*

Spiræa Bumalda, Knap Hill Variety.—This was exhibited recently by Mr. A. Waterer, the Woking nurseryman, and was awarded a first-class certificate by the Royal Horticultural Society. It differs from the type in having flowers of a pleasing shade of pink. Mr. Waterer says it is a most profuse flowering shrub, being covered with bloom just now in his nursery. The shrubby Spiræas do not receive the attention they deserve in England. It would be easy to name a dozen species which for habit and beauty of flowers would compare favorably with the very best of summer-flowering shrubs. Even in the poor sandy soil at Kew the Spiræas are beautiful shrubs, and in rich soils they are much finer still. No plants are more easily accommodated in the garden.

New Peas.—The annual trials of new vegetables and flowers conducted at Chiswick under the superintendence of Mr. F. Barron are of value as affording some indication of the merits of the new things in the market. The Peas selected this year as being of first-rate quality are: Duke of Albany, Telephone, Chelsonian, Tall Green Marrows (Veitch); Extra Dwarf (Carter & Co.); Critic, Essential, Epicure, The Echo (Eckford); Alderman, The Marquis (Laxton); Early Green Marrow, Empress of India (Sutton & Sons); Ameer (Harrison & Sons).

London. *W. Watson.*

Cultural Department.

Stray Notes from the Arnold Arboretum.—VII.

Shrubs which bear handsome and showy fruit in midsummer were briefly discussed in the last issue of these rambling notes. The subject is an interesting one to gardeners, and one full of promise to the student of the beautiful in plants. The list of shrubs which are noticeable at this time on this account is really a surprisingly long one, and every week new beauties are discovered in the shrub-garden, in which handsome fruit is to be seen from now until the first of next April. The most showy plant here now, so far as the fruit is concerned, is the Wayfaring-tree.

Why Wayfaring—

> What ancient claim
> Hast thou to that bright pleasant name?

William Howitt asked long ago in the Book of the Seasons, and no one appears to have found a satisfactory answer. But never mind the English name; the plant is a Viburnum (not a difficult name, certainly, to remember), and its second name, from its old anti-Linnæan appellation, is Lantana. It is a common road-side and wood-side shrub, or small tree, in Europe and western Asia, and has been an inhabitant of gardens as long as any shrub has been cultivated in modern Europe. It has rigid upright-growing branches, which form a mass of rather stiff outline. The flowers are small, creamy white, in dense cymes two or three inches across, and open here very early in the season before those of any other of the Viburnums, with the exception of our native Moose-wood (see Garden and Forest, vol. ii., p. 535). The flowers are not beautiful, although they make an interesting contrast with the developing leaves, which are covered, as are the shoots at that time of the year, with thick, white, mealy down, and which, late in the season, are large, sharply toothed, heart-shaped at the base, pale gray-green, and soft and downy. The fruit, which is dark blue-black when it ripens, passes, like that of a good many of the species of Viburnum, through a red stage, and just now is the very brightest shade of coral-red imaginable, one side of each fruit being often pale and orange-colored. A compact cluster of this brilliantly colored fruit several inches across terminates every branch of a well-grown shrub, for the Wayfaring-tree is exceedingly free with its flowers; and the fruit-clusters contrast well with the dark foliage and produce a beautiful and striking effect not surpassed in showiness by many shrubs when in flower. A good effect can be produced by placing this Viburnum near a *Cornus circinata*, a plant which has already been alluded to in these notes. The fruit of the Cornus, which at maturity is of a dull white color, ripens just at the time when that of the Wayfaring-tree is most brilliant, and if the two plants are side by side, the fruit of the one sets off that of the other; and the beauty of the light green foliage of Cornus appears all the more beautiful as it comes in contrast with the dull dark shades of the large leaves of the Viburnum. This is mentioned merely as an illustration of the fact that plants to be grouped, in a way to bring out all the beauty they are capable of giving us, must be known thoroughly, and that the planter or landscape-gardener, to deserve the name of artist, must study his plants in all their aspects—that is, from one year's end to another, and year after year, until he knows just what each is capable of in a given position and in what manner each must be placed to produce certain effects at certain seasons of the year. But such thoughts as these must not make us forget our Viburnum, which reminds us that another species, the Cranberry Bush, *Viburnum Opulus*, is very beautiful in midsummer, too. Late in the autumn the fruit of this plant, which it produces in abundance, is scarlet, remaining bright and comparatively fresh on the branches until early spring. Now it is a deep orange color, with one red cheek, and beautiful against the rich green foliage. Something of this plant was said in the first number of these notes, but its claims cannot, perhaps, be set forth too often, and it is well to call attention to its midsummer aspect. It is a great plant, but how rarely one sees it in gardens, and yet how few shrubs there are which can boast of beautiful flowers, fruit which is handsome during nine months of every year, vigor and good habit, and a constitution upon which cold, at least the cold of inhabitable regions, makes no impression.

Very handsome just now with its fruit-laden branches is a shrub of which we know very little in this country. This is the *Cotoneaster vulgaris* of Europe, a member of a large genus which has no representative in the flora of this country. It is an irregular-growing, rather sprawling, plant with rigid branches covered with dark reddish bark, small ovate leaves, rarely more than an inch long, coated on the under side, as are the young shoots, with dense white cottony down. The flowers are small, greenish white, and have no ornamental value or significance whatever. But they are followed by bright red apple-like fruit, which, individually, is not large, rarely more than a quarter of an inch across, but which is clustered along the whole length of the branches, which it covers from end to end, almost hiding the leaves, and making a great show. *C. vulgaris* is a very hardy and easily grown plant, but for some reason or other it appears to have escaped attention in this country; in its native land, which is all the colder parts of eastern, central and southern Europe, and central and Russian Asia, it usually, but not always, selects limestone soils; and it is so hardy and vigorous that it grows to the borders of the Arctic Circle and on mountain-sides to the very edge of glaciers.

The Cherry Plum, or Myrobalan, is a handsome object now. This is a small Plum-tree much cultivated in some European countries, with erect rigid branches, and conspicuous in spring from the fact that the flowers do not open until the leaves are about half-grown, an unusual thing among Plum-trees, and one which greatly increases the beauty of the Myrobalan at that season of the year. Indeed, it is one of the most charming of all fruit-trees in the spring, and it is the handsomest, too, of the Plum-trees in fruit, which ripens here earlier than that of the other species. The fruit is globular, or nearly so, and hangs on long slender stems; it is orange on some trees, bright yellow, with a red cheek on others, and as the branches grow upright it hangs down in such a manner that it is not hidden under the leaves, and so makes a conspicuous show in contrast with the foliage, which is dark and rich in color. The well-known purple-leaved Plum (*Prunus Pissardi*) is a variety of this tree, and is beautiful, too, at the flowering time from the contrast of the pure white flowers with the bright red color of the unfolding leaves. The fruit, however, although individually very handsome, is identical in color with the leaves, and therefore is not distinguished except on close examination. The curculio does not appear to

attack the fruit of the Myrobalan here, and the trees are very productive. In Europe the fruit is much esteemed, especially in cooking and for compôts and preserves.

There are other plants in the collection which are handsome this week from their showy fruit, and some which are interesting from their flowers, but the columns of GARDEN AND FOREST are not elastic, as the editor feels obliged to remind me once a week, and the time to bring these notes to a close has already elapsed.

Arnold Arboretum. *P. C.*

High Culture and Tenderness.

A WRITER in the *Weekly Tribune* says: "Mr. H. M. Greeley remarked of Osage-orange, 'Hardy under neglect; tender under high culture. This is true alike of all the fruit-trees and vines we cultivate.'" He then quotes the veteran pomologist, J. J. Thomas, as advising only a moderate growth—say, for an Apple, Pear or Cherry, not less than eight to twelve inches of new terminal growth, and not much more. Excess either way is a sign of impending decay.

All my early instructions in fruit-growing, received in Maine and Massachusetts, agreed with this formula; and when later, in Kentucky, I undertook to surround my garden-farm with an Osage-orange hedge I received the same caution. Later still, in northern Vermont, trying to establish an orchard where all the old settlers insisted that no tree-fruits other than the Siberian Crabs and the native red Plums would survive the hard winters, I tried, but in vain, by following this tradition, to succeed with the hardiest known varieties.

But when, after much discouraging failure, I got hold of the Russian Apples, behold a joyful change! Vermont's winters (with forty degrees below zero no unfrequent experience on Lake Memphremagog) had no power to harm them. In the beginning my land was not very rich; but as I kept on improving it our young orchards of Russian varieties persisted in far outgrowing these standard rules, and I feared the consequences threatened under them. For a while I cut back, though with a new growth yearly of three or four feet I hardly had the courage to retrench it to the extent of the rule. I tried summer pinching; but this resulted in a brushy growth of small branches, which would not do at all.

Seeing no evil resulting where the luxuriant new wood was suffered to remain, I abandoned the practice of cutting back, and limited my pruning to the removal of ill-placed shoots. I have continued this practice now for twenty years; and as I received from year to year various new Russian varieties I have followed it without variation, not only with Apples, but with the Plums, Cherries and Pears of the Budd-Gibb importations, and in every case where the variety has proved a true iron-clad, with unvarying success.

Frequently of late I have been honored by visits from eminent fruit-growers from different sections of the continent; but I need here perhaps only refer to the remarks upon the thrift of my orchards appearing in the notes of Mr. Van Deman in the last report of the Secretary of Agriculture. Some of these visitors have shaken their heads warningly at the free growth allowed, especially with the Russian Pears, one variety of which, Bessemianka, has never made less than three feet growth of its leading shoots, yet not one has suffered the loss of a bud from successive winters exceeding in severity any previous ones in my experience here.

Some of my expert visitors have assured me that I would never get any fruit on these Pear-trees unless I root-pruned them, or otherwise arrested their strong growth. But I had not found such a resort to be necessary with the Russian Apples, nearly all of which, nevertheless, proved early bearers. After six years of such vigorous existence, with a present height of twenty feet, several of my Bessemianka-trees (after blooming fruitlessly the two preceding years) are now carrying quite a respectable crop; and though the curculios, in this plumless year, have defaced the young fruit, I am in good hope that I shall eat my first Russian pear before winter.

Now, what is the lesson to be learned? I think it is that the dictum of moderate growth holds good mainly where the trees in question are not quite hardy. Where the growth of the shoots, however free, becomes early determinate by the maturity of all their buds, their luxuriance does not indicate a likelihood of "impending decay" in the orchard or in the forest. Take the Osage-orange, which in Texas is a large tree, as an illustration. In the Ohio Valley it is far from "iron-clad"—being often badly killed back in winter where its growth is vigorous. About Louisville I have never seen it become a tree of much size, even when grown singly. It is there much the same as with the slightly tender fruit-trees in our northern orchards. In the light of my experience I would never cut back, or restrain by economy of manure, the growth of any fruit or forest-tree that, so treated, survives the hardest winters entirely uninjured. And I am inclined to add, that I would never, or hardly ever, plant any other sorts—certainly not in the "cold north."

Newport, Vt. *T. H. Hoskins.*

Crowded Shrubberies.

CROWDED plantations and shrubberies are far too common, where private grounds are laid out and planted, either by landscape-gardeners or by nurserymen, or by both. What they have to study is, how best to create an immediate effect, at the same time arranging the trees and shrubs, deciduous and evergreen, so that the best of everything should ultimately be left in sole possession. The latter being distributed with due regard to their habit of growth, all intervening spaces are filled in with what may be termed supernumeraries as distinguished from those permanently planted. In many cases, or where carte blanche is given to the planters, comparatively thick planting is practiced, the shrubberies having a well-filled appearance at the outset, and the ground being trenched and otherwise well prepared, the growth of the majority of trees and shrubs is rapid. Before, however, the commoner and more vigorous occupants of these newly formed shrubberies overrun, impoverish, and literally spoil the choicer and more delicate subjects, the thinning out ought to commence, leaving only those originally intended to be permanent. In how many instances is this judicious thinning carried out? Chaos is the word that really describes the state of these neglected plantations. The more robust subjects do certainly manage to hold their own, but even these would have been far more handsome and valuable had they not been obliged to struggle for the supremacy.

There are two ways of getting over this difficulty of thinning out plantations and shrubberies: one, wholesale transplantation, entailing a considerable amount of labor, and often shirked accordingly; and the other the destruction of, in the shape of cutting down or rooting out, much that might well have been saved. If the thinning out was taken in hand before the trees and shrubs had overrun each other, those not required for their present position could be safely transplanted elsewhere, much other effective planting up being done largely with the aid of these thinnings. Forest-trees should be confined to the park or anywhere else well away from shrubbery, flower-garden and kitchen-garden.

Nor would I tolerate the presence of the heavy Scotch Firs and several others of the more dense Pines anywhere near dwelling-houses and shrubberies, where they soon overshadow everything else. Either isolate them or else cut them out. This rule may not be so strictly enforced in the case of various other conifers, but the majority of these even are out of place in mixed shrubberies, being far more effective well clear of everything else in a pinetum or on the turf. Whether only common Firs or choicer species of conifer are used, and whether planted in groups or in long belts, at the outskirts of parks, the same rule holds good as to the necessity for timely thinning out, all the trees being kept well clear of each other, and thus allowed to develop in a natural manner.

Forest-trees and conifers are not the only subjects requiring thinning out. Other strong-growing deciduous trees and shrubs should be restrained, for if allowed to extend as much as they will, the coarse, hungry-rooted kinds completely overrun the borders and monopolize more than their share of head-room. Many of them ought either to be transplanted elsewhere or rooted out, and the least that can be done is to cut them well back, so as to give more valuable shrubs all the room and daylight they require.

If fewer shrubs were planted in the first instance, far more pleasure would, in many instances, be derived from the shrubberies. In this case it would be possible and commendable to intersperse Hollyhocks, Foxgloves, Delphiniums, Sunflowers, masses of Sweet Peas, Lilies, perennial Asters, and many other flowering bulbous-rooted plants, perennials and annuals, among the shrubs, and there would then be something in the flowering line to admire, and, it may be, to cut from, all the year round.—*The Field* (London).

Raspberries in 1891.

THE first red Raspberry to ripen is Thompson's Early. It is a fairly good berry, but I get nothing of marked value from it. In size it about equals good wild berries or Marlboro when not grown in hills. Close after comes one of my own seedlings, a cross of Philadelphia and Cuthbert, a large dark red berry, growing like Philadelphia but much larger. It not

only bears early, but holds on late. The berry carries well, and promises to be valuable. Then comes Marlboro, a good berry if grown in hills or very thin rows and cultivated, but it easily runs wild. With Marlboro comes a second seedling, with stout canes, growing late; it has a large, round, bright scarlet berry. Like the first, this is from a batch of seedlings of Philadelphia and Cuthbert parentage. This berry carries finely, and is handsome. Turner and Philadelphia come quickly after these, and Turner is grand if grown very thin and highly cultivated. The chief trouble is it runs thick and wild and fruitless if it has a chance.

Hansell and Crimson Cluster are worthless with me. They bear a little in the fall, but it is not a crop to desire. They are practically weeds. Lost Rubies lingers about my vineyard, but is not a berry of value. Its real name is in doubt.

Franconia, among yellows, ripens with Turner, but is very soft, and decays quickly. Golden Queen is a fine berry, ripening immediately after Marlboro and before Cuthbert—that is, Golden Queen averages a few days ahead of its brother or its parent. I do not believe it is a sport of Cuthbert, but a seedling of it, such a chance as appears in our fields occasionally. It is a grand berry when there is a market for yellow sorts. But this must be borne in mind, that it neither carries as well as Cuthbert nor is it as good a keeper. I always pick mine at night for next morning's delivery, or, if possible, on the morning of delivery. Cuthbert is the standard for general market purposes, and a really ideal fruit. It will do well on the same ground for ten years or more. It is important that the old canes should be cut close when cut out in October; but it does not injure the Cuthbert to stand close in rows. Mine have for eight years grown in rows only four feet apart.

I prefer taller plants than those usually grown—that is, six feet in preference to four. To be sure, the main crop is high, but the advantages are that the ground is shaded, and in dry weather is kept moist. There is also much advantage to pickers, as a grown person can stand erect most of the time, and be fairly well shaded at that. I have experimented with still higher clipping, but have decided that six feet is about right. The canes are all tied to a wire running from post to post about four feet from the ground. The posts need not be closer than twenty-five feet. Tie four or five canes together below or above the wire—not to or around the wire. I cut out old canes, and tie new ones in October. The old canes may lie for mulch through winter. In the spring they are raked up and burned, and the rows are cultivated and hoed twice. After which plants are left until the crop is gathered.

Schaffer's Colossal is a marvelous fruit, with only one fault, that of color. If scarlet it would hardly be open to any criticism, but it is a purple. The canes always die back somewhat in winter, but the crop comes on most abundant and without fail. This variety yields five baskets to three of Cuthbert and two of Philadelphia. The Rochelle is also purple, and a fine cropper, but not large, and has rusted with me. This year it is excellent.

Of black Raspberries I place Palmer and Souhegan ahead on the hardy list, but Gregg would stand foremost if hardy. I have at least a dozen seedlings that are equals to the choice sorts, and I am in hopes to secure from them a hardy Gregg. Wherever a black Raspberry comes up it is allowed to grow until it shows its quality. Birds sow them very freely. Black Caps cannot be grown for profit unless in connection with an apparatus for drying.

Clinton, N. Y. *E. P. Powell.*

Fig. 63.—Abies lasiocarpa and Tsuga Pattoniana on Mount Ranier, Washington.—See page 382.

The Water Garden.

Sagittaria Montevidensis.—The flowers of this variety are usually described as having a red blotch at the base of the petals, and probably this is the habitual coloring. It seems, however, that the flowers are variable, one of my seedlings producing flowers with no trace of red, but with a lemon-yellow shading at the base of the petals. This Arrowhead is the tallest member of the family, and is very useful where a tropical effect is desired in the water garden. The leaves are scarcely larger than those of a well-grown specimen of our native variety, but they are borne on tapering stalks some four or five feet high and some three inches in diameter at the base. The flowering scapes are also massive, and even longer than the leaf-stalks. The flowers, which are freely produced, are two

inches in diameter, pure white, blotched at the base, and quite fugacious. The female flowers are borne on the lower part of the scape and are larger than the male ones, which occupy the upper portion. *S. Montevidensis* was the first of the family to flower, possibly, however, because, being a tender species, it had been kept in warmth and had some start of the other varieties, whose tubers, though probably hardy, were wintered in a cool cellar. Plants of this variety are readily grown from seed, and they will flower the first season if sown early. It is necessary for their germination that the seed-pans be kept in strong heat, and soil slightly covered with water. Arrowheads usually make numerous tubers and increase rapidly.

Myriophyllum heterophyllum (Water Milfoil) is a plant usually grown in aquariums, but it proves very satisfactory and free-growing in the water garden. The leaves are very small, finely cut, and arranged in whorls on long creeping stalks. A mass of this plant is very attractive and distinct. It proves hardy in this locality.

Aponogeton distachyon.—The fragrant peculiar bracts of this plant have a certain attraction, and the plant is a good grower, but the brown tips of the anthers are unpleasantly suggestive of aphides, and aphides are one of the minor afflictions of water plants. Amateurs are not inclined to dwell much on the subject of drawbacks to the culture of favorite plants, but a full discussion of all such points is sometimes of more importance to a beginner than glowing accounts of perfect culture with drawbacks unnoticed. The aphides which affect aquatic plants are as black as the flies so well known to the Chrysanthemum grower. During the present abnormally dry season they have been unusually abundant. Fortunately, if looked to in time, they do very little injury. Various concoctions are recommended for their suppression, but the most simple and usually effective plan to get rid of them is to wash them into the water by spray from a hose or syringe, when the fish and frogs soon dispose of them. Fish and frogs are, of course, a necessity to the garden. Gold-fish may be classed among "reliably hardy" subjects; my stock was frozen solidly in the ice last winter and thawed out as lively as ever. Even in my small tank these fish multiply, and the small fry just now are very numerous.

Elizabeth, N. J. *J. N. Gerard.*

Orchid Notes.

Anguloa Ruckeri.—This South American species was introduced about 1845, and it is one of the best in the genus. The smooth, dark green pseudo-bulbs are oblong-ovate, from four to six inches high, bearing at the apex three or four plaited, pale green leaves of light texture, eighteen to twenty-four inches long by five or six inches broad at their widest part. The stout scapes, more than half the length of the leaves, proceed from the base of the previous year's pseudo-bulbs, and are well furnished with conspicuous green sheaths. Each scape carries a single flower, which bears some resemblance to a slightly compressed tulip, the longest diameter measuring two inches, the shortest half an inch less. The parts are all of thick, fleshy substance; sepals and petals oval, dull orange-yellow, with a profusion of crimson spots on the inner surface; lip trilobed, deep-crimson; column white, with occasional streaks of yellow and numerous rose-colored spots. The plant has a bold, striking aspect, and blooms regularly and freely in June and July, the flowers lasting several weeks. It thrives best at the cool end of an intermediate house, in a well-drained pot containing coarse peat-fibre which is covered with sphagnum. Repot early in spring, keeping the pseudo-bulbs an inch or two above the rim of the pot. This plant should never be allowed to become quite dry at the roots, and it requires a free supply of water during the season of growth.

Brassia verrucosa.—It has been said that the Brassias are not worth growing. This may be true of some of the species, but it is certainly too sweeping with *B. verrucosa* and its fine variety, *B. verrucosa grandiflora*, in view. The species is an elegant plant, introduced from Mexico in 1838. The compressed, ovate, channeled pseudo-bulbs are from two to three inches high, bearing two dark green, strap-shaped leaves, from nine to eighteen inches long, at the top, and two shorter ones at the base. The raceme, springing from the base, attains a length of two feet, and bears ten to twenty flowers, distichously arranged on the upper two-thirds of its length. Sepals about three inches long, tapering to a point, greenish white, with purplish spots; petals half the length of sepals, and of similar form and color; lip shorter than petals, spreading into a cordate tip, white, with numerous warty excrescences of greenish color. The plant is of free growth, flowering profusely in June and July. It should be grown in pots or pans in an intermediate temperature, using ample drainage with fibrous peat and sphagnum. It should be potted immediately after the flowering season, and watered copiously during growth, with a slightly restricted supply afterward. The variety resembles the species, but, as its name implies, has larger flowers, and is of a more vigorous character generally. Both plants will be found useful where it is difficult to command a high range of temperature, and, for Orchids, they require but a small amount of attention when once established.

Saccolabium curvifolium.—This is a charming little East Indian species, seldom exceeding nine inches in height. The pale green, two-ranked, linear leaves are about six inches long and beautifully arched. The flowers are borne in neatly arranged erect racemes, which equal the leaves in length; they are of a showy reddish color, with reddish purple column and short yellow spur. It usually blooms early in June, and the flowers are freely produced and retain their vivid hue for quite a long time. Altogether it is a fascinating little plant, and one which well deserves a place in every garden. It requires a high stove temperature and abundant moisture when in active growth, but a lower degree of heat and less water when at rest. A well-drained basket and a little peat, the whole covered with clean sphagnum, are the best materials for the roots. There is a variety of this plant, *S. curvifolium luteum*, which occasionally finds its way to those gardens in which Orchids are the most conspicuous feature. It is rarely offered for sale, however, and differs from the species in the attractive yellow color of the flowers.

Botanical Gardens, Cambridge, Mass. *M. Barker.*

Lindera sericea.—Many plants of the Laurel family are known for the strong odors which are intensified in their essential oils, and *Lindera sericea*, which is a member of this family, has this characteristic. The plant has long been known to the Japanese for its aromatic properties. The wood has been largely used for tooth-picks, which are known to preserve their odor for a long time. The plant is a deciduous shrub, chiefly found among the mountains south-east of Tokio, in the provinces of Idzu and Sagami. The bark, which is brownish black when old, is the most odorous part of the wood. The cheerful tender green of its leaves makes it worthy of cultivation in any garden, although the panicle of flowers, which is produced in early summer, is quite insignificant. When the plant is pruned the fragrance emitted can be observed at a considerable distance. Three kinds of essence have been prepared from this plant by a friend of mine, Mr. Takatori; they range in color from light orange to pale green, a diversity due to the varying purity of the oil. It has a spicy and burning taste, and an aromatic odor which, to me, resembles the oil of turpentine and cinnamon. No doubt, this oil would have a high commercial value for use in perfumery and in soap. It is already so used to some extent in Japan.

College of Agriculture, Komaba, Tokio, Japan. *H. Yoshida.*

[The letter from Professor Yoshida contained some leaves of the Lindera and a small fragment of Japanese paper which had been moistened with the oil. Notwithstanding its long journey, the odor from the paper was still pungent, and suggested the peculiar fragrance of our native Spice-bush, *Lindera Benzoin.*—Ed.]

The Forest.

Some Points in Practical Forestry.

In an interesting review, by Dr. Brandis, of Dr. Schlich's "Manual of Forestry," published in a recent number of *Nature*, attention is called to the fact that this book was prepared by the author primarily for the use of the students at the Cooper's Hill Forest School in England. That school was established seven years ago, in connection with the Royal Indian Engineering College, in order to give the needed professional training to young Englishmen who desired to enter the Indian Forest Department. When the first volume of this handbook appeared some persons, who took a deep interest in the progress of forestry in the British Indian Empire, were surprised that it did not deal with Indian trees, but that its teachings were illustrated by the Oak, the Beech, the Scotch Pine and other trees of Europe,

and the book was, therefore, pronounced by them a failure. But the principles of silviculture are the same everywhere, and the application of these principles to the treatment of different woods in different parts of the globe will lead to the adoption of similar methods; and, therefore, according to Dr. Brandis, the author of the manual was right in selecting the timber trees of Europe to illustrate these principles and the practice based upon them, because these trees are at hand for example, and because the systematic treatment of European forests is of long standing, and has endured the test of experience, while the methodical care of Indian forests is not more than thirty-five years old. As an interesting example of the way in which similar practices have developed in the rearing and tending of woods in Europe and in India we quote the following parallel from Dr. Brandis' review:

In a loop of the Main River, in Lower Franconia, east of Aschaffenburg, rises an extensive mountainous country, clothed with almost unbroken forest of singular beauty and of enormous value. It is the Spessart, in old times known as the home and haunt of great highway robbers, but also known from time immemorial as the home of the best Oak timber in Germany. The red sandstone of the Trias, which everywhere is the underlying rock in this extensive forest-country, makes a light sandy loam, which, where deep, is capable of producing tall, cylindrical, well-shaped stems. Having grown up, while young, in a densely crowded wood, the Oak here has cleared itself of side branches at an early age. Hence these clean straight stems which, in the case of Spruce, Silver Fir and other forest-trees, may justly be said to be the rule, but which the Oak does not produce, save under these and similarly favorable circumstances. The species here is *Quercus sessiliflora;* this species does not form pure forests, but is always found mixed with other trees, the Hornbeam, the Beech, and on the lower slopes of the western Schwarzwald, the Silver Fir. In the Spessart, the Beech is associated with the Oak in the same manner as the Bamboo is the chief associate of the Teak-tree in Burma.

The principles which guide the forester in the proper treatment of his woods are the same in India as in Europe. In the Teak-forests of Burma the Bamboo has a position similar to that of the Beech in the Oak-forests of the Spessart. Oak and Teak are both trees with comparatively light foliage. Pure woods of these species, while young, are sufficiently dense to shade the ground, whereas at an advanced age the wood gets thin, the canopy light, and the result is that grass and weeds appear, and that by the action of sun and wind the soil hardens and is less fertile than the loose porous soil, which is shaded by dense masses of foliage. Hence the advantage of associates, which, like the Beech in Europe and the Bamboo in Burma, shade the ground with their dense foliage, and enrich it by the abundant fall of their leaves. But it is not only the condition of the ground which is improved by these useful associates. Teak and Oak have this specialty also in common, that, when growing up alone, their stems, instead of running up into clean cylindrical boles, are apt to throw out side branches, which greatly impair the market value of the log. But when growing up in dense masses with their natural associates, these latter, crowding in as they do on all sides around the Oak in the Spessart and the Teak in Burma, prevent the development of side branches, and thus produce clean and regularly shaped stems.

In these and many other ways are the associates of the Teak and of the Oak useful friends, so to speak. Under certain circumstances, however, and at certain periods of their life, they are dangerous enemies to their more valuable companions. On the sandstone of the Spessart, and elsewhere, the Beech, as a rule, has a more vigorous growth than the Oak; it gets the upper hand, and, unless it is cut back or thinned out in time, the Oak, if both are growing up in an even mixture, has no chance. The Bamboo is even more formidable as an enemy of the young Teak-tree. Though the Teak may have had a long start, if a crop of Bamboos—either the shoots of old rhizomes, or, perhaps, the result of general seeding of the old Bamboo-forest, cleared away to make room for the Teak—springs up among it, the Teak is doomed. As soon as the rhizomes of the Bamboo have acquired sufficient strength they produce, within a few weeks, during the rains, such a profusion of full-sized shoots, say twenty to thirty feet high, that the young Teak-trees among them are throttled and extinguished.

The similarity in the relations of Teak and Bamboo in Burma, and of Oak and Beech in the Spessart, has led foresters in both countries to devise similar arrangements for the regeneration of these forests. In the Spessart, when the old timber in a compartment of the forest is cut, the best places for the growth of the Oak are selected, and the Oak, which here sells at the rate of from two shillings to three shillings a cubic foot for sound and well-shaped pieces, is sown on soil most suitable for its development; while the Beech, the timber of which only fetches about one-fifth of that amount, is allowed to reproduce naturally from self-sown seedlings over the rest of the area. Among the Oak also a certain but small proportion of Beech springs up, and even where pure Oak woods may be the result of these proceedings, it will not be difficult, when they are sufficiently advanced, to introduce such a proportion of Beech as will secure their satisfactory development. In the same way in Burma, selected areas are cleared for the growth of Teak in the original forest, the clearance being effected, and the Teak planted, with the aid of that rude mode of shifting cultivation, known as the Toungya system.

Correspondence.

Conifers on Mount Ranier.

To the Editor of Garden and Forest:

Sir,—I send you a view of a group of trees on the south side of Mount Ranier (see page 380). The tallest is a fine specimen of the Mountain Hemlock, *Tsuga Pattoniana*, and the trees which surround it are *Abies lasiocarpa* (*subalpina*). A few notes on this last, as it appears on Mount Ranier, may be interesting.

Abies lasiocarpa occurs on Mount Ranier at altitudes varying from 5,000 up to nearly 8,000 feet. At 5,000 feet it parts company with its two near relatives, *Abies nobilis* and *Abies amabilis;* and from this elevation up it is invariably accompanied by the Mountain Hemlock, and less frequently by the Nootka Cypress, *Chamæcyparis Nutkaensis*. At 6,000 feet *Abies lasiocarpa* is in all its glory; at 7,000 feet and over it spreads on the ground in great mats still accompanied by *Tsuga Pattoniana*, and occasionally by *Pinus albicaulis*. Only one conifer, the little alpine Juniper, grows at higher elevations than *A. lasiocarpa* on Mount Ranier.

The illustration represents a small grove at 6,000 feet altitude. These groves occupy only the drier ridges, and frequently are very symmetrical in outline. Nothing in the forests of Washington can equal them in beauty, and one never tires of admiring the vivid light green color of *Abies lasiocarpa*, which is made still more beautiful by contrast with the sombre hues of the Mountain Hemlock. The interior branches of these groves are literally festooned with lichens, and this, together with their pitchiness, renders these trees exceedingly inflammable.

Several Pine-groves on Mount Ranier have been destroyed by fire, and, to any lover of trees, their tall dead trunks make a mute, although forcible, appeal for greater care.

Seattle, Washington. *Charles V. Piper.*

[Our correspondent's discovery of *Abies nobilis* on Mount Ranier extends the northern range of this species, not known before north of the Columbia River, very considerably; and his observations show that on this mountain as large a number of coniferous trees of the north-west are aggregated as in any other one locality. Very possibly there is no other mountain on which the four north-western Firs—*A. amabilis*, *A. nobilis*, *A. lasiocarpa* and *A. grandis*—are growing.—Ed.]

The Destruction of California Wild Flowers.

To the Editor of Garden and Forest:

Sir,—The extensive floral decorations which are a general feature of private and public entertainments in San Francisco were formerly committed to florists. More recently professional decorators are employed, who draw as much as possible on the wild plants of the California forests and cañons, instead of buying garden-grown blossoms. Many of the great cañons and mountain-slopes, wooded with Oaks, Madrones, Pines and a great variety of smaller growth, are within a few hours' journey from San Francisco. The professional decorator can easily hire men for two dollars a day and car fare, who will bring back immense loads of Ferns, wild Violets, Rhododendron-branches, and whatever has happened to strike the fancy of the hour. Properly worked up, with perhaps a small ex-

penditure for cultivated flowers, this wealth of greenery and woodland bloom in the the hands of skillful decorators is very charming.

On the Oakland ferry-boat, a few days ago, I first noticed one of the sad results of the fashion for decorating with wild flowers. There were large baskets full of False Solomon's Seal (*Smilacina amplexicaulis*) that gives so much beauty to many a ravine of the Coast range. The plants had been uprooted in every instance. I began to investigate, and soon discovered that few, except coarse and common plants, are left in the cañons near the bay, and the Ferns have disappeared from places within three or four hours' travel. In many counties public sentiment is becoming ready for a law that shall adequately protect certain wild plants of California.

In the case of *Smilacina amplexicaulis* all that is needed to preserve it is reasonable care in cutting. Like the allied species, *S. sessifolia*, it grows from a hardy and stout root-stock. If this is undisturbed and a few leaves left, the plant will thrive for years and furnish large quantities of its graceful foliage. Among the Ferns that are disappearing from our cañons are *Adiantum emarginatum* and *A. pedatum*, *Pellæa andromedæfolia* and *P. Ornithopus*, and *Gymnogramme triangularis*. Even the Woodwardia (*W. radicans*), which was once so abundant, is in danger of extinction in many districts of the state. The coarse bracken Fern, *Pteris aquilina*, forms dense thickets acres in extent in the northern counties of Humboldt, Klamath and Siskiyou, and is a troublesome weed in garden and field. But no other Fern appears safe, and such delicate species as *Cheilanthes Californica*, the Aspleniums, and others that have always been rare, are threatened with extermination.

The careless ravages of picnic parties and tourists have disturbed thoughtful people, but it is only the showy annuals and such things as readily recover which are gathered by this class. Eschscholtzias and Larkspurs are nearly as numerous in the Marin County pastures this summer as they were twenty years ago. Berkeley cañons are still brilliant with flowers, and there are miles of rose-hued wild Currants along Strawberry Creek. But the Trilliums, that used to grow by thousands in shady places under the Oaks, are becoming scarce. All the finer bulbous-rooted plants are fast disappearing, not so much because a few careless young people wander into the woods, but because of the ravages of the hired men of the professional decorator.

Private ownership of land has not prevented the gathering of wild plants, because California is full of large ranches, and many of its wilder cañons—the sheltered haunts that the shy wild plants love best—are so unfit for cultivation that they remain unfenced and unprotected. Thousands of pounds of "green stuff," as the vandals call their spoils, may be gathered and carried off without hindrance. I know of perhaps half a dozen small cañons that are fenced and well guarded during the season, and in one or two cases there is even some replanting and wild-gardening done. For the most part the land-owners have not awakened to the situation. When they do, the native plants will receive, at least, as much care and protection as do the quail and other game. Signs like these will then perhaps be seen scattered along our ravines: "Use scissors on Ferns and other small plants"; "Do not break or trample"; "Leave some flowers of annuals for seed."

A story was recently told to me by a lady who had just returned from camping in the Yosemite Valley. A friendly guide, when asked about the Ferns of the region, answered that he would have to know her a long time before he would be willing to tell her about the kinds in the valley, and continued: "I know you don't mean any harm, but there was a young woman here from the Bay—a great botanist—and I told her of a Fern that only grew in two places, so far as I knew, in the whole region. Then she was wild to see it. I told her she might have some leaves to press in her brown-paper books, but warned her not to pull up any. 'Don't you s'pose I know better than to spoil your Fern-garden?' replied the college girl. So I showed her where the stuff grew—one place, where the most of it was, under some dry brush I had put there—and I made her promise again not to tell any one, and not to pull it up. I said to her, 'I guess there ain't but two clumps of it in the Yosemite, and my idea is it ought to stay here. It would be a kind of murder to drive it out.' Then she looked real pretty, and said she entirely agreed with me. It might be a new species, she remarked, and it might be named after me if I would let it be taken away, but then I was exactly right, and it belonged right here.

"Two or three weeks after that her camp broke up, and she went up the valley and dug up every root of the Fern that she could find. Fact. I saw her doing it. When I went down to camp to tell them good-by, that cussed little hypocrite sidled up and begged me to take good care of the Ferns—specially of that new kind! No, mum, I'll show you everything in the line of plants, from the Merced River to the top of El Capitan, except one little bunch of Fern—all that was left by that young woman from the Bay."

Niles, Cal. *Charles Howard Shinn.*

Recent Publications.

The Cauliflower. By A. A. Crozier. The Register Publishing Co., Ann Arbor, Michigan.

In most gardens of the United States the Cauliflower is considered an uncertain vegetable. This is due to the fact that American gardeners are not well acquainted with the methods of cultivation suited to our climate and with the best modern varieties of the plant; and yet such varieties can, as a rule, be grown with success wherever the soil and climate is particularly suited to the Cabbage. The fall crop is to be relied upon mainly here, for it will be waste of effort to grow Cauliflowers when they head in the heat of our summers, and, although the time may come when we can have Cauliflower and Broccoli here as they do in England the year round, as yet it is only under the most favorable circumstances that it pays to do much even with a spring crop of these plants.

Mr. Crozier has prepared a manual which he has endeavored to adapt to the different conditions found within the limits of the United States. He has laid down rules for cultivation, but he has explained how they must be adjusted to suit the different localities. The directions are minute, but, at the same time, the grower is cautioned against following them implicitly, and he is advised to make personal experiments after he has gained some general information, so that he can determine for himself the details of the cultural methods required by his soil and exposure. The book opens with a brief chapter on the Origin and History of the Cauliflower, and this is followed by a sketch of the Cauliflower industry both in Europe and the United States. Under the head of the "Management of the Crop" will be found the most important information for cultivators relating to soil, fertilizers, transplanting, cultivating, harvesting and marketing, and the chapter entitled "Cauliflower Regions" gives the records of experience from growers on the upper Atlantic coast, the lake region, the prairie region, the south, and on the Pacific coast, all of which will be found of special interest for each locality. The chapter on Varieties is very complete, and the sections devoted to the insect and fungal enemies of the plant contains the most recent information as to approved methods of fighting all these pests.

Altogether, Mr. Crozier has furnished an excellent handbook on the subject, and one which will prove of great help to any one who is beginning to cultivate the Cauliflower for market purposes, and Professor Goff, of the Wisconsin Experiment Station, is quoted as saying, "I incline to think that there is a fortune in store for the energetic young man who finds a favorable locality for growing this vegetable near any one of our large cities, and who will make a specialty of the work." It may be well to add a recapitulation of the points which are important in Cauliflower culture, according to Mr. Crozier: (1) The best localities for Cauliflower are those where the climate is cool and moist, as, for example, near some large body of water. (2) The Cauliflower will endure nearly as much dry weather as ordinary crops while growing, provided it has a cool, moist time in which to head. (3) The best soil is a sandy loam, though any cool, moist, fertile soil will answer. (4) While a moist soil is desirable, thorough drainage is essential. (5) An abundance of manure is necessary, as the Cauliflower is a gross feeder. (6) Frequent tillage is needed, that there may be no check in the growth of the plants until they are ready to head. (7) The leaves should be tied over the heads, as soon as they appear, to keep them blanched and protected from frost. (8) If any plants have failed to head on the approach of winter they should be removed to a shed or cellar and they will head there.

Notes.

According to the New York *Sun*, "Sod No. 14, in the Central Park grass-garden, has made the best growth of any of the sixteen varieties set out last spring. It is a close and fine variety of Rhode Island Bent-grass. A bit five inches square has developed into something like a square yard of thick velvety turf."

As is well known, the chief source of the vanilla of commerce is an orchidaceous plant, *Vanilla aromatica*. But a

substance identical in its qualities has been procured from other sources also, as from Beet-sugar, Asparagus, Asafœtida and the ashes of Olive-wood; and it is now stated in the *Illustrirte Gartenzeitung*, of Vienna, that the seeds of *Rosa canina* contain it in such large quantities that they will soon "rival the Vanilla-bean in the trade."

In the last number of *The American Florist* Mr. Edwin Lonsdale comments on the fact that there are so few clear yellow flowers among the new sorts of dwarf French Cannas, and so many which are spotted and freckled. Mr. Lonsdale truly remarks that the public taste favors self-colors, and he wisely counsels the raisers of new Cannas to turn their attention to the production of such varieties.

We have received from the American Economic Association Part Three of the sixth volume of their publications. This contains the papers by Mr. Gifford Pinchot, Mr. Edward A. Bowers, and Mr. B. E. Fernow, which were read last winter before the American Forestry Association. All three of these essays will be found to have great interest and value to every one who is giving any thought to the subject of Forestry in America.

We have observed that the hybrid Clematises are blooming with remarkable freedom in many places this year, and a photograph of a specimen of *Clematis Jackmanni*, on the grounds of Mr. Charles Mead, of Goshen, New York, has been sent to this office, which shows a remarkable plant. It spreads over a trellis more than twenty feet high and almost as wide, and seems literally covered with large and perfectly formed flowers.

To show the abundance of oranges in Paraguay, Mr. Theodore Childs, writing recently in *Harper's Magazine*, cites the case of a plantation owned by an Englishman where there are 20,000 Orange-trees, but for want of means of transportation the fruit has no market value. "Under the trees the oranges lie on the ground a foot deep, and the cattle eat them and fatten well." As the people have oranges in this abundance and a plenty of mandioca, too, "they need not work, and they will not work."

The published programme of the meeting of the Society of American Florists, to be held in Toronto next week, shows that the subjects to be discussed are of the highest practical interest. The different members of the Committee on Nomenclature, each of whom is giving attention to a particular flower, have been actively at work, and there is promise that much good will be done in the way of bringing about something like uniformity of names in the catalogues of garden-plants in commerce.

In an article on "American Roses," published in the *Illustrirte Gartenzeitung* for July, it is stated that "the possibility of growing Roses so that cut flowers may be had from them at all seasons of the year is the result of American methods of culture"; and that "thus far the Americans have, in all, produced thirty new Roses." These are then named and described at considerable length. The article concludes by saying that "as Waban is the last in our list of American Roses, so it will probably prove, with The Bride, to be the best of them all."

As to the connection between the density of timber and the rapidity of growth, Dr. Schlich, in his manual, states that in the case of broad-leaved species, which have the pores in the spring-portion of the wood, a large annual growth, indicated by wide rings, shows high quality; and narrow rings show low quality. It is probable that the same rule holds good for species which have the pores distributed uniformly over the ring. In conifers, however, the reverse is the case, broad rings representing inferior quality and narrow rings the opposite.

The *Gardeners' Chronicle* recently announced that a Rose with variegated leaves has been obtained from a branch of the Charles Lefebvre Rose, the foliage of which was richly marked with golden spots, and, when young, was of bronze color with a carmine tinge. In commenting upon this novelty a German journal says that it will "meet a deeply felt need"; but all true lovers of Roses and all those who have a keen sense of what constitutes beauty and harmony in a plant will continue, we think, to prefer Rose-trees with old-fashioned foliage of simple green.

A few shrubs which flower abundantly early in the season have the merit of producing blooms occasionally all summer long. There is hardly a day from early June until frost comes, for example, when a well-grown specimen of *Rhodotypus kerrioides* will not give a few sprays with a single flower at their extremities. The pure white blossom among the light green leaves is very attractive, and a half-dozen of these sprays will help to add lightness and grace to a vase of the highly colored flowers which usually prevail at this season. It is also a point in favor of *Rosa rugosa* that, even in this hot August weather, it is rarely altogether without bloom.

The twenty-third biennial session of the American Pomological Society will begin at the hall of the National Museum, in the city of Washington, on the 22d of September, at 10 A.M., and will continue for three days. The preliminary programme shows that more than the usual attention will be given to scientific pomology, while the commercial aspects of fruit-growing will by no means be neglected. Judging from the titles of the essays and the standing of the men who are to prepare them, it may be safely predicted that the meeting will be one of more than ordinary interest. The society offers no premiums, but there will be an exhibition, as usual, and the Wilder medals will be awarded to fruits of special merit.

It has been for many years a current newspaper item that one of our well-known weeds, the Mullein, is a common garden ornament in Europe, where it is called the American Velvet Plant. The same statement has been recently made in an article in one of our leading magazines; but the fact is, that our way-side Mullein grows as commonly by European way-sides as by our own, and any traveler can see it from the windows of his railway carriage without searching for it in gardens. Further than this, it is not an American plant at all, but one of those exotics which followed the white man across the sea, and has now become firmly established here. A reference to Gray's Manual will show that, although it is now a common weed, it is said to be naturalized from Europe.

An interesting feature of the methods by which Paris is so profusely supplied with flowers at all seasons of the year is the localization of their culture. Almost all the Azaleas come from Versailles; Neuilly is devoted to Lilies-of-the-Valley, Fontenay to Roses, and Fontenay-sous-bois to Parma Violets (which are also grown at Clamart and Verrières in large quantities) and to Cinerarias and Chinese Primroses. From Vitry-sur-Seine come chiefly Lilacs, and Roses from Jory, Bourg-la-Reine and Brie Comte Robert, while Montreuil, famous for its peaches, also produces Camellias, Gardenias, Narcissuses, Hyacinths, Hydrangeas and Cyclamens. Between 400 and 500 gardeners give themselves up to supplying the Paris trade, and at Vitry, in addition to twenty gardeners who cultivate Lilacs, there are ten who make a specialty of Orchids, fifteen who grow Ferns, and one who grows Orange-flowers only.

A report on the cultivation of Sisal Hemp in the United States, made by Mr. Charles Richard Dodge as special agent, has just been published under the authority of the Secretary of Agriculture. It has been proved beyond question that the Sisal Hemp-plant will grow in this country, for it was introduced into Florida more than fifty years ago, and it is now growing wild in many portions of that state. Much is to be learned, however, concerning the growth of the plant and the best means of extracting the fibre, and this report, which embodies a very thorough investigation regarding the industry in general, seems to be a timely one. More than 60,000 tons of this hemp, amounting in value to some $10,000,000, have been imported into this country during the last two years, and this does not include the imported articles manufactured from the hemp, which are considerable. The hemp is used in America largely for the manufacture of rope, binding-twine and similar cordage, and is regarded as one of the most valuable of the commercial fibres.

Mr. J. J. Thomas, in the *Country Gentleman*, remarks that the Baldwin, which once stood far above all other winter apples for marketing, has lately failed in western New York. It is not improbable that the trees of this variety may again bear abundantly, and yet, although successful apple-growers must depend in the main on a few varieties, every grower should have a knowledge of a more extended list. It is a good plan, therefore, to select a dozen or twenty kinds for a trial orchard, which in a few years will give its owner the information he wants. Mr. Thomas gives the following list of Apples which are easily procured of reliable nurserymen, and with which he thinks every one who grows apples should be acquainted: Baker, Belmont, Buckingham, Canada Reinette, Chenango Strawberry, Cogswell, Cole's Quince, Danver's Sweet, Dyer, Evening Party, Fanny, Grimes' Golden, Lawyer, McIntosh Red, Mother, Richard's Graft, Smokehouse, Shiawasse, Shockley, Sutton, Wealthy, and such common varieties as Peck's Pleasant, Jonathan, Lowell, Hubbardston and many others.

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Architectural Fitness.

AMERICANS are gradually learning that fitness, appropriateness, is the foundation of all artistic excellence, and, though the lesson is not yet fully acquired, we are making visible progress toward the realization of this quality in our various classes of buildings. The improvement is perhaps most manifest in our country houses, which we design with a more intelligent regard for the requirements of site and environment than we did even ten years ago, and a truer sense of the fact that in such houses simplicity is a cardinal virtue. There has been a reaction against conventionality on the one hand, and against ostentation on the other, and it has been inspired by a new-born feeling for architectural fitness.

But in a reaction men are almost certain to go too far, and so it is not surprising to find that in trying for simplicity we sometimes fall into rudeness. This shows, of course, that we have not fully understood the meaning of fitness as an architectural term; we have remembered that a structure should harmonize with its surroundings, but have forgotten that it should also harmonize with the ideas of cultivated men and women who are the heirs of all the ages, living in a state of superior enlightenment, and inheriting the practical processes as well as the tastes of countless generations of skillful builders. Moreover, in thus trying to express part of the significance of the word fitness, we may miss true simplicity; for civilized, intelligent men can produce rude-looking structures only by an effort so deliberate and self-conscious that it lays them open to the charge of affectation.

We cannot object to an Adirondack camp or a fishing-lodge or a hill-side studio, be it ever so rough and rude. It is designed as a shelter in a semi-savage sort of existence, and may be as appropriate to the temporary needs and pursuits of its inhabitants as to the wild scenes amid which it stands. But when costly buildings in civilized neighborhoods are built for permanent use in imitation of the materials and methods naturally adopted for temporary homes in the wilderness, it may be questioned whether the interests of true simplicity, or of true appropriateness, are subserved.

The tendency to which we have referred finds many illustrations in the use of boulders, or roughly cut stones, in constructions which should wear a refined and dignified aspect, as well as a simple one. Undoubtedly, this practice has been largely inspired by the example of Richardson. An architect so original, strong and skillful as he could not fail to influence profoundly the general course of his art; and, as with every great master, this influence has been partly for good, partly for evil. Few other buildings in this country, and certainly no other small building, have excited so much attention, been so often described, pictured and discussed as the gardener's lodge which he built, of huge rough boulders, in the village of North Easton, near Boston. It is, indeed, a picturesque and interesting piece of work, but it has certainly been imitated in ways which Richardson never anticipated, and he would have been distressed by a sight of some of the progeny it has engendered.

In certain places and for certain purposes the use of boulders, whether large or small, is not only allowable, but praiseworthy. It is both sensible and appropriate to use them, for example, in the foundations or the basement of a country house on land where they abound and can be had at little cost and trouble. But even in such spots as this it is seldom desirable that whole houses should be built of them, for we do not want an American country home to wear the aspect at once rude, unrefined and ponderous, which their sole employment gives.

In other parts of New England one may wisely use, instead of boulders and for a similar purpose, stones roughly split from neighboring granite-ledges; but, again, and for the same reasons, it is seldom wise thus to construct a whole house. We want simplicity and we want solidity, but we do not want coarseness or the affectation of simplicity. A house with an interior such as every American demands, made comfortable by a hundred ingenious devices and beautiful by the skilled work of a score of different artisans, should have an exterior of consonant expression; and rough-hewn stones or roughly cemented boulders cannot give this expression.

But it is not only in private country homes that our methods of using stone are frequently erroneous. Country churches and public buildings, and even the most ambitious city structures, are often open to criticism in this respect. Even in urban parks the effort to adapt the architectural work to rural surroundings may be a departure from genuine simplicity. A park is one of the most complicated and refined of the artistic creations of mankind; and its beauty and unity may be impaired if any feature of man's creating does not show the same kind and degree of skill and refinement as the others that surround it. A park must depend for the most part upon nature for its charm, but it must also conspicuously depend upon art; and it is trite to say that when art is set to work its activity should be frankly and clearly confessed. No matter how rural in character a park may be, or how pure and undisturbed the sylvan charm of some of its remoter parts, there is no place where the work of man ought to be done with greater skill, more perfect finish, or (using the term in its best sense) a franker artificiality. Almost all such work is done in this manner in all our parks. Their driveways are not constructed like country roads of even the better sort; their lawns are not left like fields to a growth of untended grass; nor are their shrubberies allowed to grow in the wild luxuriance so beautiful beside a rural highway. When the engineer and the horticulturist are thus showing the highest level to which modern science and art have attained, the architect should work in a spirit similar to theirs. Structures which look rough, casual, almost barbaric and affectedly simple are not appropriate in a carefully tended pleasure-ground,

planted with exotic trees and flowers and bisected by scientifically built and neatly curbed roads, even though we may know that as much thought and as much pains, of a certain kind, have been expended on their construction as though the outcome were more clearly artistic and refined.

The Central Park was laid out before the modern taste for boulders and rough-hewn stones had developed, and in it one may well study the method of treating architectural features in such a place. Here and there, in quiet corners and shady nooks, we find rough little flights of steps and rustic summer-houses of unhewn wood; but in all conspicuous places, and for all important constructions, work of a more polished and elegant sort is employed. But in the new Franklin Park at Boston, for example, there are structures in the most conspicuous situations which would seem more appropriate in a woody glen a hundred miles from any town. A drinking-fountain, carefully built of jagged stones so that it looks as if carelessly thrown together for a temporary purpose, may have a beauty of its own, but whether it is fitly placed beside the principal building, and near the principal driveway of an urban park, is open to question. Steps of rude slabs, scarcely revealing the use of the chisel, hardly seem appropriate in contact with the accurately shaped and smoothed curbing of this drive. In building the gateways at the principal entrance to this beautiful pleasure-ground it seems to have been the artist's purpose to make them inconspicuous, and thus disturb as little as possible the rural effect of the outlook over the distant country. But the existence of gateways, and their eminently artificial character, cannot really be disguised; and to build them wholly of small boulders sacrifices beauty and appropriateness to an unattainable end. A comparison of these gateways with those recently erected at one of the southern entrances to Prospect Park, in Brooklyn, would prove, we think, that the more confessedly artistic a work of art is made the better is its effect in such a situation. And at Prospect Park the low marble seats, small classic-looking shelters and graceful piers, interfere no more with the prospect than the rugged-looking seats and shelters at Franklin Park.

Of still more doubtful propriety is the use of unhewn stones in the construction of bridges. It seems contrary to the primary canons of art that an arch should have voussoirs of irregular shape and different lengths, so that, instead of seeming strong and homogeneous, they appear to be sliding past one another. Yet many rustic bridges have been erected in this fashion. How Richardson thought a bridge in a park ought to be built is shown by the one over which Boylston Street crosses the Fens in Boston. It is entirely devoid of ornament, perfectly simple; but with its wide, graceful, yet vigorous sweep, its beautifully modeled buttresses and coping, and the carefully finished surface of its stones, it is as true and refined and as noteworthy a work of art as any of the more elaborate things he ever built. Not far away now stands another bridge of three arches, built in the prevalent "natural" manner. In general design it is very good, and were its fabric as architectural and its finish as perfect as those of Richardson's bridge, the two would form a most happy contrast. But it looks weak despite its actual solidity, and careless despite the careful study unquestionably bestowed upon it, while its curtain of vines is not, we think, a fortunate substitute for an architectural balustrade in a work of art designed for a place which will soon be in the heart of a great city. In structures such as these we seem to be trying to go back to the infancy of art, but such efforts can hardly result in true simplicity or true appropriateness to modern tastes, conditions and abilities.

We invite attention to a letter from Mr. Charles Eliot in another column of this paper. Referring to Mr. Baxter's project for a Massachusetts forest, Mr. Eliot suggests the creation of a general Board of Commissioners who can act for all the cities and towns which are comprised in Greater Boston. It is generally admitted that, as this large and populous district becomes still more densely inhabited, there will be need for many more open spaces for recreation-grounds and breathing-places. As the case now stands, each of the municipalities can select grounds within its own limits, but where this is done the action must necessarily be controlled by purely local considerations. In many cases the most favorable grounds to be selected would extend across one or more of these town or city boundaries, and unless something like united action can be secured on a plan which embraces within its scope the entire area in question, there is little hope that a sufficient number of plots will be reserved, or that these plots will be the best ones for the purpose they are intended to fulfill.

It is very plain that co-operation is an absolute necessity in a case like this. This principle is one with which our people should become familiarized, for it is capable of a much wider application. Wherever forests need to be reserved at the sources of rivers the importance of co-operation by different states is apparent. Such rivers as the Connecticut, the Merrimac and the Ohio, whose head-waters are in the highlands of different states, can never be adequately protected unless all these states unite upon some general plan of forest-preservation. The board suggested by Mr. Eliot might therefore prove of value not only immediately to the eastern part of Massachusetts, but it might set an example which could be followed to advantage on a much more comprehensive scale throughout the country.

The Seeding of the Bamboo.

The hardier species of Bamboo are becoming deservedly more popular year by year for the adornment of English pleasure-grounds. One thing, however, seems not unlikely to be lost sight of, namely, the fact that the culms of the Bamboo flower but once, the plant perishing immediately after the ripening of the seed. After flowering and seeding, when the plants have reached the climax of their grace and beauty, no art of the gardener can stay their death. It would be, I imagine, almost impossible to determine the age at which these hardy Bamboos will produce flowers when grown in this country; most probably the term of years will differ with the various species.

With regard to the great Bamboo of tropical India, *Bambusa arundinacea*, it is a well-ascertained fact, that the coming to maturity of this gigantic Grass only occurs after a growth of some fifty years' duration; and the phenomenon of its flowering, seeding and subsequent death in India and other climes—where it covers with its huge and picturesque clumps many square miles of country—is an extraordinary spectacle which can have been seen but by few Englishmen of the present generation.

It is unnecessary to give any lengthy description of the plant; suffice it to say, that in the locality in India where I had the rare fortune of witnessing the flowering and seeding of this gigantic Grass on a large scale, the culms frequently attain a height of from sixty to seventy feet, and a diameter at their thickest part of from eight to ten inches. These culms are furnished with lateral branches, throughout their whole length adorned with a profusion of light green leaves. The plant is deciduous, shedding its leaves in India during the dry season, and renewing them on the approach of the spring showers. The clumps present the apppearance of colossal plumes of feathers, and when seen in full leaf are beautiful beyond description.

The soil of the tract of country the Bamboo affects in south India is mostly shallow, with a gritty, ferruginous subsoil, and it is not found where the rainfall is excessive. When the clumps are in full vigor, the culms are produced of the above dimensions with amazing rapidity.

It was during the years 1863–1864, while engaged in Coffee-planting in the district of Wynaad, in the province of Malabar, that I witnessed the phenomenon of the seeding of *Bambusa arundinacea*. The plantation I had charge of at the time was situated in the midst of an extensive Bamboo jungle within but a short distance of the frontier of Mysore, and on the main road from the Malabar coast to Seringapatam and Bangalore. At the time of my arrival in the district, the magnificent Bam-

boo-forest, interspersed with such deciduous hard-wooded trees as Teak, Kino, Rose and Sandal-woods, and others of an equally valuable description, was, although unknown to me at the time, upon the eve of a sudden and wonderful transformation. Hundreds of square miles thickly covered with the exquisitely graceful clumps of the Bamboo, giving to the landscape as far as the eye could reach a beauty difficult to describe, were to be changed by fire in the brief period of a little over a year into a charred and blackened wilderness. The myriads of nodding plumes that for half a century had graced the woodlands were, at the call of Nature, to blossom, yield their seed, and disappear from the face of the earth as by the breath of a destroying angel.

The south-west monsoon rains of 1863 had ceased about the middle of September, and left the jungle tracts of Malabar in the very heyday of their glorious greenery. The Bamboo-plumes waved to and fro by the gentle breezes which still prevailed from the westward and glistened in the light of a tropical sun, as yet showing no trace of the change they were so soon to undergo. As the season advanced, hot parching winds from the east began to take the place of the more kindly breezes from the west, and by Christmas the leaves of the Bamboo thickly covered the ground. Simultaneously with the disappearance of the leaves from the laterals, the inflorescence began to appear, and the aspect of the country in every direction changed as if by magic. No one was prepared for such an eventuality, and the English planters in the district were struck with something akin to alarm when the fact dawned upon them that, in the course of a very brief period, not a living Bamboo would be left in the forest. A few there were who refused to believe that the culms would perish after ripening their seeds, and were only persuaded by the actual realization of the fact. As nearly as I can remember, the seed was matured by the middle of May, the panicles of grain weighing down the culms to a third of their length, and giving them withal a graceful as well as fruitful appearace. When the seed, which was about the size and had much the appearance of small oats, had fully matured, it fell to the ground in showers by every passing breeze, and then came a happy season for both man and bird. Sea-fowl, spur-fowl, partridge, jungle-fowl and quail, with which the jungles abounded, reveled in and fattened upon the plentiful supply of good food so suddenly bestowed upon them by the hand of Nature, and man himself was not slow to take advantage of the offering. The coolies from Mysore employed on the Coffee-plantations could with difficulty be induced to remain steadily at work during this Bamboo harvest, and the jungle tribes could not be persuaded to work at all, but subsisted solely on the fallen grain of the Bamboo so long as any could be gathered from the ground. This seed they appeared to highly value, and it seemed to be very nutritious. The grain was ground into meal by the aid of small hand-mills, and baked in the form of cakes, or boiled into a thick porridge. I myself ate the cakes on several occasions, and found them fairly palatable. These jungle tribes, although perfectly aware of the value of the vast granary thus laid at their feet, were, notwithstanding, improvident to a degree. They ate abundantly of the fruit while it lay on the ground, but made no provision against the approaching destruction of the whole by jungle-fires. So, after these had licked the ground, they had, perforce, to return to work on the Coffee-plantations. At the height of the dry season, and when the earth was thickly covered with a coating of Bamboo-leaves and seed, these fires began to do their work, and apparently so completely, that it was hard to believe that a single Bamboo-seed could have escaped destruction, and that in the course of a decade or so, another such magnificent Bamboo-forest could be produced. But Nature in some mysterious way was equal to the occasion, and before I left India, in 1877, the Bamboo zone of Malabar and Mysore was clothed with another jungle, consisting of clumps approaching in size and grandeur those that perished in 1863.

From the date of the seeding of the Bamboo the clumps stood throughout the following monsoon leafless and dead, but intact; it was not till nearly a year after that their complete destruction by fire began. When the dead and sapless clumps caught light the whole country was filled with flame and smoke for weeks together; loud reports were heard night and day without intermission, resulting from the pent-up gases within the hollow culms, and the whole Bamboo zone, so picturesque and beautiful but a twelvemonth before, was quickly reduced to a scene of desolation. The total destruction of the clumps, however, was not accomplished in one season, many escaping the fires till the second, and some till the third.

The young seedlings soon began to appear, but made slow progress for several years. As time went on the annual growth of culms waxed stouter and stouter, till at last a thick undergrowth of low Bamboo tufts covered the ground, which, in the fullness of time, began to send up gigantic canes, till the forest was restored to its former strength and beauty.

With reference to the period of time required for the maturation of *Bambusa arundinacea*, I was at some little trouble, while in India, to ascertain from the native tribes inhabiting the jungles of the district the approximate duration of its existence, and was told by several men, apparently about sixty years of age, living widely apart, that they remembered a similar phenomenon of the seeding of the whole of the Bamboos of the district when they were boys. From this I concluded that about fifty years was the limit to the life of this giant species of Bambusa.

About three months before the flowering of the Bamboo I had occasion to clear some thirty or forty acres of land for the purpose of Coffee-planting, the culms of the Bamboo being cut close to the ground. I waited patiently, curious to know the result of such an operation. When the monsoon rains began the huge stools left in the ground began at once to send up numerous small culms of from eight to ten feet in height, and furnished with laterals. On the cessation of the rains these immediately flowered and seeded, after which the old stools perished absolutely, so that the act of cutting down the original culms had only the effect of delaying, not frustrating, Nature in her efforts at reproduction.—*J. Lowrie, in the Gardeners' Chronicle.*

How We Renewed an Old Place.

XVI.—THE BLESSING OF THE RAIN.

A KINDLY critic has remonstrated with me for setting flowering plants around the trees, as contrary to good rules. I freely admit the fact, but in extenuation of the fault would urge that for the first year or two the bare polls of the trees, cut in till they were not much better than scrubbing-brushes, were so ugly that I wanted to distract people's attention from them. Moreover, the Geraniums and Heliotropes and Nasturtiums were handy for watering and plucking, facts worthy of consideration in a region of dry, hot summers, so that I was tempted, like my mother Eve before me, into willful sin.

Unlike the fault of our first parents, however, my fall from grace is not permanent. The trees have taken it upon themselves to correct the error in taste by taking all the nutriment away from the flowers and by spreading out their branches until the beds are too shaded to furnish blossoms. This summer the cold June has added to their other discomforts, and the day of flower-beds in the neighborhood of the trees is ended. Should these last do their duty this year as they promise, they will be far enough along for us to permit the grass to grow close up to their trunks, which will greatly improve the beauty of the lawn, and the natural look of the trees themselves, which began to make their best growth about the first of July, after they had reaped the full benefit of the heavy rains of later June and were rid of the rose-bugs.

Refreshing, indeed, was the long storm that succeeded the burning days, and it was a joy to see the thirsty grass and plants drinking in life with every drop. I am convinced that the true way to render yourself indifferent to inclement weather in the country is to plant trees. No rain can ever hurt them, and, when they are freshly set out, each shower is a satisfaction to their owner, for it seems as if they could be seen to grow under its kindly influence, and thus a day or week of hard rain, instead of a weariness, becomes a positive delight. I am not sure that this would bring compensation to the young for having to forego their active pleasures, but the more I become interested in gardening the more I am convinced that it is the appropriate pleasure for middle life and old age.

Youth hates to wait for anything, and wishes to realize its dreams so soon as they are conceived; but as we advance in years we take a sober satisfaction in waiting a little for our pleasures, and also we like something that can recur, and that is interminable. Most other delights once experienced are exhausted, but gardening grows by what it feeds on. It is the same, and yet never the same; it can be forever renewed; it can be indefinitely extended; it is within the reach of all dwellers in the country, where home amusements are most needed. It can be compassed by the slenderest purse, and it will give a man a chance to spend a fortune if he so desire. It has its agreeable economies, and its fascinating extravagances. It can be made to satisfy the most orderly dispositions, and also return beauty and grace from careless and wild

arrangements. It can be utilitarian and lucrative, it can be merely æsthetic and ornamental, or all four, just as the fancy takes you. In fact, it may be briefly characterized as Happiness for the million with no patent on it.

Added to all these charms is its wholesomeness, its absorbing character, and, best of all, a certain humanness about the occupation that brings one into pleasant relations with all sorts of people, and affords one a topic of conversation and a meeting-ground, even where he is limited to the most unpromising companions. The village crone forgets her gossip when you talk to her about her Rose-bushes or her last new Geranium slip; the rustic waxes eloquent over the merits of a new potato or a way of protecting melons, and you find yourself always interested and instructed, instead of bored, since almost any one you meet in the country can tell you something you are glad to know, or else he is eager to learn what you are doing yourself, which is a sure way to afford you entertainment, since every man is happy when allowed to ride his own hobby. All of which has a connection with rain, however little obvious it may be, since the moral of my discourse is, that when one becomes, not only resigned to rain but glad of it, he has taken a step toward true philosophy.

A garden after a shower has always an especial charm; everything is sweeter and fresher, even in its often bedraggled condition. I have a passion for dabbling in water-coloring of this description, and cannot keep my hands from the weeds and flowers when I venture forth to see how my favorites have borne the storm. It is a delight to put one's arms about a bouncing pæony, with its red cheeks all cold and dripping, and tie a string around it to keep its bright faces clean. The forward flowers kiss you as you struggle to encircle them; the wet leaves box your ears as if you were taking a liberty. It is some time before you can accomplish your purpose, and you arise from the encounter quite breathless and dripping, with the pink and white faces, huddled up together, all laughing at your condition.

It is June, and the last of the Fleur-de-lis are quite broken down, their pearly petals draggled in mud and defaced by water. This delicate French beauty will put up with no plebeian contact, but withers and dies if brought in contact with the earth. The Roses stand up, after their bath, quite fresh and shining, but the buds, which are so blighted by a heavy rain that they do not open afterward, remind me of the Austrian violinist who greatly admired an English beauty, but confided to a friend his reason for not offering to marry her:

"She vould *vash* me, and I should die."

Many things are broken down and require tying up. If the rain has continued for several days the chickweeds are rampant and overrun everything. New plants that have been on the anxious seat during the dry weather have decided to stay, and are putting forth satisfactory leaves.

The joyful Pear-trees shake their drops down upon you, the cat-bird sits on the grape trellis and inquires what you are doing there. It is a way he has. He lives in the box arbor and thinks he owns the earth, and that our strawberries are his. He scolds the cat and defies the robin, and has such a trig, gentlemanly air about him, with his well-brushed dark coat, that one might christen him Sir Charles Grandison. He makes me a bow and says civil things (or uncivil) in his own tougue, which, unfortunately, I do not understand.

"I thought you told me this parrot could talk?"

"So he can—ze parrot lankwich—you don't expect all ze lankwiches for ten tollar, do you?"

Thus our cat-bird, which costs us nothing but strawberries, discourses in a jargon which we would fain comprehend, so as to answer him according to his deserts; and sometimes of a Sunday morning he sings us a glorious tune.

When the rain comes, Apollo, the parrot, climbs to the top of the tree in which he is perched and spreads all his bright feathers to catch the shower. Elongating his wings, he makes them meet over his brow in the very altitude of the cherubim, and there, turning a somersault, he hangs head downward, that the water may thoroughly drench his plumage. With all his gold and red and green glittering with rain-drops, he resembles some superb blossom quivering on a stem, and makes a beautiful spectacle of himself. When his bath is done he chatters and laughs with glee, and sings his merriest song, with some disregard of rhythm and tune, but none of harmony, till all the smaller birds begin to pipe in company.

The dusty foliage emerges brilliantly shining and fresh. Every shower seems to bring a new spring, and the world never fails to be surprised at the renovation which succeeds the rain. There seem, indeed, to be new heavens and a new earth. The drooping evergreens lift up their tasseled heads and take courage; to them it means life and new hope. The vines throw out their tendrils, and the Honeysuckle emits a keener perfume. The white Lilies that come to rejoice us just as the Roses are going, gleam in the twilight, tall and fair. Who is it that says that it is a figure of the poets to mingle Roses and Lilies, since they do not blossom at the same time? With us the Irises and the white Flower de Luce linger till after the Roses are in bloom, and then, before the Queen is wholly out of sight, come these stately princesses, her followers, like train-bearers of high degree, all clad in white and gold, nearest the throne, if not rivals for the highest place of all. Is it the thorns that make the Rose the royal flower by rendering her difficult of access and surrounding her with a body-guard of lances? Who shall say? There are moods in which her sumptuous beauty and heavy fragrance seem less regal than the haughty, willowy grace of her rival flower, and we hesitate to choose.

And not the flowers alone rejoice in the life-giving drops, but the "sweet smale grass," refreshed and strengthened, lifts its green blades like the spear-heads of a rising army. The dusty mantle that has veiled its gentle beauty falls from it, and the wonderful variation of its tints again delights the eye. Those artists who set our teeth on edge with verdigris and arsenic floods, to represent this dearest and homeliest garment of our mother earth, seem to me never to have entered into and possessed its secret, the secret of myriad shadows, of myriad lights, each catching a reflection from its neighbor blade, the brown earth below, the azure sky above. No greenest green of foliage or meadow ever shocks the most sensitive vision, for Nature, truest of painters, never fails to break her colors with such subtle mixtures that only the utmost training of eye and hand enables the artist to hint her secret upon canvas; and he who, with a palette of crude pigments of raw primary colors, seeks to render the shifting emerald of spring, the topaz of the new-mown field, or the golden harvest, is as one who would catch the flash of the diamond or the burning heart of the ruby on the brush's point and think to imprison it forever.

There are some lines of Matthew Arnold that a wet garden always brings to mind, in which the poet has truly caught the spirit of the fragrant scene. None but a frequenter and true lover of gardens could in a few words have thus pictured the mingled dismay and hope with which one views his garden-plot after a rain has both distressed and refreshed it:

So, some tempestuous morn in early June,
When the year's primal burst of bloom is o'er,
Before the roses and the longest day—
When garden-walks, and all the grassy floor
With blossoms, red and white, of fallen May,
And Chestnut-flowers are strewn—
So have I heard the cuckoo's parting cry,
From the wet field through the vext garden trees
Come, with the volleying rain and tossing breeze;
The bloom is gone, and with the bloom go I!

Too quick despairer, wherefore wilt thou go?
Soon will the high Midsummer pomps come on,
Soon will the musk carnations break and swell,
Soon shall we have gold-dusted snapdragon,
Sweet-william with his homely cottage smell,
And stocks in fragrant blow;
Roses that down the alleys shine afar,
And open, jasmine-muffled lattices,
And groups under the dreaming garden trees,
And the full moon, and the white evening star.

Hingham, Mass. *M. C. Robbins.*

New or Little-known Plants.

New Orchids.

Ada Lehmanni, Rolfe.—A new species of Ada, originally introduced from New Granada by Mr. F. C. Lehmann, German Consul to the Republic of Columbia, after whom it is named. It has been in cultivation for some time. It is readily distinguishable from the well-known *A. aurantiaca* by its more rigid habit, shorter, broader and darker green leaves, which are mottled with gray, and by its white lip. It usually flowers during the summer, while the old species is well known as a winter-flowering plant.—*Gardeners' Chronicle*, July 11th, p. 34.

Catasetum atratum, Lindl., ♂ and ♀.—The female only of this species can claim to be a new garden Orchid, as the male has been known for many years. A very interesting case of the production of flowers of both sexes on the same raceme has occurred in the nursery of Mr. W. Brooks, of Weston-super-Mare. The two sexes are less dissimilar than usual, except in the column and ovary, which present the usual dif-

ferences. The sepals and petals are light green, with numerous blackish spots. Although borne on the same raceme, the females expanded several days in advance of the males, thus pointing to earlier development in this sex.—*Gardeners' Chronicle*, July 11th, p. 36.

Cirrhopetalum Thonarsii, Lindl.—Although described nearly seventy years ago, and the original species of the genus, this rare Mauritian plant has only recently appeared in cultivation, for it is now evident that the Philippine plant which Lindley thought identical, and which has borne the name in gardens for so many years, is a different species. Plants were sent to Kew by C. W. Bewsher, Esq., of the Oriental Bank, Mauritius, together with other native Orchids. One plant which has now bloomed has light yellow flowers, without any spots. A second plant, believed to be spotted with red, has not yet flowered.—*Gardeners' Chronicle*, July 18th, p. 69.

Cycnoches chlorochilon, Klotzsch, ♂ and ♀.—As in a previous case, it is the female flower which is new to gardens, the other sex having long been known. A female flower has appeared in the collection of Monsieur Houzeau de Lehaie, member of the Chamber of Representatives, of Hyon, near Mons, Belgium. It is larger and more fleshy than the male, with broader sepals and petals, and the crest of the lip much more obtuse. The ovary is also more than twice as thick and more strongly grooved, and the column scarcely half as long, at least four times as thick, without pollinia, but with a pair of large fleshy wings on either side of the well-developed stigma. The color is identical in the two sexes, which are thus far less dissimilar than in most other species of this singular genus.—*Gardeners' Chronicle*, July 18th, p. 69.

Odontoglossum Bergmani, L. Lind.—A handsome Odontoglossum in the way of *O. luteopurpureum*, but with chocolate spots on a white ground. It was awarded a first-class certificate of merit at a meeting of the Orchidéene, of Brussels, on April 12th last, when it was exhibited by Monsieur Bergman. It is suggested that it may be a variety of *O. luteopurpureum*, but I consider it a natural hybrid with *O. crispum*.—*Lindenia*, t. 286.

Kew. *R. A. Rolfe.*

Plant Notes.

Phalænopsis Schilleriana.

The numerous species of Phalænopsis that have been introduced within the past thirty years are far from being as satisfactory as this fine old favorite, and, indeed, those that were known previously lack some of its best points. The utility of the plant is found in the profusion and lasting quality of its attractive flowers, and in the handsome character of its variegated foliage. Some descriptive and cultural particulars have already appeared in this volume of Garden and Forest, on page 117.

P. Schilleriana was introduced from Manilla in 1858 by Mr. Consul Schiller, a gentleman who had a famous collection of Orchids in Hamburg at that time, and in compliment to whom this species was named by Professor Reichenbach. This importation consisted of some thirty plants, only one of which, however, survived, and flowered at Hamburg two years later. In 1862 it flowered for the first time in England, at Broomfield, the place of the Mr. Robert Warner famous in Orchid history. Mr. Warner's plant seems to have been collected privately, and its native locality was not disclosed at the time. An idea of the progress which has been made in the search after new Orchids—of the devastation wrought by collectors, some will have it—may be obtained from the statement that only five kinds of Phalænopsis were known in England when *P. Schilleriana* had been introduced; between thirty and forty are now being cultivated in that country.

Many fine specimens of *P. Schilleriana* have been grown in England, and in late years a few have been produced in this country and Canada. A plant sent from London by Mr. Warner to the Russian International Exhibition, held at St. Petersburg in May, 1869, bore 120 fully developed flowers at one time. Two excellent plants, grown in the collections of Frederick Scholes, Esq., of Brooklyn, New York, were figured in the *Gardeners' Chronicle* of April 28th, 1888, and noted in the first volume of Garden and Forest. Mr. Scholes attributed his success with this plant to a liberal use of cow-manure.

The specimen, from a photograph of which the accompanying illustration was prepared (p. 390), flowered at the gardens of John Hoskins, Esq., Toronto, Canada, in 1890. It carried about seventy flowers. The same plant had 129 flowers this season, all fully in bloom at the same time. It is grown in a well-lighted stove in which the atmosphere is kept constantly moist by means of a hot-water tank in the centre. In other particulars the treatment does not differ from that observed in other establishments. An engraving of a plant at Melchet Court, England, the most extraordinary Phalænopsis of which we have any record, was given in the *Gardeners' Chronicle*, August 7th, 1875. This plant measured seven feet in height and five feet through, bearing flowers to the number of 378. When sold at auction a few months later it realized a sum exceeding $150.

Cambridge, Mass. *M. Barker.*

Some Recent Portraits.

The August issue of the *Botanical Magazine* contains figures of *Faradaya splendida* (t. 7187), a handsome tropical climbing plant, a native of Queensland, and dedicated to the physicist Michael Faraday. The plant is described as conspicuous by its handsome bright green foliage and copious panicles of very fragrant snowy white flowers which appeared at Kew for the first time in September of last year. An allied species, *F. Papuana*, of New Guinea, is also in cultivation at Kew, but has not yet flowered; *Cypripedium Californicum* (t. 7188), the handsome California Lady's-slipper which was figured in the first volume of Garden and Forest (page 281); *Pleurothallis immersa* (t. 7189), a New Granada Orchid, with small dirty brown flowers borne in elongated racemes rising above the leaves. It is a plant of considerable botanical interest, although gardeners generally will be inclined to pass it by. *Synantherias sylvatica* (t. 7190), a small East Indian aroid, is another plant which is curious rather than beautiful from the horticultural point of view; *Rehmannia rupestris* (t. 7191), the representative of a genus of *Scrophulariaceæ*, now known to consist of six or seven species, all natives of China, Formosa and Japan. It was discovered by Mr. A. Henry, in the province of Hupeh, growing only in almost inaccessible places on the faces of mountain-cliffs. It is a semi-prostrate plant, densely coated with whitish wool and having solitary axillary flowers, with long yellow tubes marked with purple on the inner surface of the limb. Of its horticultural value very little can be said, as the specimen which flowered at Kew, and which had been raised from seed taken from one of Dr. Henry's herbarium specimens, died as soon as it had flowered.

Cultural Department.

Russian and Polish Pears.

I began to try these Pears with many misgivings, but I think better of them every year. The hardiest of our old kinds I have been obliged to give up, after long and repeated trials; even our mildest winters blackened their new wood. Rather colder winters killed back nearly all the new growth, while one of our "rippers" killed every tree to the snow-line. There is rarely an interval between these extreme seasons long enough to enable us to see any fruit; and after twenty years of such experiments I gave it up beaten, having gathered just one ripe pear—from Jackson, a New Hampshire variety. When a fruit named for Old Hickory had to succumb, I felt justified in abandoning the field.

But before this end of the struggle I had received from my kind friends, Professor Budd, of Iowa, and the lamented Charles Gibb, of Quebec, a lot of cions from their then recent importations. From these, worked close to the ground on Vermont-grown stocks, I grew quite a lot of trees of many varieties. Professor Budd also sent me a few young trees from his earliest home propagations, so that I started almost even with them in my testings of their hardiness, and I have now a fine collection of these trees from six to twenty feet high, not one of which has lost a bud. Even Sapieganka, decidedly the

Fig. 64.—Phalænopsis Schilleriana.—See page 389

tenderest among them (and said to be the best in quality), is only a little discolored in its new wood by our worst winters. I should call it as hardy as the Fameuse Apple. Lutovka, a Polish Pear, said to closely resemble Flemish Beauty, is of about the same hardiness.

Bessemianka takes the lead of the whole list as a hardy and vigorous tree. My oldest specimen, from Professor Budd, is now over twenty feet high, and with three others, which he sent me the next year, is bearing some fruit, having bloomed for two seasons before. Merely as an ornamental tree the Bessemianka is well worth planting. Its remarkably rapid upright growth, its large, thick, glossy leaves, apparently impregnable both to insects and fungi, seem to indicate close relationship to the Chinese Pears; but Mr. Gibb thought the fruit to be of the Bergamot type. We shall learn more on those points hereafter. As this Pear (as its name, both in Russian and also in German, Samenlose, or Kernlose, indicates) has rarely any perfect seeds, I have feared in regard to its setting any fruit until other varieties bloom near it, though the flowers seem perfect. We shall know more about this hereafter. Certainly it can set some fruit unaided. Its season is from September to October.

Lutovka is a Pear whose fruiting I await with much interest. Though said to be like Flemish Beauty in fruit, it does not resemble it in growth. It makes but few branches, and hardly needs any pruning, but still it makes a good annual increase of woods.

Sapienganka is a straggling, strong-growing tree, quite noticeable for the bright red petioles of its leaves, which are so distinct as to impart a character to the tree. It is probably the tenderest of the Budd-Gibb importation, and is condemned for the north-west as lacking hardiness, but I think it will do for northern New England. It is said to be a native of Lithuania, and to be generally planted there and in Poland. When well started it grows nearly as fast as Bessemianka, but much more slowly and unshapely in the nursery. It is said to be very productive—the fruit in form like a Bergamot (that is, roundish ovate), and might be mistaken for the Summer Bergamot. The flesh is described as yellowish white, juicy, and finely flavored, and it is said to be a good market pear. Season in Poland, August and September.

Tonkovietka.—This seems to be a very slow-growing variety in the nursery and when at first transplanted, but after getting under way it makes a good growth; yet at eight years old it is not half as high as Bessemianka. It is hard to get a straight shoot from it when young. Mr. Gibbs speaks of it (Eighth Report Montreal Horticultural Society, p. 53) as "the hardiest Pear I know which bears an edible fruit—hardier even than Bessemianka." The name means "slender stalk." A fairly good eating pear, but not equal to Bessemianka.

Gakovskaya is a strong-growing, very hardy Pear, reported by Professor Budd to be somewhat like our old Pound Pear, and suited only for cooking. Season, October.

Besides these, there are several Russian Bergamot Pears, varying in season, that are hardy here, and grow well.

Newport, Vt. *T. H. Hoskins.*

Mistakes in Growing Strawberries.

For a number of years my beds averaged over 200 bushels of berries per acre. Many acres within the last ten years have yielded not less than 10,000 boxes per acre. This year the average yield has been about 6,000 boxes or quarts per acre. An account of my mistakes may be worth more than one of my success.

In the spring of 1890 we set our plants for this season's crop. After they had been set, early Peas, Beans, Onions, etc., were planted between the rows. In this way a crop can be obtained from the land the first season, and be out of the way by the time the runners need it. Our plants between the rows yielded well. The vines and refuse were taken off and added to the compost-heap. But the weeds—how they did grow! We were driven with work until we hardly knew what to do first. It seemed very difficult to get help, and I kept thinking that by "to-morrow" we would be able to finish cleaning out the Strawberry-beds, and so matters went on until something like half an acre was overgrown with weeds. Finally, it actually cost me more to clear away the weeds when at last I did it, than it would, had I done it before they had caused any damage. I cannot tell just what that neglect has cost me; but Nature charged it up against me, and has taken full pay out of the crop. It was certainly more than $100, and, I believe, it was nearer $150.

One more mistake: We are passing through the driest season I have known for thirty years. The Strawberry crop about here was almost an entire failure, except where it was carried through by artificial watering, and we are almost the only growers in the county who have facilities for so doing. The drought commenced early in the spring, and I noticed that my Strawberry-plants scarcely started even after the growing weather had come. I knew that they were in need of water, but kept thinking that rain would surely come within a day or two, and then they would soon catch up. Rain did not come, and after waiting too long I started the water-pipes upon them. They were kept well watered from this time to the close of the season, but they had been damaged in a way I had not anticipated. They came out with as great an amount of bloom as I had ever seen; but the foliage to carry such a crop was not there. The result was that the berries were not of their usual size, neither did the late sets fill out as they should have done.—*J. M. Smith, in Rural New-Yorker.*

Rose Notes.

The large-flowered Roses, now so popular, are highly ornamental, yet some of the smaller-flowered varieties are equally useful in their way, and, for certain purposes, are most appropriate. Among these Bon Silene continues to hold high rank, and is still the most satisfactory small pink Rose for in-door use, while Douglas, an old Rose of the Bengal class, producing crimson buds of about the same size, is its worthy companion. Both of these are among the sturdiest of growers, and will give a succession of bloom through the whole season, the flowers being much improved in substance when grown cool. Duchesse de Brabant is also a good pink, though, when growing strongly, the flowers are often produced in clusters. These three Roses may be grown for several years without replanting if they are placed in a solid bed, the Bon Silene, particularly, giving better flowers the second season than the first. It is also benefited by moderately hard pruning.

Young Roses of recent planting should now be growing away freely in order to be in good condition for the winter, and some care in watering is quite necessary during the muggy days that often prevail in August, for the roots will not have spread very far, as yet, in the new soil, and they are easily discouraged by too much moisture at their new roots. Thorough ventilation is essential, not only in the day, but also at night, for long, sappy growth is generally undesirable.

If space can be spared for such purpose, a strong plant of Marechal Niel, trained on wires attached to the roof of the greenhouse, may be made to produce large crops of flowers, if its roots are under control so that the plant can be given a season of rest. It seems almost a pity that this Rose is a cropper in blooming, though its immense golden flowers are of such beauty as to be well worth waiting for, even though they have the disadvantage of having very weak stems.

Another old Rose that is seldom seen of late years is Caroline, a Tea Rose of very good form and fair size. It is light pink in color, the buds being long and pointed, while in habit it resembles Niphetos, and, like the latter, will give the best satisfaction when grafted on Lamarque.

Among the Hybrid Perpetuals for early spring-flowering in pots, Eugenie Verdier should not be overlooked, its silvery pink flowers being peculiarly attractive; in fact, it is one of the best of the Verdier type.

Some discussion has been carried on among Rose-growers as to the necessity or advisability of packing the soil tightly in the benches in which Roses are planted, and the correct method seems to depend upon the character of the soil. In some localities the soil is more liable to become too hard than too loose, and consequently it does not need very much pressure in planting, while in other instances it may be an improvement to compact the soil by pressure with a brick or block of wood after planting.

The application of fertilizers to young Roses should be made with caution, for if overdone the soil may become soured, to the serious injury of the crop, but, as much depends on the character of the soil used, the question of manuring must be decided by the circumstances of the individual grower.

Among the newer Roses we find still another Duchess that is very highly recommended, namely, Duchess of Leeds, a Hybrid Perpetual, described as "a highly colored La France," but said to be quite distinct from Duchess of Albany. It is claimed for this Rose, too, that it lasts well when cut; but as this new-comer has not yet been tested to any extent in this country it is too soon to pass upon its merits.

A new Tea, Mrs. James Wilson, is also well spoken of in England. Its color is pale lemon-yellow, with rosy margins,

and in shape, size and growth it is said greatly to resemble Catherine Mermet.

Ernest Metz apparently did not strike the popular fancy to any great extent as a dark pink Tea, and has not proved able to compete with others of purer color, and consequently but little is heard of it now.

The future of Waban seems assured from the favorable reports received from all sides upon this fine sport from Mermet, and it has been planted in large quantities by the leading cut-flower growers to supply the market for the coming winter. There is apparently but little change among the Hybrid Perpetuals planted for winter use, except the improvement made in quality of flowers produced, and the favorites of former years, such as Mrs. John Laing, Madame Gabriel Luizet, Heinrich Schultheis, Ulrich Brunner and Anna de Diesbach, will doubtless continue among the most popular.

Holmesburg, Pa. *W. H. Taplin.*

Hardy Plant Notes.

THE successful cultivation of *Iris Susiana* out-of-doors (see Garden and Forest, vol. iv., p. 357) is rather unusual, but I think it can be explained. The cultivation of this Iris in Holland has apparently been better understood of late years, and, as I have before stated, seven out of twelve rhizomes, purchased last fall, flowered this spring. This success is also unusual, but is owing, perhaps, to the very fine roots the Dutch growers sent us last fall. The principal reason for advocating pot-culture is, that all of the Oncocyclus group of Iris enjoy a thorough baking in the sun after the flowering season is past and the leaves have died off. Our plants are now undergoing this treatment in a cold frame, and after this thorough ripening will start to grow vigorously next fall. I have never heard of any one who has successfully grown this Iris in the open air any length of time. Our experience has been similar to that of Mr. Barker's in the Harvard Botanic Garden, and a good round number of roots have been used to experiment with.

We hear much of the new *Iris Gatesii*. It belongs to the same group as *I. Susiana*, and is, we are told by Herr Max Leichtlin, the largest-flowered Iris known, and exceeds the Mourning Iris in beauty; let us hope that the plant may soon be common. *I. Iberica* is, to me, quite as beautiful as *I. Susiana*, and I think the markings are much more delicate and refined. The plant itself, when in flower, does not exceed six inches in height. With me it flowers perfectly well in the open ground, but we do not often see it in bulb lists. I quite agree with Mr. Gerard (vol. iv., p. 334) that it is "difficult to understand why, cultural skill being equal, Irish bulbs should be better than others," but certain it is that in Ireland the Narcissus has found a most congenial soil and climate, for any one who has seen them there will find it hard, as I did, to believe they are not indigenous. But the fact is, that many of the commonest weeds here in New England are not native, and yet they grow with more vigor than in their original homes.

Mr. Orcutt's notes on the new Californian Poppy suggest the query why the lovely *Romneya Coulteri* is scarcely to be had here in the east. I have repeatedly purchased seeds and sown them with all care, but have failed to raise anything besides weeds. I sent to California for plants last fall and received nothing but excuses in return. A leading eastern firm to whom I applied "did not have it," although it was advertised in their lists. It is common in England, and I suppose the only way to get it is to send there, for American plants are appreciated there as they deserve to be; even the common *Rudbeckia hirta* is there thought worthy of two synonyms, and the number of these may sometimes be taken as a fair index of the popularity of a plant.

So. Lancaster, Mass. *E. O. Orpet.*

Some New Tufted Pansies.

THE cultivation of the so-called tufted Pansies is increasing in this country, and is likely to become still more general, and we therefore reproduce from *The Garden* some notes by Mr. W. E. Gumbleton on the merits of a few of the newer varieties sent out by Messrs. Dobbie & Co., Rothsay:

Wonder.—This is an extremely pretty variety of most compact and tufted habit of growth in the way of Ardwell Gem, but a decided improvement on that good old variety. It is a profuse and continuous bloomer, and has flowers of a good size, of a clear, pale canary-yellow, with a deeper centre clearly penciled with a few distinctly marked black lines. This is quite an acquisition.

Cottage Maid.—This is in the way of Countess of Kintore but an improvement on that pretty old variety, with most distinct, deep plum-colored centres and almost pure white upper petals. It is also of good and compact habit of growth.

Vernon Lee.—This closely resembles the excellent and effective older variety Jackanapes, with flowers of the same combination of golden lower petals and rich brown upper part of flower, the only difference being that in the newer variety the flowers are of more perfect form and better substance, and the outer half of most of the upper petals is distinctly laced with gold, which is never seen in Jackanapes. The habit is also compact and good.

Queen of Scots.—This is much in the way of Cottage Maid save that the flowers are rather larger, the upper petals of a purer white and the centres purple instead of plum color. The habit of growth, however, is not quite so satisfactory.

Mrs. Grant.—This is a rather pretty and extremely free-blooming sort, of compact habit of growth, and may be briefly described as a paler own sister to Cottage Maid, with more clearly colored upper petals.

Bronze Medal.—This variety has nothing to recommend it save its compact habit of growth. Its flowers are small and poor and of a pale washy shade of brown, quite inferior to many older and better-known varieties.

York and Lancaster.—A most striking variety mottled somewhat like the old Rose of that name, but with purple instead of rose color.

Blue Cloud.—A most lovely variety, which may be briefly described as a white Duchess of Fife with a distinct bordering of pale blue round all the petals. This should prove a great acquisition.

Dawn of Day.—This is also a most distinct and showy variety with large white flowers distinctly and most effectively penciled with blue. Quite an acquisition.

Bullion.—A fine, deep, bright golden yellow, rather a small flower, but a very telling shade of color.

Max Kolb.—This is one of the older sorts, but not so well known as it deserves to be. It is quite the best and most continuous blooming blue Pansy known to me. The flowers are of large size, borne on stout erect foot-stalks well raised above the foliage, and of a fine intense shade of blue, not quite so deep as those of A. Grant, but of rather larger size than those of that fine variety. The centres of the flowers are black, with a small yellow eye. Altogether a most excellent variety.

Orchid Notes.

Cypripedium barbatum, var. superbum.—The numerous varieties of *C. barbatum* are all more or less useful—as, indeed, is the species itself—and they find favor with many growers in preference to the more expensive species and hybrids. The flowers of this variety are much larger than those of the type, and their coloring is more distinct and beautiful. The purple of the lip is deeper in shade; there is more of the purer white in the dorsal sepal, less green, and the purple lines are broader and brighter, approaching reddish purple. It is even more floriferous than the free-flowering species, and the length of the erect scapes, often exceeding fifteen inches in strong plants, with the superior lasting quality of the flowers when cut, admirably adapts them for decorative work. The variegation of the foliage, too, is more distinct and handsome. Had I to choose one Cypripedium, conspicuous above all others for beauty combined with utility and ease of management, from the already long list of species, hybrids and varieties now in cultivation, I should select this variety. It will give satisfaction as to growth, and bloom in an atmosphere of intermediate warmth, but plants grown in the higher temperature of a stove have the flowers and leaves of a somewhat better color.

Phalænopsis Luddemanniana.—Many of the Phalænopsis are more showy than this one, but it is a pretty free-flowering species, well worthy of a place in any general collection of stove-plants. It was introduced to English gardens from the Philippine Islands in 1865, but appears to have flowered earlier with Monsieur Luddemann, of Paris, in compliment to whom it was named by Professor Reichenbach. This Monsieur Luddemann was one of the great Orchid kings of his time, and the now historical collection of Monsieur Pescatore had been under his management. *P. Luddemanniana* is small of growth compared with most other species, the succulent, oblong, acute, light green leaves being little more than six inches in length at their best. The flower-stems are usually longer than the leaves, and appear at various seasons of the year, bearing from four to six blooms two and a half inches across. Petals a trifle smaller than sepals, both oblong, acute, white, with numerous trans-

verse bars of purple; lip trilobed, the central lobe rich violet, the lateral ones white or pale purple. The flowers hold their color from six to eight weeks, but they retain their rigidity and perfection of form in a blanched state much longer. The stems should not be removed when the flowers have fallen, if it is desirable to increase the stock, as afterward they almost invariably bear plantlets. There are several varieties of this species, differing chiefly in the color of the flowers. Some of these varieties are rather scarce, and they all thrive under the ordinary treatment of Phalænopsis.

Cambridge, Mass. *M. Barker.*

Correspondence.

Dr. Schlich's Handbook of Forestry.

To the Editor of Garden and Forest:

Sir,—The publication of the second volume of Dr. Schlich's treatise on forestry, which has been reviewed in your paper, is an event of much importance in the development of an English forestry literature. This volume, which deals with the "Formation and Tending of Woods, or Practical Sylviculture," is the most thorough work upon the application of scientific principles of forestry that we have in our language. Dr. Schlich has arranged and condensed his material with care and skill, and has packed a vast amount of information into the first two hundred and thirty pages. The latter part of the volume consists of "Sylvicultural Notes on British Forest-trees."

While Dr. Schlich's work must always be of value to foresters in any part of the world, a perusal of it suggests that the conditions under which the principles of forestry must be applied in this country are so different from those prevailing in European countries that no book of this kind not written with special reference to the United States can be entirely satisfactory to the American forester. Dr. Schlich seems to contemplate only cases in which forest is to be established upon areas practically treeless. Of the treatment of vast areas of forest suffering from neglect, or from our brutal methods of lumbering, he says little or nothing. Yet in this country such areas, too extensive for the comparatively elaborate systems of culture that he describes, must first receive the forester's attention. Our task is not so much to establish new forests as to treat those that we have in such a way as to obtain the greatest possible amount of forest-products without destroying the forests. The problems peculiar to this country must be worked out here. Probably, even the experience of Dr. Schlich and Dr. Brandes with the old forests of British India would be of comparatively little value in solving these problems. It is at least safe to say that in some of the small details of practical forestry, the irrepressible Yankee will apply his own ideas. Thus, he would devise his tools without reference to the traditions of the Old World. Dr. Schlich gives a number of cuts of tools, of which some are probably excellent, but some seem to the American eye to be too awkward for the use of man. That this is the case is not surprising in the light of the European creed as to hand-tools, thus set forth on page 58 of the volume:

"Many and various are the forms of the several tools which have from time to time been recommended for use in the preparation of the soil. Of these, a considerable number are of doubtful utility. As a general rule, the ordinary laborer gets through more and better work by using the tools with which he is acquainted than by substituting even an improved form of tool, the use of which he has first to learn."

If this comfortable and conservative doctrine had prevailed in this country, how far should we have advanced toward that mechanical superiority that we boast of? The Yankee who learns from a countryman returned from studying forestry in Europe that French and German foresters fear to use their axes in frosty weather lest these tools should be broken, will not believe very readily that we cannot devise our own forestry tools. At least, in the article of axes we may claim some superiority. With what Homeric laughter would the hardy forest-destroyers of Maine and Michigan shake their snow-laden Pines if some trained woodsman from the Black Forest should expound to them in friendly warning his theory of axes and frost!

A perusal of Dr. Schlich's list of twenty British forest-trees, not all natives of the British Isles, and not all trees that we should think of including among timber-trees, brings to mind the wonderful variety of forest-wealth of our Appalachian region, not to say of our whole country.

But with these empty gratulations our self-satisfaction must cease. Our chief instrument of forest-destruction is better than the European's; and nature has bestowed upon us a wonderful variety of valuable trees against which we may turn this instrument. It is idle to deny that in all essential points of scientific forestry we must look to the Old World for instruction. Dr. Schlich's book is so clear and interesting in its presentation of the subject that all in this country who have any interest in the subject should read it with care. Such a book as this should do much to temper and direct the often-distorted enthusiasm of our forest-lovers.

New York. *James W. Pryor.*

Experiments and Expedients.

To the Editor of Garden and Forest:

Sir,—For thirty years it has been difficult to raise a good Quince-crop in this section, but the fruit can be had with proper precaution. The trees are more tender when young, and I then take special care to secure well-ripened wood, and in October tie it about with straw. As the trees get older they become hardier, but the fruit is likely to be scarce, on account of the weakening of the terminal wood; I therefore tie the limbs together with hop-twine, a coarse, soft, but strong twine, and after that tie about the bunched limbs straw or hay. This precaution, with hedges of Arbor-vitæ to the west and north, leaves the trees vigorous enough to produce full crops. Quince-trees are worth growing for their beauty in the blooming season, and an Orange-grove is hardly more beautiful than a Quince-orchard in full-bearing.

It has been difficult, too, for the last half century to grow Peaches in this region. Fifty years ago I saw my father pick Sweetwater grapes, peaches and wagon-loads of quinces from his gardens. But the borers came, and then followed greater inequality of temperature. I have for twenty years persisted in growing Peach-trees, both seedlings and grafts. Unprotected, we secure a crop just about once in ten years. This year I have fifty-five trees loaded. My experiments have included: (1) Winding the bearing limbs in straw, which is rarely of much avail; (2) bending down limbs and covering with sod or soil, which leads to rot of buds and sometimes branches; (3) bending down the trees and holding them with spikes, which is efficient in a limited degree; (4) building a rude house over a tree or close row of trees, which is less trouble than it appears in the telling, and when the trees are so covered, and fine hay stuffed in over the tops before nailing on a roof, this affords sufficient protection for our hardiest sorts. But (5) my best experiment has been the planting of a large, cheap, roofless house with six trees. Over the top I nail narrow slats, and allow my hens to run in it for the summer; during winter I spread over corn-stalks, and hold them in place with poles. Of course, the roof must be firmly supported. Here my trees are full of fruit. Another (6) plan has been to grow a few trees in boxes and set them in the cellar for the winter. These do well with little care. In a Peach section such precautions would be laughable; but here peaches are peaches, and it pays to take much care and try many experiments.

Clinton, N. Y. *E. P. Powell.*

A Good Example.

To the Editor of Garden and Forest:

Sir,—In the passage leading to the town library at Tunbridge Wells, an exhibit is made, and constantly renewed, of the local flora and common plants. The specimens are placed in separate glass vessels and in front of each is a label bearing the common and botanical names. Such a means of popular instruction and interest might be well adopted at some of our American summer resorts, and at very small outlay.

Tunbridge Wells. *Francis Skinner.*

Recent Publications.

Jinrikisha Days in Japan. By Elizabeth Ruhamah Scidmore. Illustrated. New York: Harper & Brothers. 1891.

Many books have been written about Japan, and most of them contain descriptions of its forests and gardens, its flowers and flower-festivals. But the subject seems inexhaustible, for each gives us new details and general pictures. Mrs. Scidmore's little book is not written from the scientific or from the artistic point of view. It is for popular reading, and professes merely to sketch "something of the Japan of to-day as it appeared to a tourist, who was a foreign resident as well," being "the outcome of two visits, covering nearly three years' stay in the Island Empire." But its author has a keen eye and a knowledge of the value of definite information, as well as a

feeling for the beautiful and the picturesque, and a very graceful pen. So her book is interesting from end to end, and when we lay it down we feel that, despite all we may have read upon the subject before, she has taught us something fresh and given us another and very charming general impression of the delightful land she describes.

The first thing she speaks of, after landing at Yokohama, is the colony of florists at the west end of the town, where one finds "toy gardens filled with vegetable miracles; burlesques and fantasies of horticulture; dwarf trees, a hundred years old, that could be put in the pocket; huge single flowers and marvelous masses of smaller blossoms; Cherry-trees that bear no cherries; Plum-trees that bloom in midwinter, but have neither leaves nor fruit; and Roses—that favorite flower which the foreigner brought with him—flowering in Californian profusion." And from here on we read so continually of the skill of the horticulturist and the passionate love of the people for flowers that once more we feel, as other writers had already made us feel, that if Japan is the land of art it is still more distinctively the land of flowers. At Yokohama "a large business is done in the exportation of Japanese plants and bulbs encased in a thick coating of mud, which makes an air-tight case to protect them during the sea-voyage. Ingenious Fern-pieces are protected in the same way. These grotesque things are produced by wrapping in moist earth the long woody roots of a fine-leaved variety of Fern. They are made to imitate dragons, junks, temples, boats, lanterns, pagodas, bells, balls, circles and every familiar object. When bought they look dead. If hung for a few days in the warm sun and occasionally dipped in water, they change into feathery green objects that grow more and more beautiful, and are far more artistic than our own conventional hanging basket."

Mrs. Scidmore makes a novel suggestion when, after recognizing the fact that the Japanese are the foremost landscape-gardeners in the world, giving their genius "equal play in an area of a yard or a thousand feet," she says that "a Japanese gardener will, doubtless, come to be considered as necessary a part of a great American establishment as a French maid or an English coachman. From generations of nature-loving and flower-worshiping ancestors these gentle followers of Adam's profession have inherited an intimacy with growing things, and a power over them, that we cannot even understand. Their very farming is artistic gardening, and their gardening half necromancy."

Near Yokohama is the little village of Kawana, whose headman has a famous collection of Chrysanthemums, the goal of many autumnal pilgrimages. His great thatched house, in a courtyard, is faced in front by rows of mat-sheds, "covering the precious flowers that stand in files as evenly as soldiers, the tops soft masses of great frowsy, curly-petaled, wide-spreading blooms, shading to every tint of lilac, pink, rose, russet, brown, gold, orange, pale yellow and snow-white. It was there that we ate a salad made of yellow Chrysanthemum petals, most æsthetic of dishes. The trays of golden leaves in the kitchen of the house indicated that the master enjoyed this ambrosial feast habitually, and, perhaps, dropped the yellow shreds in his *saké* cup, to prolong his life and avert calamities, as they are warranted to do." Not far away is Sugita, where the Plum-trees bud in January and blossom gradually, so that "the last week of February finds the dead-looking branches clothed with clouds of starry white flowers." Around the thatched roof of an old temple stand Plum-trees covered with blossoms of various colors, white, pale pink, yellow, rose or deep carnation-red, and "just outside the temple door is a Plum-tree whose age is lost in legend. Its bent and crooked limbs and propped-up branches sustain a thick-massed pyramid of pale rose-pink. The outer boughs droop like a Weeping Willow, and their flowers seem to be slipping down them like rosy rain-drops. Poets and peers, dreamers and plodders, coolies, fishermen and the unspiritual foreigner, all admire this lovely tree, and its wide arms flutter with poems in its praise"; for, as Mrs. Scidmore remarks, "spring poetry" is not a drug in Japan, and the trees themselves gladly accept the shower of manuscripts annually produced in their honor. We cannot follow all her descriptions of the flower festivals of a Japanese spring, when, as our readers have often been told, the whole population turns into the suburbs for merry-making, philosophers and statesmen leave their labors to journey to some famous garden, perhaps a three days' trip away, and the newspapers print daily bulletins to tell how the blossoms are progressing. But, she says, fair as the spring days are, the autumn, when an Indian summer lasts sometimes four months in unbroken loveliness, is equally attractive. When the Maple-leaves begin to turn, "autumnal Japan is the typical earthly Paradise."

Near the Ikegami temples the priests display with pride a Moutan, or Tree Peony, "now three hundred years old, whose solid trunks and wrinkled bark uphold a multitude of stately blossoms." And when these bloom, and Azaleas of varied colors crowd every garden and line the river-banks, then, too, the *Fuji*, or Wistaria, is in blossom, "and at the Kameido temple makes an eighth wonder of the world. Every householder has his Wistaria-trellis, generally reaching out as a canopy over some inlet, or, as at Kameido, forming the roofs of the open-air tea-houses edging the lake. . . . Blossoms two, and even three, feet long are common, and only a great swaying tassel, four feet in length, draws a 'Naruhodo!' (wonderful!) from the connoisseurs." The great objects of wicker-work, clothed completely with Chrysanthemum-blossoms which amaze every traveler, are described at length by Mrs. Scidmore, who says that, in addition to single forms of men and beasts, one sees "whole mountain-sides of flowers, with water-falls of white blossoms spreading into floral streams, and Chrysanthemum women leading Chrysanthemum horses ridden by Chrysanthemum men across Chrysanthemum bridges. Gigantic flowers, microscopic flowers, plants of a single blossom, single plants of two hundred blossoms, have Bamboo tents to themselves" at the shows where these figures are exhibited; and their special attractions are as loudly proclaimed as the charms of fat women and skeleton men in the side-shows of American fairs.

A little description of the "Maple-leaf Club-house," near the Shiba temples, well shows the feeling of the Japanese for artistic decoration. Here there was a "long low room, usually divided into three by screens of dull gold paper. One whole side of this beautiful apartment was open to the garden beyond a railed balcony of polished cedar, and the view across the Maple-trees and dense groves of Shiba to the waters of the bay was enchanting. The decorations of the club-house repeat the Maples that fill the grounds. The wall-screens are painted with delicate branches, the panels above the screens are carved with them, and in the outer wall and balcony-rail are leaf-shaped openings. The dresses of the pretty *nesans*, the crape cushions on the floor, the porcelain and lacquer dishes, the *saké* bottles and their carved stands, the fans and bonbons, all display the Maple-leaf." On another page we read that even the charcoal under the tea-kettle is an artistic object, being twigs of Azalea charred and coated with lime without injury to their delicate forms.

In the chapter devoted to the theatre we find flowers again playing a prominent part. The actors enter the stage by two long raised walks through the auditorium, broad enough to accommodate horses and *jinrikishas;* these walks are called *hana michi*, or flower-walks, "and as a popular actor advances his way is strewn with flowers." Garden, forest and landscape effects are made on the stage "by using potted trees and shrubs uprooted for transplanting. The ever-ready Bamboo is at hand, and the tall Dragon-grass and the scene-painters produce extraordinary illusions in the backgrounds and wings." But we should never end if we tried to extract all the suggestive passages by means of which Mrs. Scidmore paints the love of the Japanese for flowers. We can only recommend her book to our readers as containing not only many more such passages, but delightful descriptions of scenery and sympathetic accounts of the people who live among these marvels of beauty, and have themselves produced so many of them.

Bulletin No. 93 of the Agricultural Experiment Station connected with the University of California is devoted to the investigation of different varieties of Oranges and Lemons grown in that state. The purpose of the investigation has been to show in a comprehensive way the composition of the leading varieties of these fruits, as they are grown in the different Citrus regions, and this is of great value to cultivators inasmuch as it shows the influence of various conditions of soil and climate upon the product of the groves, and also gives information as to the appropriate fertilizers to be used in each case. The physical data—that is, the per cent. of rind, pulp, juice and the like—are of interest from a commercial standpoint because they show the true quality of the fruit. The difference between an orange or a lemon which has such a thickness of rind and such a percentage of pulp and juice as characterize the best kinds of these fruits, and one whose weight is more than one-third rind and more than one-quarter dry pulp, is very apparent. And yet such differences exist. Besides this, although fruit is generally considered a pure luxury, consumers may find much valuable knowledge from studying the relative food-values of different varieties. The nourishing portions, which are especially shown in the saccha-

rine and nitrogenous contents, vary greatly among different kinds and under different conditions of growth. It is therefore an important question of domestic economy to the consumer to know what fruit he is using. The ash analysis, together with the nitrogenous contents of the standard varieties, show that the ingredients which the soil loses by an ordinary crop are a serious drain upon its supporting value, and what particular plant-foods suffer the greatest loss can only be known by determining the actual constituents that are withdrawn.

The body of the bulletin is taken up with a description of various varieties of oranges received from different places, together with a physical analysis, a proximate general analysis, and an analysis of the ash. For example, eight specimens of the Navel Orange, taken from different parts of the state, were investigated, and a similar analysis was made of several specimens of Mediterranean Sweet, Saint Michael's, Valencia, Malta Blood, Tangerine and some seedlings. Of course, it would not be of interest to quote all these details, but some of the prominent points of similarity and difference which have been brought out in the tables are interesting. In comparing the oranges as to their proportion of rind to flesh, the Navel, although the choicest of oranges, has, contrary to popular impression, no advantage in this respect over the Mediterranean Sweet or Saint Michael's. The average Navel contains about seventy-two per cent. of flesh, while the average Mediterranean Sweet shows seventy-three per cent., and the Saint Michael's eighty-one per cent.

In regard to the proportion of juice to flesh the Navel seems to be the driest, while Saint Michael's is the juiciest. The skin of the Navel, although thin, is hard and solid and weighs heavier than the more corky skins of the Mediterranean Sweet. As to the sugar contents of the juice, the maximum of sugar appears in the Navel orange grown on the hills, but it is approached very closely by other Navels, by the Mediterranean Sweet, the Malta Blood, the Pomona, and the Tangerine from San Gabriel. This Tangerine shows the highest proportion of cane-sugar in the whole series, but to what extent the cane-sugar determines the sweetness to the taste is a matter not fully understood. The proportion between the grape-sugar and the fruit-sugar is not yet determined, and is, of course, an essential factor in the case. The average sugar-content of fully ripe Navels, from all localities, is 10.8 per cent., which is more than that of the other varieties. A Valencia orange from Pomona shows a much lower sugar percentage. In respect to acid in the juice, the Malta Blood contains a maximum of more than two per cent., with an average of one-sixth per cent. in three samples examined. In contrast with the Malta Blood, Saint Michael's has a low acid-content, but this is combined with a low sugar percentage.

In discussing the nutritive value of the fruit the flesh-forming ingredients are the most important, and it is, therefore, of interest to compare the albuminoids of oranges with those of other fruits, and of different varieties among themselves. According to European data, oranges stand first among fruits in this regard, followed by prunes second, peaches and apricots third, bananas and grapes fourth, while apples and pears stand nearly the lowest on the list. The determinations of albuminoids in California oranges show smaller percentages, so that it must be concluded that the California fruit is less nourishing than that of Sicily. The difference observed, however, may be due to the age of the trees which bear the fruit, as California trees are usually young.

Referring to the composition of the ash and nitrogen contents of fruits, it is said that grapes stand first and oranges stand second in the quantity of mineral matter withdrawn from the soil. Heretofore, all conclusions bearing upon the ash and nitrogen of oranges and lemons have been based on European data, but from the comparative exhibit made here it seems, so far as oranges are concerned, that the California fruit draws much less upon all the ingredients that have to be replaced by fertilization, while the California lemon draws about the same amount of mineral from the soil as the European orange. Potash is the predominating ingredient in the ash, amounting to quite half its weight, and it is, therefore, highly important that the supply of this substance should be kept up. Fortunately, it has been shown, by previous investigation, that the potash supply in California soils and irrigation waters is exceptionally large, so that in many cases the demand of the fruit upon this element will be amply supplied in the course of cultivation. Phosphoric acid is not drawn upon so heavily, but, since the supply of this element is usually limited in California soils, it is probable that it would be prudent to use fertilizers containing it in large proportion. The natural supply of nitrogen, especially in southern mesa soils, is not large, and, as the draft made by the Orange on this substance is very heavy, it should be always among the first elements of plant-food supplied. Next to potash, lime is the ingredient most abundantly taken from the soil, although its percentage varies very widely, but the supply of lime in California soils is so universally ample within the orange-growing region that no replacement of this substance in fertilization will be called for. The large amount of sulphuric acid found in this fruit suggests gypsum as an acceptable fertilizing agent.

In regard to lemons, it can only be said, from the incompleteness of the investigation, that the acid, or the most important ingredient of this fruit, exceeds the commonly assumed average, and this point should ensure to California-grown lemons a high position in commerce. The relatively large proportion of sugar shown by the analysis is a feature which will further commend them to the consumer's taste, but there are very great differences among varieties in the proportion of rind to flesh and to extractable juice.

Bulletin 82 of the New Jersey Experiment Station gives a carefully illustrated account of the history and habits of the Rose-chafer, together with the details of some experiments for destroying this insect, which, upon the whole, are rather depressing. Careful trials were made with the arsenites, copper mixtures, pyrethrum, kerosene, lime, tobacco, ascetic acid, quassia, digitalis, corrosive sublimate, muriate of ammonia, cyanide of potassium, sludgite, kainit, alum, white hellebore, carbolic acid, Ailanthus-blossoms, and other alleged repellants and poisons with very unsatisfactory results. The hot-water cure, suggested by Mr. Kellogg, of Vineland, and at a later date recommended by Mr. E. S. Carman, was tried, and it showed that water heated to 125° Fahrenheit will kill the insect, but in practice it was found impossible to get the spray hot enough to kill at any considerable distance from the nozzle of the force-pump. It seemed to Professor Smith that only a solid jet of water could be kept hot if carried even eight or ten feet, and then would follow the practical difficulty of securing a large and continuous supply.

Mr. A. S. Fuller suggests that the species of Spiræa are very attractive to these insects, and that in small gardens, if a full supply of food from Spiræas was afforded, they might leave other plants. Following this line of suggestion, Professor Smith thinks it is possible to prevent in part the development of the insects in cultivated ground, and the outside of vineyards can often be defended by the counter-attraction of a few rows of Blackberries. The blossoms of these plants are great favorites with the beetles, and they would be likely to arrest the incoming crowds. If they were collected from these plants the injury to the vineyard might be largely averted. This matter of collecting seems, after all, to Professor Smith the most practicable method of dealing with the pest, and various mechanical devices similar to an entomologist's umbrella are figured. By shaking the vines the insects can be caught in these receptacles, and if the collecting is done once or twice a day for three weeks the crop may be saved. The Rose-chafer has no day of rest, and the collecting must be done on Sundays as well as other days, for a single twenty-four hours' neglect may result in as much injury as is prevented by six days' work. The insects come in such numbers that they cover everything—acres of Grape-vines, Strawberries and Blackberries, with thousands of fruit and other trees, and the best that Professor Smith hopes from persistent collecting, if carried on generally, is that, after some years, their number may be lessened so as to bring, for a time, comparative exemption from their attacks. At present, however, there are too many abandoned fields to make this appear sanguine, as the best of their breeding-places are left undisturbed, and no method of killing them before they come out of the ground has yet been devised.

Notes.

A basket of rare and costly Orchids, presented to the Empress of Germany by Messrs. Sander & Co., was the subject of a supplementary illustration in a late number of the *Gardeners' Chronicle*.

It is stated in *Fruits and Flowers of Oregon and Washington* —the new horticultural monthly of the north-west—that Peach-trees in Oregon measure fifteen inches in girth at three years old, with a spread of branches sixteen feet in diameter.

Perhaps few persons who visit the Botanical Gardens in Liverpool know that they were founded by William Roscoe, the celebrated historian. His name is preserved in the annals of science by that of the genus Roscœa, which includes half a

dozen species of herbaceous Himalayan plants, sometimes cultivated in greenhouses.

Decumaria barbara is quite at home in the neigborhood of Philadelphia, and in Laurel Hill Cemetery it is quite largely planted, and clings to walls as closely as English Ivy. Its leaves are large and lustrous, and it will certainly be used more generally when its good qualities are appreciated as they should be.

"The total number of trees and shrubs indigenous to this country," wrote Downing in the year 1846, "is about 530." How largely our knowledge of the products of the United States has advanced since this time will be seen when we note that 420 indigenous species of trees are now recognized within their area, while the number of indigenous shrubs must be nearly a thousand.

The old saying, that "language is a bundle of fossil metaphors," is well illustrated by the word disseminate, which, etymologically, means "to scatter seed," and, as a writer on plant-life recently remarked, "points to the fact that everywhere in nature seeds are scattered broadcast, infinite pains being taken by the mother-plant for their general diffusion over wide areas of woodland, plain or prairie."

We have received from our correspondent, Monsieur Charles Naudin, a photograph of a noble flowering specimen of *Yucca filifera* (see Garden and Forest, vol. i., pp. 78 and 79), taken in the gardens of the Villa Thuret. Judged by the height of the man standing by the tree, it must be from twenty to thirty feet high, and forms one of a group of five specimens, all about equal in height.

"The principle which would govern us," wrote Downing nearly fifty years ago, "if we were planting the streets of rural towns is this: Select the finest indigenous tree or trees, such as the soil and climate of the place will bring to the highest perfection." Unfortunately, the sound and sensible advice thus briefly conveyed is almost as sorely needed to-day as when Downing's words were written.

"Midway between Fifteenth and Sixteenth Streets," says the *New York Sun*, "at the curb lies a broken brown stone which bears the inscription, 'Union Square. Founded 1832.' It is a part of the pavement, and yet New Yorkers have walked that way for forty years without noticing this modest official record. This was a wild locality in 1832. A farm-house stood at the junction of the Bowery road and the road to Bloomingdale in the upper part of the present little park, and dust and blackberries abounded at the road-sides. The city straightened out the streets at that time into a square, and the park was an afterthought. The Hon. Walter Bowne was Mayor at the time."

A dispatch to *The Tribune* states that "next winter will see the shipment of an enormous quantity of fresh vegetables from southern California to New York and other eastern cities. The railroads have given a rate of three cents per pound, which allows a big profit on all vegetables that will bear transportation. Tomatoes, peas, beans, new potatoes, cauliflower and other vegetables can be supplied by southern California from the 1st of December to the 1st of March, during which time there is practically no competition from Florida. It is claimed that this industry will eclipse fruit-growing, as it will stimulate a demand for fresh vegetables where canned goods are now used."

The botanical name of the Carnation, Dianthus, signifies Jove's flower, being a contraction of *Dios anthos*, while the English name seems to have been bestowed to characterize the flesh-colored hue of some of the commoner kinds. Its earliest form appears to have been "Carnadine," and Drayton long ago wrote: "The brave Carnation . . . so of his color called." In the last century Carnations were in special favor in Holland and England, and we may read in a number of the *Spectator* that "now and then a few fanciful people spend all their time in the cultivation of a single Tulip or a Carnation." Fifty years ago between three and four hundred varieties of the Carnation were already noted in English catalogues.

Mr. Sereno Watson's eighteenth contribution to American botany, reprinted from the twenty-sixth volume of the *Proceedings of the American Academy of Arts and Sciences*, has appeared. It contains descriptions of some new North American plants, chiefly of the United States, with a revision of the American species of the genus Erythronium, in which Mr. Watson now recognizes thirteen North American species; descriptions of new Mexican plants collected chiefly by Mr. C. G. Pringle in 1889 and 1890, and including a few new genera and several new species; a note upon a wild species of Zea, from Mexico, and upon a small collection of plants made in the island of Ascension by Mr. E. G. Loomis, of the Nautical Almanac Bureau, during the visit of the United States Eclipse Expedition to the island in 1889.

The editor of the *Country Gentleman* says that he once received some Peach-cions in summer, and the sender had left their leaves on to shade them and to keep them from drying up. Of course, these leaves sent a great deal of watery vapor into the dry summer air, and in a few hours the shoots were withered. If he had cut all the leaves off, leaving only the stumps of the leaf-stalks, they would have remained plump and fresh. We often see radishes offered for sale in grocery-windows with all the leaves on, and in a few hours they are shrunk and withered. If the leaves of radishes, beets and similar vegetables are cut off at once as soon as the roots are taken from the ground they will keep plump and fresh. If the leaves are left on trees which are cut down in summer they will pump the sap out of the timber and hasten the seasoning of the wood, which might otherwise become sap-rotten.

A photograph recently reproduced in the *North-western Lumberman* showed a redwood plank of extraordinary size, measuring sixteen feet five inches in width by twelve feet nine inches in length and five inches in thickness. It was cut from a tree thirty-five feet in diameter and three hundred feet tall, being hewn out of the stump after the tree was cut at about twenty-eight feet above the ground. A locomotive, attached to a block and tackle, was needed to lower it, and two men were occupied for a month in roughly preparing it for shipment. The price of this labor, added to the cost of transportation, amounted to some $3,000, after the plank had been taken by water to San Francisco. The tree stood in Humboldt County, California, and the plank, after being exhibited in various cities, will probably be a feature of the World's Fair at Chicago. A specially constructed car is required for its transportation.

"After some trouble," wrote Fortune, in his account of his travels in the Malay Archipelago in 1845, "I discovered the locality of the beautiful *Phalænopsis amabilis*. I was in the habit of making an Indian's hut in the wood my headquarters for a certain time, where I held a sort of market for the purchase of orchidaceous plants. The ground in front of the hut was usually strewed with these plants in the state in which they had been cut from the trees, and often covered with flowers. The Phalænopsis in particular was very beautiful at this time. I was most anxious to get large specimens of this plant, and offered a dollar, which was a high sum in an Indian forest, for the largest specimen which should be brought to me. The lover of this beautiful tribe of plants will easily imagine the delight I felt when I saw two Indians approaching with a plant of extraordinary size, having ten or twelve branching flower-stalks upon it and upward of a hundred flowers in full bloom." This plant was successfully transported to England and established in the garden of the Horticultural Society, and, although it had been somewhat cut to get it into the packing-case, was by far the largest specimen then to be seen in Europe.

In his *Sylva*, written two centuries ago, Evelyn notes, among other giant Linden-trees in Germany, one of such size and antiquity that it was recognized in the name of the town in Wurtemberg where it grew, this being called Neustadt-an-der-Linden. He describes it as measuring more than twenty-seven feet in circumference, and covering, with the spread of its branches, a space four hundred and three feet in diameter, and says that it was "set about with divers columns and monuments of stone (now eighty-two in number and formerly above a hundred more) which several princes and noble persons have adorned, and which, as so many pillars, serve likewise to support the umbrageous and venerable boughs." Even then, Evelyn continues, the tree had once been "much ampler, as the ruins and distances of the columns declare, which the rude soldiers have greatly impared." Some of the inscriptions on the stones were copied by him, the oldest, bearing a date, having been cut in the year 1550. In 1837 this giant still survived, and a drawing then made of it, for Loudon's Arboretum, showed its trunk surrounded by a wooden balustrade raised on a coping of stone, and its limbs supported by no less than 108 columns. The people of the village being in the habit of sitting in the tree and eating, several Gooseberry-bushes had sprung up in the crevices of the bark, and their fruit was gathered and sold to visitors. It would be interesting to know whether this tree still survives in the year 1891.

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The Northern Pitch Pine.

INQUIRIES about this tree often reach us from Europe, especially from France and Germany, where the impression prevails that it is the species which produces the pitch pine of commerce, generally known in this country as southern pine or Georgia pine, and now exported from the maritime region of the southern Atlantic and Gulf-states to Europe and South America in large quantities. The vernacular name is, in part at least, responsible for this confusion. It should be remembered that all our Pines on which the leaves appear in twos or in threes in the same cluster, and which produce coarse resinous wood distinctly marked by broad bands of dark-colored cells, are called Pitch Pines, and that the Pitch Pine in New England and in New Jersey is an entirely different tree from the Pitch Pine in Georgia, or from the Pitch Pine in California; and that there are more than a dozen different trees in the United States to which this name is applied by the people living in the regions which these trees inhabit.

The northern Pitch Pine is the *Pinus rigida* of botanists. The wood of this tree was formerly used in building in those parts of the country where it was found before cheap transportation brought the more valuable material of the southern Pine-forests to northern markets. Now it is rarely manufactured into lumber, and during the last twenty years it is not probable that a single foot of it has been exported from the United States. The two Pitch Pines of North America, which now possess commercial importance, are the Pine of the south, *Pinus palustris*, and the western or Oregon Pine, *Pinus ponderosa;* and it is from the forests of the former that the pitch pine so largely used in the north is derived, and that furnish all the American hard pine sold in Europe.

The northern Pitch Pine is a valuable and interesting tree in spite of the fact that the lumber it yields is not of the best quality. It grows naturally on poor and sterile land, usually on sandy barrens, and less frequently in sour swampy soil. Its presence is a good indication that the soil which bears it is too poor to supply other trees with sufficient plant-food to compete successfully with this tree. Once in possession of a sandy plain on our northern seaboard no other tree can wrest this advantage from the Pitch Pine, and its hold upon existence is strengthened by the peculiar power it possesses of reproducing itself from seed. Seedlings spring up in great quantities in the neighborhood of seed-bearing trees, and grow rapidly in what would appear to be most unfavorable situations; and it can be raised from seed sown in the open ground more easily and with greater certainty than any other tree which is hardy in the northern states. In this capacity of the seed to germinate readily will be found the greatest value of this tree, which seems destined sooner or later to be used in covering the great tracts of unproductive land which occur in the neighborhood of our northern seaboard. Its value and adaptability for this purpose has already been proved. Thousands of acres of the New England coast have been covered with forests of this tree, raised from seed at a mere nominal cost, and nothing but the dread of fire prevents the extension of these forests over still larger areas. What appears to be barren soil, such as occurs on some parts of Cape Cod, in Massachusetts, and in southern New Jersey, will in forty or fifty years produce a forest of Pitch Pine of considerable money value for the fuel which it contains. No other method has yet been found by which such waste lands can be made to yield any return whatever, and any comprehensive system of agriculture must look to covering sooner or later these lands with trees. The Pitch Pine planted on barren soil will not grow to a large size or produce anything more valuable than fire-wood. It will, however, in a comparatively short time yield on the poorest land several cords of fuel to the acre; and the fuel value of this wood is unsurpassed by that of any other inhabitant of our northern forests, and for many purposes, such as brick-making and for charcoal, it is extremely valuable. When individual specimens have happened to grow in good soil they have sent up tall stout stems two or three feet in diameter. These trunks were eagerly sought for in the early settlement of the country, and were manufactured into timber and flooring of excellent quality and remarkable durability. In some parts of New Jersey houses timbered and floored with this wood a hundred years ago are still standing, and are in a perfect state of preservation. Such trees have now almost entirely disappeared, however, and there will probably never be a question of planting the Pitch Pine for timber, for where the soil is good enough to produce large individuals with straight clean trunks it will support a forest of more valuable species.

As an ornamental tree *Pinus rigida*, although it is not suited to decorate a trim lawn, can be used sometimes to advantage when it is desired to produce bold, picturesque effects or to clothe a barren knoll with verdure. It grows rapidly; the trunk, covered with dark, deeply furrowed bark, broken into large, square plates, is always a handsome object, and the color of the coarse, pale-green foliage makes a good contrast with the other trees of our woods and plantations.

The form this tree assumes, when it stands by itself and has the opportunity to develop the stout branches which are characteristic of single individuals, is well shown in the picture on page 402, made from a photograph of a peculiarly picturesque Massachusetts tree, for which we are indebted to Dr. W. H. Rollins, of Boston.

Monuments in Public Places.—I.

MORE and more, as the years go by, the questions involved in the placing of statues and other monuments in our parks, streets and city squares must attract serious attention from all who have the artistic interests of the community at heart. These questions are three in number: Is the person or event to be commemorated

deserving of such conspicuous and lasting honor? Is the monument sufficiently excellent as a work of art to be worthy of its subject, to satisfy the eyes of those qualified to judge in such matters, and to aid in forming a correct public taste? And is it so placed that it appears to the best advantage itself and in harmony with its surroundings, so as to increase the general attractiveness of the spot where it stands?

With the first of these three questions we need not greatly concern ourselves. Public monuments have very rarely been proposed to do honor to persons or causes whose commemoration would have a bad influence upon the community. We think that no such monument has ever been actually erected in this country, and if a number have been erected which record the existence of men in whom the public take small interest, no one need object to their presence for this cause alone. If a work of art is good as such, we may be glad to possess it, no matter how feebly our minds are impressed by the personality it portrays, or the idea it expresses.

But the question whether or no the work of art is good as such is very important, and not alone from the purely artistic point of view. It is a misfortune if the eyes of the people are offended, and their taste corrupted, by the constant sight of bad works of art, but it is also a misfortune when such a work persistently imprints upon the public mind a weak, false, or grotesque impression of a man entitled to reverence and respect. Bad monuments, in short, injure both those who look at them and those whom they profess to honor. And there are many such in all our cities. Who, for example, can be won to admiration of the poet by the contorted, ridiculous figure which, at the entrance of the Mall in the Central Park, bears the name of Burns? Or who can gain a fresh sense of the services that Seward rendered to the Republic by contemplating his statue on Madison Square? Farragut is really commemorated, really honored, by the figure which stands not far away from this Seward. Each time we pass it we think with gratitude and admiration of him, while we receive a never-failing impression of pleasure from the sight of the work of art as such. Nor need it be thought that the humblest among the populace are blind and deaf to the difference between the aspect and message of such works as these two. Hundreds of persons of all classes daily stop to study the Farragut statue, while, if one watches at the other end of the park, he will find that scarcely a glance is ever directed to the Seward. No one points out the Dodge monument on Sixth Avenue to the passing stranger, and, probably, few people know even that there is a bust of Washington Irving in Bryant Park, though, if these were really fine works, they would be recognized, like the Farragut, as among the things every visitor to New York should see. St. Gaudens' statue of Lincoln not only adorns the city of Chicago, and daily teaches its people what sculptor's work should be, but it helps to interpret our greatest man to the rising generation. But what lessons are inculcated by the statue of Lincoln in Union Square? And who will ever care to inform himself about Bolivar after seeing his equestrian figure in the Central Park?

The proportion of bad monuments to good ones in any American city to-day is probably at least ten to one. The collective effect of so many poor ones in deforming our public places and in discouraging, if not corrupting, the people's taste for art can hardly be overestimated, and surely the time has come when a more serious sense of responsibility should be impressed upon those who have such matters under their control. Whatever is now admitted to our parks and streets is almost certain to stand there for centuries. We cannot hope for many successful efforts like that of General Custer's widow, who, a few years ago, secured the removal of a ridiculous statue of her husband from the Government grounds at West Point. The only sure and sensible way to avoid bequeathing monstrosities to our children is to prevent their erection.

Adequate means toward this end have been provided as regards the Central Park at least, for no monument can be erected there without the permission of a committee of three persons well qualified to choose among good and bad works of art. Until lately, it must be said, this committee has consistently erred on the side of leniency. All lovers of art, therefore, were gratified to learn last spring that it had refused permission for the erection of a statue already completed, but judged of insufficient merit. They may regret that this same statue has since been set up in one of our small city squares; but it had better be there than in the park, and the precedent established by its rejection will surely work for future good. There is no danger, we believe, of over-severity in the matter. It is a painful task to refuse a work which is offered by generous, well-meaning citizens, and a task certain to bring a measure of unreasoning public condemnation upon those who are prominent in its performance. It is not likely that our park will ever be deprived of a work of even a reasonable degree of excellence, while it is likely that for many years to come foolish and grotesque monuments will be offered to it in ever-increasing numbers. We feel, therefore, that this is a subject with regard to which public sentiment of the right sort should be appealed to, and that the press and the people ought to encourage those in charge of our public places consistently to temper mercy to the artist and would-be donor with justice to the people at large and the cause of art. The streets and parks of a great city ought to be guarded against the intrusion of bad works of art even more carefully than the apartments of a public museum; for while hundreds or even thousands of persons may daily visit the museum, tens of thousands must, whether they will or not, daily look on objects set under the open sky.

Black Tea and Green.

WHAT is the difference between black tea and green tea? Are they produced by different plants or merely by different methods of treating the leaves? And are the Oolong and Japanese teas, so popular in this country, really green teas or black? One so often hears these questions asked, and so seldom gets a reliable answer, that our readers may be interested in the following account of Japanese tea-production which we quote from Mrs. Scidmore's "Jinrikisha Days in Japan."

The Tea-plant, as every one knows, is a hardy evergreen of the Camellia family. It grows a thick and solidly massed bush, and, at first glance at a field regularly dotted and bordered with the round bushes setting close to the ground, one might easily mistake it for Box. In the spring the young leaves crop out at the ends of the shoots and branches, and when the whole top of the bush is covered with pale, golden-green tips, generally in May, the first picking takes place. The second picking belongs to the fire-fly season in June, and after that great festival tea comes in from the plantations in decreasing quantities, until the end of August. The choicer qualities of tea are never exported, but consumed at home. Choice basket-fired tea, such as is used in the homes of the rich and well-to-do Japanese, sells for one or two dollars a pound. There are choicer, more carefully grown and prepared teas, which cost as high as from seven to ten dollars a pound, but such teas are shaded from the hot suns by matted awnings, and the picker, going down lines of these carefully tended bushes, nips off only the youngest leaves or buds at the tip of each shoot. The average tea, bought by the exporters for shipment to the United States and Canada, is of the commonest quality, and, according to Japanese trade statistics, the average value is eleven cents a pound, as it stands, subject to the export duty and ready for shipment abroad.

Japan tea came into market as a cheaper substitute for the green teas of China, those carefully rolled Young Hysons and Gunpowders of our grandmothers' fancy. Europe has never received the Japan teas with favor, but the bulk of American importations is Japanese. . . . For green tea, the leaves are dried over hot fires almost immediately after picking, leaving the *theine* or active principle of the leaf in full strength. For black tea, the leaves are allowed to wilt and ferment in heaps for from five to fourteen days, or until the leaf turns red and the harmful properties of the *theine* have been partly destroyed.

The Oolong tea of south China is nearest to green tea, its fermentation being limited to three or five days only, while the richly flavored black teas of north China are allowed to ferment for twice that period, to prepare them for the Russian and English markets. . . . The Japanese government made experiments in the manufacture of black tea in the province of Ise, but the results were not satisfactory, and no further efforts have been made to compete in that line with China. Japan will continue to furnish the world's supply of green tea. . . . The young tea-leaves, picked in May and early June, comprise more than half the whole season's crop, succeeding growths of leaves being coarser and having less flavor. Tea which is to be exported is treated to an extra firing, to dry it thoroughly before the voyage, and, at the same time, it is "polished," or coated with indigo, Prussian blue, gypsum and other things, which give it the gray lustre that no dried tea-leaf ever naturally wore, but that American tea-drinkers insist on having. Before the tea-leaves are put in the pans for the second firing, men, whose arms are dyed with indigo to the elbows, go down the lines and dust a little of the powder into each pan. Then the tossing and stirring of the leaves follows, and the dye is worked thoroughly into them. . . . This skilled labor is paid for at rates to make the Knights of Labor groan, the wage-list showing how impossible Tea-culture is for the United States until protectionist tea-drinkers are ready to pay ten dollars a pound for the commonest grades. During the four busy months of the tea-season the firers are paid the equivalent of eleven and four-tenths cents, United States gold, for a day's work of thirteen hours. Less expert hands, who give the second firing, or polishing, receive nine and six-tenths cents a day. Those who sort and finally pack the tea and who work as rapidly and automatically as machines, get the immense sum of fifteen cents. . . . Each year the United States pays over $7,000,000 for the nerve-racking green tea of Japan.

How We Renewed an Old Place.

XVII.—DISCOURAGEMENTS.

IT was, I believe, Sir George Cornewall Lewis who declared that life would be a very enjoyable thing were it not for its pleasures, which is convincing proof that he must at some time or other have interested himself in gardening, since this pursuit, which at first seems, of all others, the most gentle and enticing, leads the unwary dilettante from woe to woe before it has done with him.

As soon as our forest is tall enough to show above it, we are talking of erecting an arch at its most obvious point of entrance, with the appropriate inscription,

Abandon hope, all ye who enter here!

our experience leading us to think that the only true way to enjoy a prospective wilderness is to find one's blessedness in being among the happy few who expect nothing, and therefore can never have any but agreeable surprises. This arch, which perhaps will more appropriately take the form of a lich-gate, is to be sculptured with high-reliefs of the woodchuck and the field-mouse, while the rose-bug and the borer are to find a prominent place in the general decoration. This architectural step has been suggested by the appearance of a new enemy, which has destroyed the last vestige of our confidence in conifers, and is a new proof of that perversity in trees to which I have before reluctantly called attention.

Early in July we noticed a tendency to droop in the leaders of some of the Pines and Spruces, but concluded it might be the dry hot weather which had affected their uprightness. A week or two more passed, and the new tassels of the year's growth all began to turn yellow and to hang down disconsolately. We then supposed that some one in passing might have given the tops of the little trees an unfriendly twitch, from which they were suffering; but as the days went by and a stout little Norway Spruce near the house began to lose its top-knot, and Episcopus himself showed a bad kink in his mitre, we thought it worth while to look into the matter more closely, so we chopped off the head of one of the sufferers and gave it a post-mortem examination. Dissection revealed ravages, and the fatal secret was out. There was a worm at the core!

And not one worm, but many, small, white, plump and persevering, indifferent to resin, and coolly tunneling their way down the inside of the stem toward the ground. Certain leaks on the outside, and port-holes of their own construction, showed the exact length to which they had gone, so that by cutting just where these signs disappeared, we had the satisfaction of ending the earthly career of the leading invader by snipping his fat unpleasant carcass neatly in two.

We pursued our insidious foe from tree to tree with the shears, and beheaded him with great slaughter. But, alas! it was only a realization of the old nursery sneer, about cutting off your nose to spite your face, for when we had decapitated the worm we left a headless tree to serve as his monument, and, in some cases, the wretched little monster compelled the destruction of three years' slow growth.

The parent of the worm, being a fly of ambition and taste, invariably picked out the biggest and showiest of the poor little struggling trees to lay her eggs in, so that after the day of judgment was over and the ins(ect)urrection crushed, our pride was crushed with it, for the borer, not being, alack! the baseless fabric of a vision, left an awful wrack behind, both of our Pines and our vainglory.

Small comfort do we find in the assurance that the Pines will be none the worse for topping, for, with a life and trees so short as ours, "a few years" are not to be lightly regarded, and the poor hill had precious little good looks to lose, and has been waiting for its beauty already quite long enough. Moreover, what assurance can we have that every summer will not bring with it fresh devastation? It takes a year or two for insects to find you out; but their first call is never their last. If the borers have intelligence of the existence of Pines on "Doctor's Hill," they will come again as sure as the tax-collector, and new woes are in store for us from their visitations.

Moved by that desire to find consolation in our neighbor's ills, to which La Rochefoucauld cynically alludes, we go about spying at the tops of other people's evergreens, and find that this is the borer's year. Driving, a few days since, in a neighboring village, I saw, with concern, a long row of tall Norway Spruces at least forty feet high, that enclose a public garden, all suffering from the attacks of our fell marauder. Luckily, their tops will hardly be missed, while ours—Wae's me! as Carlyle would moan.

Now the question arises, Is there any prevention as well as cure for this infliction? Is there any application obnoxious to the borer's mamma that can be put where she would lay her eggs, and so induce her to move on? Has she any avowed distaste for whale-oil soap or coal-tar or kerosene emulsion, or any other unpleasant odor? And if there is such a deterrent, where should it be applied—on the very top of the leader, or at the place where the new shoots start from the old year's growth?

When a person sets out to plant a tree or two he scarcely bargains for having the study of entomology thrown in, with a course of chemistry into the bargain, not to mention toxicology and the trade of wholesale murder, until he might as well begin the career of gardener by serving an apprenticeship to the Czar of Russia. I am horrified by the bloodthirstiness developed by this seemingly innocent diversion; still, this but confirms the view of pleasures before quoted. Indeed, I am not sure but there is opening for an essay on the Dangerous Moral Tendencies of Gardening. The only objection to it is, that if the Legislature of Massachusetts got wind of such a thing it would pass a law which might prove inconvenient. There are advantages in having your morals legislated about by a paternal, not to say Puritanically paternal, government, but there are drawbacks also—one does not always wish to be virtuous by act of Parliament. Still, if the legislation can be brought to bear upon worms, we will not complain.

An eminent Philadelphia physician, visiting Boston, was struck with an inscription in the Public Garden, "Dogs forbidden to swim in this pond on Sunday," and remarked that he knew that education had been carried to an advanced stage in Massachusetts, but he had not learned before that even the dogs had been taught to read! How delighted we should be to learn that the Gypsey Moth has been warned off by the General Court. So far we of the South Shore have been left to cope, somewhat ineffectively, I admit, with our own insects, but if the famous moth finds us out we may expect the government myrmidons at its heels, and let us hope that they will carry the Web-worms with them. But a commission ramping about the fields, even for so praiseworthy a purpose, has its terrors.

Another discouragement comes in the worm which saws off the small branches of the Oaks and leaves the ground strewn with twigs, as after a storm, but that supercilious insect disdains trees the size of ours, and he is still to be anticipated.

Upon some of the dwarf evergreens we have discovered a white scale insect, something like a Mealy-bug, which covers the trunks and branches with its white spots, but that seems to yield to the dissuasive effects of soap and water, and disappears after a good scrubbing.

The Hemlocks are to be watched with a new anxiety since the newspapers tell us of a worm that is destroying the foliage and killing the timber in Potter County, Pennsylvania. This creature infests the trees in great quantities, to the dismay of the lumbermen, who are unable to destroy them. It is hard enough to persuade a Hemlock to grow anyway, but if a beast is lying in wait to devour it, we may as well give up altogether. I am told that there is a book as big as the Bible, published by the Agricultural Department in Washington, about nothing in the world but the insects injurious to forest-trees, which seems enough to discourage the planters, even of a wood that can be covered by a pocket-handkerchief like our own; but, to crown all, we rashly took a Brobdignaggian in the tree-line to walk in our Lilliput one day—a Brobdignaggian to whom the largest Elm in Hingham is but a walking-stick—and, looking down upon our three-inch Oaks, he complained that there were not trees enough! *Lucus a non lucendo*—fancy a forest with that deficiency! Having, moreover, discovered that our favorite Beeches were Black Birches, he contrived to impress us with the fact that the best of our forest was the prospect, and that, when the trees were grown, we should not even have that! That Brobdignaggian was a terror! Luckily he had not much daylight to see the place in, or we should never have the courage to go on, for, wherever we had a good-sized tree he advised that it should be cut down, and if there was a square inch of territory without a seedling he thought it would be a good plan to put in a handful; and he even showed a disposition to discredit our crack story about a yield of forty bushels in the palmy days of our great Pear-tree, Methuseleh, but that may have been because we tried to make him believe they were barrels.

So much for taking a Man-Mountain into Lilliput. I would not have trusted that one alone upon the premises with a pair of scissors, for there is nothing less to be depended on than the cutting mania. Granted that one ultimately accepts the situation, the moment when your tree comes down is always one of anguish. It takes so long to grow, and is so easily destroyed. Our Brobdignaggian took his toll at last, for he pointed out the fact that the flourishing little Elm I have been cherishing to shade the seat in the Box-arbor from the noon-day heat, was really injuring the Box, and should come down, which it did forthwith, as a tribute to his superior knowledge, a nice little tree, too, that it would take ten years and more to grow again.

We have another disturbing visitor who insists upon a vista, which involves the sacrifice of a fine clump of Lilacs and Buckthorn that shuts off a view of the northern part of the place. We are disposed to think that it would be an improvement to get a glimpse of the great Elm-trunk and the green grass beyond; but, suppose we do not like it when the bushes are down, what then?

Even given on his part the best artistic perception, does it follow that another man's views of what you ought to like always suit your own?

May it not perhaps be wiser to work out your own problems in your own way? Human nature is so constituted that it yearns for authority, and when it gets authority it chafes thereat, and each man cherishes his own unwisdom as dearer than the knowledge of another. Such contrary beings are we that it is always what we have not that seems the greater blessing, and we seldom know when we are well off. The hardest state of mind to attain is content, and so little do we know the essence of happiness that finding the contented man we forthwith compassionate him for his lack of ambition, or gird at him for supineness, and pride ourselves upon our own divine unrest.

Even thus do the educating influences of the garden lead us round to philosophy, and the vista through the bushes opens out a moral perspective.

It is only by what we suffer that we learn what is worth while, and, judging by the amount of suffering our amateur gardening gives us, we ought in time to have the wisdom of Solomon, which, ranging from the Cedar of Lebanon to the Hyssop on the wall, must have given him a good deal to undergo. No wonder that he discovered that "all is vanity." Probably it was borne in upon him by finding a borer in his own pet Cedar, or a caterpillar crawling over the remains of his last Hyssop.

We, struggling along after that illustrious gardener of Israel, have at least mastered one lesson, the important one that Nature, the rudest of task-mistresses, takes pains early to impress upon her pupils, sternly reiterating,

I teach by killing, let the others learn!

Hingham, Mass. *M. C. Robbins.*

Dijon.—II.

THERE is but one real park at Dijon, and the fact is shown by its name, which is simply "The Park." It was begun in the year 1610 as a private pleasure-ground for the "Great Condé," who was then Governor of Burgundy, and was designed by Le Nôtre. Thus the memories of two men, each the greatest of his time in his own path, unite to give it unusual historical interest; and it also has peculiar artistic interest from its unlikeness to the designs with which we generally associate the name of Le Nôtre. Here are no marble terraces and sculptured fountains, no clipped avenues and arbors, no formal yet intricate paths and ornamental beds of color. Regular though the design is, it is extremely simple, and now that the trees have attained gigantic size and the picturesque outlines of age, the park gives, as a whole, an impression of peacefulness and sober but almost artless charm. This impression is enhanced by the fact that, as is the case with most parks in provincial towns which lie at a distance from the busy streets, it is almost always empty except on fine Sunday afternoons and holidays. Even when we visited it, on a lovely Sunday morning in July, no carriage-wheels but our own were heard, and only two isolated pedestrians broke the wide stillness by a footfall on the gravel paths. I doubt whether at the most favorable times this park is very full of life; for it is so far away from the centre of the city that only energetic walkers can reach it on foot; and, moreover, the natural environs of Dijon are so lovely that such walkers may well seek refreshment there rather than in the place which, while thinking only of his own pleasure, *le grand Condé* was preparing for the populace of to-day.

An avenue of about three-quarters of a mile in length leads to the only entrance of the park from the south-western gate of the town. It is planted with four rows of trees, of no great age, and, unfortunately, unsymmetrical aspect. Among them I noticed Lindens, Horse-chestnuts, Ashes, Locusts and two kinds of Maple, *Acer campestre* and *A. platanoides*. But about midway of its length occurs a large rond-point, with a big basin in the centre, and from this point on the planting has been done with Elms alone, and the effect is consequently better. All this, however, is modern work—*le grand Condé* felt no impulse to join the city to his park by a wide public highway. It is only when we approach a great monumental gate-way, opening in a high wall, that we see traces of the work of the great seventeenth-century gardener. From this gate-way runs a very wide, straight avenue, at the far, dim end of which we barely discern the shape of a picturesque little château. This avenue, half a mile or more in length, is forbidden to wheels, although on each side of its broad central strip of turf runs a road quite wide enough to receive them. Carriages may follow the road which, under thickly overhanging trees, encircles the park at its outer edge, but all other portions must be visited on foot. However, it is no hardship to walk in weather such as central France can give us in July, and the sunny quietude of the stately scene is so enchanting that one hardly wishes for the gay coaches that in Condé's time doubtless enlivened all parts of the enclosure. After walking a while we begin to feel, too, that in Condé's time the place itself cannot have been nearly so beautiful as now. For we see that it is rather a wood traversed by straight roads than a park in the modern sense of the word; and, of course, a wood in its youth has little of the beauty, and none of the majesty, which characterize one where two centuries have developed the trees to magnificent proportions, and yet have broken few gaps through their ranks. The full sense of the special character of this park is not obtained, however, until one reaches a great circular space, half-way up the avenue, whence twelve straight roads diverge in as many different directions. Often in other old parks, as notably in the one at Dresden, we find a central avenue flanked by masses of trees too close for the eye to penetrate, beyond which might lie a genuine forest, but beyond which really do lie open lawns and sunny paths and flower-beds. From the central space in the park at Dijon, however, we see down the twelve radiating roads nothing but unbroken walls of foliage supported by gigantic trunks sheathed with luxuriant Ivy. Only a bit of blue sky shows at the end of each perspective, and the forest-aspect is enhanced by the fact that all the roads are turfed. Twelve great stone seats encircle the open space, alternating with the debouchments of the roads. Thus, the design of the park may be compared to that of a great wheel, with the outer drive for the tire, the twelve grass-roads for spokes, the central area for the hub, and all the spaces filled by a thick growth of ancient trees. Otherwise there is nothing to be described, save a few small paths, which, on the side by the river, run from the outer drive toward the twelve

roads, and here and there open into little irregular glades which cannot be dignified by the name of lawns.

But there is a river-side to the park, and this is really its main point of interest, giving it a variety and charm so great that one never thinks of its design as being monotonous or tame. From the beginning the little far-off château has asserted its importance in the scheme, attracting the foot as well as the eye, and giving an artistic reason for the long avenue perspective; and, as we approach it, curiosity is whetted by the discovery that it cannot be reached—it lies on the other side of the narrow river Ouche. But, to emphasize the fact that this is the picture we have been brought to see, the encircling drive here widens out into a fine terrace, over the edge of which we may look down along a massive water-wall, fringed with flowering plants, into the yellow stream below. Condé called the château *La Colombière*—the "Dove-cote"—and, to enhance its attractions, caused the park to be laid out, probably using it as a hunting-lodge or summer villa in agreeable contrast to the tall, grim, medieval pile which was his official residence within the town. Just what it is to-day I cannot tell, or whether tourists, more enterprising than we, could have found an easy way to it and a pass-word to unlock its doors. In that golden Sabbath stillness it seemed pleasantest to think of it as a sort of enchanted home of sleeping princesses, ignoring certain prosaic signs which seemed to imply some not very dignified sort of modern serviceableness. A little to the right of the château lies a little island in midstream, crowded with those tall spiring Poplars—not Lombardys, but Black Poplars lopped of their large branches, and feathery to their lofty tops—without which no scene would look truly French. The clipped hedges too, which are almost equally characteristic of the land, although they do not occur in the park itself, surround the château and give it dignity and charm together. And right and left, as we lean over the low balustrade, the eye can follow the pretty stream lying deep between its verdant banks, and see, off the soft, blue hills beneath, a sky almost as brightly blue as our own country shows us in July.

A great majority of the trees within the park itself are Horse-chestnuts and Elms, and it was here that I first discovered what a Horse-chestnut might become. "A symmetrical tree with a compact round head"—thus it is described for us in botany-books and horticulturists' catalogues, and thus we usually see it, not only in America but in Europe too. But here, where it has grown in masses, and for generations, its aspect is so entirely different that no one, seeing the size and outlines of these Dijon trees, and not seeing their foliage, would be likely to fit them with their proper name. Along the grass-roads especially, as one viewed them from the central space, they rose to an enormous height, with broken outlines and huge pendent branches, now revealing a great reach of massive trunk, and again concealing it by luxuriant irregular cascades of foliage. No more unpicturesque tree could be imagined than a "fine Horse-chestnut," as we commonly understand the term; but I have never seen trees more picturesque than the old Horse-chestnuts here.

New York. *M. G. Van Rensselaer.*

Foreign Correspondence.

London Letter.

Aristolochia grandiflora is now finely in flower at Kew, a plant of it having been kindly presented by Mr. Sturtevant, who found it two years ago in a garden on the Hudson River under the name of *A. pelicana* (see Garden and Forest, vol. iii., p. 596). Until Mr. Sturtevant's plants came I do not believe the true *A. grandiflora* had been in cultivation in England for many years, the commoner *A. ornithocephala* being generally grown under that name.

In the house here devoted to *Victoria regia* there is a very vigorous plant of *A. grandiflora* with about twenty flowers and buds upon it, and the large, long-tailed, extraordinary-looking blooms hanging from the roof over the great tray-like leaves of the Victoria have a particularly striking effect. As a stove-climber for large houses this Aristolochia has quite exceptional claims. It grows very freely in a moist, unshaded house.

Mucuna atropurpurea is an annual attraction in the large Palm-house at Kew, where it is now at its best. Like the majority of the perennial species of this genus, it grows very vigorously, its Bean-like shoots extending many yards along wires or anything else that they can entwine themselves round. The leaves are large, ternate, and covered with a silky tomentum; the racemes are axillary, pendulous on cord-like stalks a foot long. Each raceme is about as large as a pound-bunch of grapes, and is made up of about twenty flowers, each two and a half inches long and colored blackish purple. They last a long time, and are copiously produced by healthy plants. The bean-like pods of this species are coated with prurient hairs, which are celebrated as an anthelmintic known as cowage or cow-itch. The species is a native of the East Indies.

Gourds as Stove-climbers.—The attractiveness of the Water-lily house at Kew at this time of year is largely due to the tropical Gourds, which are planted in a shallow border all round the house and trained along under the roof, from which the fruits now hang in great profusion. Luffas, including *L. gigantea*, which has a cucumber-like fruit five feet long; the large Bottle Gourds; the Trichosanthes (Snake Gourds); the brown reticulated Sikkim Cucumber, with yellow, crimson, orange and variegated Cucumis and Momordicas, are now at their best. They are as attractive in colors as the most brilliant flowers, and they are a novelty to many of the thousands of visitors who come to Kew daily, and who "have never seen such queer-looking cucumber things before."

Aerides Lawrenciæ and *A. Sanderianum* are merely forms of one species, and that a very beautiful one. The flowers are the largest of all Aerides, and their colors are pretty. Both kinds grow as freely as their ally, *A. odoratum*, and flower as regularly. Frequent importations of them are made chiefly by the Messrs. Sander & Co., in whose nursery a fine lot are now in bloom. Each flower is at least twice as large as the flower of *A. odoratum*, and colored white or cream-yellow, with the segments tipped with bright amethyst. The form named *A. Lawrenciæ* by Professor Ruchenbach was described by him in 1883 as "the best and most beautiful Aerides ever introduced," and it was shortly afterward sold by auction for thirty-five guineas, the purchaser being Sir Trevor Lawrence.

Lemoine's New Gladioli.—These are now a handsome feature in our bulb-border, and promise to remain an attraction for some weeks to come. They are fulfilling all that their raiser predicted for them—namely, hardiness sufficient to enable them to withstand the cold of an English winter, floriferousness, and constitution which is easily accommodated by the most ordinary soil. That their flowers are large, distinct and beautiful goes without saying, and the question, Are they equal in beauty to the Brenchleyensis section of Gladioli? is answered differently by different cultivators. Certainly the two sections fully merit favor just as Tea Roses and Hybrid Perpetuals do. We grow a representative collection of both, and now that we know the good qualities of Lemoine's Nanceianus seedlings we should not willingly discard one of them.

Interesting Combinations.—An attractive large bed along one of the principal walks at Kew is made up of compact bushes of *Olearia Haastii* and Tiger Lilies. They are in flower together, and the gray foliage and white flowers of the Olearia are a capital foil to the bright orange of the Lilies. Another bed is formed of small bush Rhododendrons and *Lilium Canadense;* another of American Azaleas and *L. superbum*, while *L. auratum* is grown in large quantities among various kinds of shrubs. The effect of these large masses of Lily-flowers could not be easily surpassed, and their perfume makes the whole garden pleasant. *L. candidum*, which is usually a failure at Kew, has done well here this year. *L. longiflorum* is also very fine; in fact, the Lilies generally are better than they have ever been. This is probably due to the moisture and coolness of the present summer.

Carnations are now more popular than ever before. The number of named kinds in English gardens is legion, and it is somewhat remarkable that fanciers of these plants can find marks of distinction in every one of them. They are not every man's plant, or rather it would be more cor-

Fig. 65.—Northern Pitch Pine (*Pinus rigida*).—See page 397.

rect to say the different varieties cannot be cultivated in the same garden—those kinds which thrive in one place failing in another. A remarkable fact in relation to seedling Carnations is their dying out after a few years' cultivation, or, if they do not die out, they revert to some inferior form. Of course, many are stable enough in character. The raisers of new seedling Carnations send their most promising kinds to be cultivated in the trial grounds at Chiswick, side by side with those of established reputation. These are examined annually by a committee of experts, who award marks or certificates to the best. The list of certificated new kinds is published in the *Journal of the Royal Horticultural Society*, and in this way growers are made acquainted with the best new seedlings as tried at Chiswick. The examination of Carnations, Annuals, Peas, Beans and several other classes was completed last week. Tomatoes will be examined shortly. Meanwhile, the exhibition of these plants under first-rate cultivation, in a large house set apart for them, is both interesting and instructive. A house over a hundred feet long by thirty feet wide is entirely filled with Tomatoes, two of each kind being grown and labeled with the raiser's name. The gardens in which these trials take place are open to the public as well as to the Fellows of the Royal Horticultural Society.

Kew. *W. Watson.*

Cultural Department.

Some Hybrid Gladioli.

MANY years ago I obtained bulbs of *Gladiolus purpureo-auratus*, and at once began to raise hybrids between this species, then new, and the Gandavensis varieties, and had several sorts when Monsieur Lemoine first offered his hybrids for sale. Among the first seedlings were Alguacil and Corporal, which I still regard as worthy of a name and place though raised so long ago; indeed, Corporal, to which the Massachusetts Horticultural Society awarded a first-class certificate in 1884, is still the brightest of all my varieties. I mention this to show that there is a strong element of chance in hybridizing operations; the first attempt may produce results which thousands of subsequent seedlings may not surpass. Nevertheless, every year has added to my collection, which now numbers, of the Lemoinei strain, sixty-four varieties, all sufficiently distinct to be recognized. Not all which have been named have been preserved, for when a seedling has appeared of the same general appearance as a named kind, the stock of the latter has been sacrificed and its name and number given to the new-comer.

Of a lot of seedlings more than half will have the form of *G. purpureo-auratus*, that is, hooded over at the top by the strong curvature of the upper petal. This form is generally accompanied by a uniformity of color, red or purplish red, with a crimson blotch on the lower petal, which is tipped with a greenish yellow. Yet I have seen three of this shape which I think are good enough for any collection: Lemoine's Sceptre d'Or, which is a fine, clear, yellow flower; Lemoine's Masque de Fer, a bright red flower whose two lower lateral petals are black, with a bright yellow point in the centre of each; and a seedling, probably from the latter, which appeared among my plants two years ago; it is exactly like its supposed parent, except that every division of the flower is edged with a fine white line.

A great many of the seedlings produce flowers of a broad open shape, which, combined with their color, has caused them to be compared to magnolias, not, I think, a very close comparison. These are mostly of a pink, red or purple color. Some of the best I have of these are Condesa (F. C. C., 1884), a large flower whose color is much like that of a well-ripened water-melon, and Centurion, which is deep red, of an orange cast, the lower petals being crimson and black.

Another class combines the colors of the first section with a much more open shape. Many of these are very good, as their tints are brighter and the yellow of their lower petals is devoid of greenness and is sometimes changed for pure white, as in Prince Regent (F. C. C., 1886). Admiral is another good one of this class and is a remarkably strong grower. Autocrat and Steward are also worth growing.

A fourth class has flowers about as widely opened as the Gandavensis kinds, and a ground color of light buff or salmon (I have never seen a Lemoinei variety with white ground), blotched heavily on the lower central petal or the lower lateral one. Many of these may be seen at horticultural exhibitions, and I raise a large number every year. Of this class I have added to my list Principessa, which is a tall variety with a purple throat, La Duquesa, with cherry and yellow blotch, and Umpire (F. C. C., 1887), whose two lower laterals are brownish red. It is, perhaps, worthy of remark, that the stems in classes one and four are usually tall and slender, and in the others more like those of the Gandavensis sorts.

These four classes will be found to include over ninety per cent. of every large collection of seedlings of the Lemoinei strain. Anything really new and striking must come from the small residue, such as Suffragan, a very small red and yellow flower, which most people would not like, but so brilliant that I still keep it; Pontiff, which frequently has all six segments tipped with yellow and the lower one grained with narrow parallel violet lines, and M. Levèque (Lemoine's), deep crimson-purple throughout. I sow the seed of well-opened flowers only, yet more than fifty per cent. of the seedlings prove to be of the *purpureo-auratus* type; how strong and vigorous must the influence of that species be to appear so abundantly for nearly twenty years, though not but once in all that time has a flower of that shape furnished seed for my sowing.

My experience with Monsieur Lemoine's Nanceianus strain has not been great, but from my observation I should say that their value lies more in what they promise to be than in what they are. The complaint that they have but one flower in perfection at a time does not appear to me to be well founded, for I have to-day counted six perfect and gigantic flowers on the variety Comte Horace de Choiseul, and three pale-pink flowers, not yet withered, occupied the lower part of the same spike; fading is the defect of this otherwise fine flower. President Carnot also fades, though not so badly; but the graining and mottling, which is delicate and beautiful in the parent Saundersi, becomes coarse and displeasing in this. In others the shape is objectionable, being too wide for its height. No doubt, these and other defects will be absent in seedlings yet to come, but I do not believe that Nanceianus or Lemoinei, or any other strain, will ever attain the excellence of the Gandavensis tribe.

Canton, Mass. *W. E. Endicott.*

Spring-flowering Bulbs.

THE first spring-flowering bulbs are now making growth in the border, and this may be considered a warning to plant this class of bulbs as soon as possible. None of my other bulbs rest for so short a season as those of the Taurian Muscari, which, having remained dormant scarcely a month, in the middle of August have made leaves some three inches long. An examination will soon show that many bulbous plants are slowly commencing to move, and, of course, if such bulbs are kept unplanted valuable time is lost to their detriment. Bulbs, corms and rhizomes are always rather mysterious things, and a general collection proves of constant interest, and is no small care, until their habits are well known. Between the accommodating ones which can be persuaded into growth and flower by a little moisture at any season, and the obstinate ones which refuse to grow until a certain season of the year, there is a wide difference with many variations and with all manner of vagaries.

However satisfactory those plants are which grow and bloom with regularity and small care, to one with a spirit of garden adventure in his veins there is great fascination in the cultivation of unreliable and difficult subjects, such as the Oncocyclus Irises of which Mr. Orpet wrote last week. This fascinating group interests me very much, and after some experience I have sometimes thought I knew how to grow them, and then again I have concluded that they are capital subjects to humble one's pride in his cultural skill. It is very well understood that, given certain protection, so that conditions of growth may be controlled, a fair proportion of these plants may be expected to bloom, but some of us have too little time in the garden to watch pots and frames, and we wish to grow hardy subjects in the open. Certainly the Oncocyclus Irises are hardy and do bloom well in the open sometimes, and it would be interesting to know, in a general way, the proper conditions. The first *I. Susiana* I planted made a strong growth in the fall, and with other things in a south border was covered with hard forest-leaves, and in the spring flowered strongly. Since then I have grown numbers of them by the most approved advice, and the result is generally unsatisfactory. Pots were tried last season, an experiment I shall not repeat. I grow about a dozen kinds of Oncocyclus Irises, and they are all equally uncertain as far as culture is concerned. They are all beautiful in flower, however, and well worth

growing, though, like the fisherman's trout, their beauty is somewhat enhanced by the difficulty of securing them. The reign of *I. Gatesii* as the finest of this family was rather short, as we already have a successor in *I. Lorteti*, which is now said to be "the most beautiful Iris ever introduced." It is something like *I. Gatesii*, but with lovelier tints.

Not every one is willing to devote time to plants which require care, and, fortunately, the general run of commercial bulbs, as Daffodils, Tulips and Hyacinths, require little or none. This note may serve to remind some reader to secure at once a liberal supply for the coming year, for the planting season is over all too soon.

Elizabeth, N. J. *J. N. Gerard.*

Cycads.

MANY of these plants are valuable for a certain boldness of effect, some singularity in growth, and they often have tough foliage, which stands well under rough usage. In general, the Cycads grow better in a warm house, but this is not essential for all of them; the well-known *Cycas revoluta*, for example, will flourish under ordinary conservatory treatment in winter, and through the summer it can be used for out-door decoration. Nor are they exacting as to soil. A good loam, somewhat sandy and slightly enriched with old manure, will satisfy them, and they should be potted firmly. They should be drained well, watered freely while they grow, and less abundantly, of course, in winter. They are not very liable to insect pests unless much neglected, their chief enemy being scale; this may be readily removed by the usual methods.

C. revoluta, popularly, though erroneously, known as the "Sago Palm," is, doubtless, the most frequently seen in cultivation, since it has been imported from Japan and China in very large quantities of late years. The stems, of various sizes, from six inches to six feet in height, are denuded of leaves and roots and then boxed up like so many logs of wood, and thus shipped to large dealers in the United States and Europe. These stems possess much vitality and seldom fail to grow after such harsh treatment, unless they have been exposed to frost or otherwise ill-treated in transit. Our recent fashion of using the leaves of this plant in funeral decorations is not a novel one. A similar custom was popular in Saxony fifteen or twenty years ago.

C. circinalis, though not nearly so often seen as the foregoing species, is perhaps the handsomest member of the genus. It has long, graceful, pinnate leaves, which sometimes attain eight to ten feet in extreme length, the pinnæ being falcate and from six to twelve inches in length, dark green and glossy on the upper side and paler beneath. The stem is stout and somewhat similar to that of *C. revoluta*, and it seldom branches, except when extremely old, the branching habit being said to be more common in the male plant than the female.

Another handsome species is *C. Rumphii*, which, when small, bears some resemblance to *C. circinalis*, although it becomes more distinct as it attains age. *C. Rumphii* has a slender stem, from which is produced a crown of pinnate leaves that are from four to six feet long. The pinnæ are narrow, lanceolate and pale green, and rather thin in texture. This species is a native of the Indian Archipelago, and, though elegant in appearance, is hardly equal to the preceding.

Dion edule, another interesting member of the family, has a strong constitution, and is capable of withstanding much neglect. It is a native of Mexico, and has a stout, rough stem, from which are produced a number of stiff, pinnate fronds, the pinnæ being smooth, dark green and sharply pointed, and the lower part of the leaf-stalks being clothed with short, white, woolly hairs. This plant will grow in a cool house, and may also be used to advantage out-of-doors in summer, since the leaves are not easily injured.

Encephalartos villosus is also a fine plant, and in general characteristics has much in common with the Dion, but makes a finer specimen. All the species of Encephalartos make stout short stems, and make them slowly, too, and *E. villosus* produces a number of fronds at a growth, as is the habit of the Cycas. These leaves are from four to six feet long, pinnate, with pinnæ from six to eight inches long, the edges of the latter being spiny, and also terminating in a spine. The stem and crown of the plant are also more or less covered with tomentum of light color.

E. Altensteinii is another admirable member of the genus, and in a general way resembles the preceding, but the base of the petioles is much swollen and the leaves are more widely spread. *E. Altensteinii*, in common with the other members of this genus, is of African origin, and may be used out-of-doors in summer, though such treatment may retard its growth somewhat.

The Zamias, too, include several handsome plants among their thirty-odd species, one good species being *Z. furfuracea*, a stove-plant from Mexico, which bears pinnate leaves about three feet long, the pinnæ being broad and rather irregular in outline. The leaflets are stiff and leathery in texture, and, as the varietal name indicates, the plant is inclined to be scurfed with brownish tomentum. There are also some very handsome species among the Macrozamias, a genus closely allied to the above, notably fine sorts being *M. plumosa*, with slender semi-erect leaves and long pinnæ, *M. Miquelli* and *M. spiralis*, all of which are worthy of a place among select foliage plants.

Holmesburg, Pa. *W. H. Taplin.*

The Blackberry Crop.

FIVE years ago it was hardly possible to recommend any Blackberry as having the essential elements of a fruit good for market or home use. Now we have fairly well tested these first-rate berries, the Snyder, the Agawam and the Taylor. Perhaps our best plan would be to take this list and reverse it for planting. The Taylor is a noble berry. The Agawam is somewhat smaller and delicious. Both are sweet and both are hardy. Snyder is absolutely hardy and a fairly good berry. There is not much difference in these three sorts so far as prolific bearing is concerned. The quality of the two first named is decidedly best. I am also confident that Snyder needs a soil more moist and cool to give good crops. It dries up more easily in a time of drought. I find it gives me very fine crops at the foot of a slope in rich strong soil; whereas Taylor and Agawam give me fine returns from all soils. However, all Blackberries are easily injured by very dry weather. This must not be misinterpreted to imply that the Blackberry can be grown on wet lands, for it cannot.

In order to receive the largest and best crops I have adopted this plan of growth: For two years after setting I cultivate with harrow and hoe; then I let the berries take possession of the land. They will keep out the grass and weeds without help. I allow the canes in such a field to grow till fall, when I cut them back to five or six feet. The old canes are left till spring, as they help to prevent crushing with snow. This plan of culture is, I know, sharply criticised, but I have tried all ways, and am satisfied that it is best for me. I presume those who grow largely for market will find the difficulty of picking such a field too great. But the plan of growing in rows will be also formidable for home culture. The Blackberry is a ferocious plant.

Besides the three sorts named, I have experimented with Wilson and Wilson Junior, both of which are too tender north of New York, though both are delicious when they can be grown. The old Rochelle, or Lawton, is also useless at the north, although all improved sorts pass in market as Lawtons. Kittatinny is a fine berry in size and quality, earlier than Lawton, which was disseminated as long ago as 1865, but it cannot be relied on as hardy year after year. I get a crop once in three or four years. I have rooted out all but a corner where they are allowed to grow for sake of the good they tried to do. Wachusett's Thornless is small, fairly good, but not entitled to much space. Dorchester is so wholly superseded as to need no further reports. Erie is also to be set down as having no claims for general planting.

The Dewberry has so far failed to develop more than one or two sorts adapted to cultivation. The Lucretia is the best that I have tested. It is not quite hardy, but, for all that, generally furnishes a fair crop of superb berries. It begins to ripen July 20th, or a little earlier. This is two weeks before the High Bush. As a market fruit it is very taking, and if it can be obtained without too much trouble it is profitable.

The demand for blackberries is very large, and it is growing. The wild berry can now rarely be obtained. The chief trouble has been with the sourness of unripe Lawtons and Kittatinnys. When not dead-ripe, these berries are poor enough. As consumers get a taste of the sweet sorts, they ask for them and buy greedily. It is not, however, a crop to plant extensively, except on land which is unsuited for anything else. The best plan is to have a variety of small fruits; with Blackberries much less abundantly planted than Raspberries.

The crop this year is excellent, both in quality and in quantity. For home use, no fruit is more wholesome or delicious. It is first-class for cooking, canning and for dessert. The cultivation of the best sorts should be encouraged, from a sanitary point of view, as a most wholesome summer food.

Clinton, N. Y. *E. P. Powell.*

Correspondence.

"A Massachusetts Forest."

To the Editor of Garden and Forest:

Sir,—Mr. Baxter's enthusiastic article about the Blue Hills of Massachusetts (in your issue for August 5th) prompts me to urge again the creation of one general board of commissioners endowed with power to take lands for park purposes in any of the twenty municipalities which compose Greater Boston. These eight cities and twelve towns possess a million inhabitants and more than a thousand million dollars' worth of taxed property. The whole district needs to reserve at once numerous small plots of land for squares and breathing-places; and for country parks not the Blue Hills only, but the Fells and some other wild lands as well. These needed reservations will never be secured unless the several municipalities will unite for the purpose. Let the next Legislature frame an act naming a metropolitan park commission and giving it power to take lands regardless of town and city boundaries. Let the act provide money for the purchase of lands by means of a state loan to be repaid in fifty years by the interested towns. Then let the act provide that it shall take effect and the commission come into existence only when a majority of the votes cast at special elections held in the twenty municipalities shall be yes votes.

A tax levied on a growing thousand millions at the rate of a tenth of a mill on the dollar would in fifty years yield more than enough to pay off a loan of five millions spent in the purchase of lands to-day. Five millions would to-day buy sites for at least fifty squares averaging five acres, together with ten thousand acres of wild lands distributed between the Fells, the Blue Hills and other quarters. Another tenth of a mill on every dollar would provide a hundred thousand a year for road-building and maintenance. Thus easily can Greater Boston save, if she will, her reputation as the most beautiful and most enlightened city in America.

Boston. *Charles Eliot.*

[This letter should have appeared in last week's issue, which contains an editorial allusion to it.—Ed.]

The Florists' Convention.—I.

Extracts from Papers Read.

THE seventh annual convention of the Society of American Florists was held at Toronto last week. The society had never before met without the limits of the United States, and the courtesies extended to the members from this side of the boundary by the local clubs and the city authorities made the convention a most agreeable one in its social features. The addresses of welcome by the Mayor and Alderman Hallam were particularly happy, and the response by Judge Hoitt, of Nashua, New Hampshire, contained fitting allusion to the services rendered to horticulture by English societies and Englishmen. The visitors received the most cordial attentions, and the garden-party, with the accompanying banquet in the beautiful suburban grounds of Alderman Hallam at Chorley Park, 'deserves mention as an example of hearty hospitality. Mr. James Allison, Chief of the Department of Manufactures of the Columbian Exposition and acting head of the Department of Horticulture, was present throughout the meeting, having come at the request of Director-General Davis to report the progress made in organizing the World's Fair and to invite suggestions as to the best means of securing an appropriate representation of the horticulture of the country at the exposition. A committee was appointed to report on this subject, and they recommended the necessity of immediate action, as the time was already too short for securing the proper growth of plants for exhibition. They also recommended that arrangements should be made for ample out-door space for gardening, and they advised the managers to invite the owners of private conservatories to make contributions of specimen plants for the display. Mr. John Thorpe, the first President of the society, was unanimously recommended as a suitable man to take charge of the interests of floriculture at the exhibition.

The work of the year specially commended in the report of the Secretary was that of the Committee on Nomenclature, whose members have taken great pains to secure accuracy in the naming of garden-plants, and especially to reduce the number of synonyms. The officers elected for the ensuing year were James Dean, of Bay Ridge, Long Island, President; William R. Smith, of the Botanic Gardens, Washington, Vice-President; W. J. Stewart, Boston, Massachusetts, Secretary; Myron A. Hunt, Terre Haute, Indiana, Treasurer. The next annual meeting is to be held at Washington.

Extracts from some of the more important papers read at the meeting are given below:

THE PRESIDENT'S ADDRESS.

President Norton, in his opening address, stated, as a gratifying fact, that the membership of the Society was still increasing, and that there was more money in the treasury than there had been at any time since the organization of the Society, seven years ago. Nearly 1,000 names are found now on the roll of the Society, and the number of new members who have joined during the early part of this year is much larger than that of any previous year in its history. Mr. Norton alluded to the present tendency of growing specialties, and he attributed the excellence which had been attained in the growing of special plants like Roses, Carnations, Violets, Chrysanthemums and the like, to the devotion of florists to individual flowers. This excellence was more manifest in the market, because growers took care to reject poor blooms, culling them out and throwing them away, so that the improvement in the general quality of those plants which were sold has been very marked.

During a year or two past certain flowers have brought much higher prices than ever before, and this illustrates the truth that people are always willing to pay the highest price for good quality, so that the extra pains required in growing the best plants and in preparing them for the market always has its reward. Wholesale dealers have no trouble in disposing of such stock, and in spite of its high cost is more readily sold than flowers of inferior quality.

The President congratulated the Society upon the improved methods of arranging cut flowers. The loose, natural way of putting them together with long stems and healthy foliage and with an eye to soft harmonies and contrasts of color, and the habit of using only a few colors in each basket, is a vast improvement upon the style of a few years ago, when matches, corn-broom and wire were considered indispensable factors in making up designs, and when an infinite variety of flowers of all colors was packed stiffly together.

Mr. Norton recommended that ampler opportunities should be afforded to women for going into business as florists. In retail stores especially they have been found exceedingly useful, not only as book-keepers and cashiers, but in waiting upon customers and filling orders. Their correct taste and aptitude for recognizing the beautiful in form and color makes their services of value as artists and designers. Many women to-day throughout the country are doing profitable business on their own account, and there is room for many more in an occupation so pleasant and for which they are so admirably fitted in refinement and taste.

It was said to be an appropriate work of the Society to encourage in every way public exhibitions of plants and flowers. There is no better way of advertising for the trade than by displaying florists' productions at such exhibitions. It educates public taste and creates a demand for florists' products. Horticultural exhibitions which are supported mainly by contributions from private collections are very creditable, but the exhibitions are always better when they are supplemented by the stock of commercial growers.

REVIEW OF NEW PLANTS.

This was the subject of a long paper compiled by Mr. William Falconer, of Glen Cove, New York, from reports on various classes of garden-plants made by recognized experts in special fields. Thus the lists of Hardy Perennials were prepared by Mr. Edward Gillett, of Southwick, Massachusetts, and Mr. George C. Woolson, Superintendent of Planting in the New York City Parks. The best new Chrysanthemums were named by Mr. Edwin Lonsdale, Secretary of the National Chrysanthemum Society. The lists of new Begonias were made by John Saul, of Washington; J. N. Gerard, of Elizabeth, New Jersey; F. T. M'Fadden, of Cincinnati; Mr. E. G. Hill, of Richmond, Indiana; Henry A. Dreer, of Philadelphia; and Messrs. Pitcher & Manda, of the United States Nurseries,

Short Hills, New Jersey. Mr. E. V. Hallock, of Queens, Long Island, wrote of Bulbous Plants; Messrs. E. G. Hill and A. P. Simmons wrote of Fuchsias and Geraniums and so on. The plants named were not all new, but many of them are little known, and the catalogue, with descriptive notes on each plant, is a valuable one. The lists of some of the more important plants are given below.

New French Roses.—Most of these Roses tried last winter proved worthless for growing under glass. Out of nine varieties of Tea Roses I found only one which I considered worth another year's trial. Here are the names of the ones I found of no value: Souvenir de Clairvaux, Comtesse de Witzthum, Comtesse Eva de Starenburg, Jaune Nabonnaud, Maurice Bauvier, Princesse de Sarsina, Souvenir de Lady Ashburton and Souvenir de Madame Sableyrolles. Elisa Fugier, with a white flower somewhat resembling Niphetos, but stiffer-stemed, is the only one I shall try again. Among the hybrid Teas I imported four kinds and shall try three of them for another year. These are Madame Caroline Testout, a large pink Rose of good, firm petals and stiff stem, but not sufficiently double; Triomphe de Pernet Père, a sweet red Rose, but with too much purple in it for a good cut flower, with the form of General Jacqueminot, and a better color would have made it a good rose; Marquise de Salisbury, which only lacks size, and is otherwise an elegant rose; it is a free bloomer, and its flowers are a brilliant velvety red, but entirely too small.—*Ernest Asmus, Hoboken, N. J.*

Bedding Roses.—Etoile de Lyon is showing up well in the open ground. This beautiful Tea succeeds better outside than under glass, and is one of the hardiest of the Tea class. Madame Agatha Nabonnaud is one of the finest bedding Roses and a good grower; color, flesh-tinted rose; buds large and fine. Duchesse Marie Salviate is a beautiful new Tea Rose, and a free grower and bloomer; color, orange yellow, showing red. Madame Pierre Guillot is probably the finest of the new Teas, and is now blooming well in the open ground. The color of its flowers is richer than that of Madame Watteville. Snowflake and Lady Lambert seem to be identical, and so do Dinsmore and Madame Charles Wood. Mrs. Degraw and Henri Plantier are the same.—*Dingee & Conard Company.*

[Note.—As regards Mrs. Degraw: Mr. William Burgess, formerly of Glen Cove, Long Island, and now of Brooklyn, and well known as of Marechal Neil fame, told me that he raised this Rose from seed, perhaps thirty years ago, and named it in compliment to an ex-president of the New York Horticultural Society. Anyway, this Rose has been grown in quantity about Glen Cove for twenty years or more and generally known as Mrs. Degraw or the Burgess Rose, and as such Mr. Burgess exhibited it, year after year, for many years at the Queen's County, New York, agricultural fairs at Mineola. And many rosarians, John N. May among them, who have seen the Rose here, and to whom I sent plants of it, assured me that it was quite distinct from any other Rose. Notwithstanding all this, however, I claim nothing regarding its distinctness.—*Wm. Falconer.*]

New Roses.—Augustine Guinoisseau, a hybrid Tea, is a sport from La France, and similar to it except in color, which is white, faintly flushed with pale pink. In masses or bunches the flowers are admired by every one. Kaiser Frederick is a Tea Rose of the Gloire de Dijon type, producing freely large, very double flowers, with the same coloring as those of Malmaison. I consider this a decided break in climbing Teas, the yellowish salmon tinge common to this class being entirely eliminated. Climbing Perle and Climbing Niphetos, both genuine climbers, throw up strong, vigorous shoots eight to ten feet in length. The Gulf and Pacific states will find these roses great acquisitions.

Madelaine d'Aoust, Tea; color, coppery yellow; petals, heavily edged with white; buds, medium size; growth, moderate; an excellent and distinct bedding Rose. Madame Pierre Guillot, Tea; color, creamy white; petals, edged with rose; buds, large and of beautiful form. Compared with Madame de Watteville, the color is similar; buds larger, more double. Every shoot bears a bud, and has not the Watteville habit of throwing blind wood. Clotilde Soupert, Polyantha Tea: one of the most valuable Roses of recent introduction; it has endured ten degrees below zero planted in the open ground. Waban, a sport from Catharine Mermet; flowers, a very deep shade of rose, with a decided tinge of red on the outer petals; in an even temperature of fifty-five to fifty-eight degrees it produces fine buds; young growths and foliage darker than in the parent, but otherwise it is exactly similar. Our experience with it is limited to the growth and behavior of ten four-inch pot-plants, bedded out in January last.

In the latest European sorts our experience is limited to a few months' growth under glass. Madame Elis Lambert may be described as a medium-sized Marie Guillot, pure white, with an edge of rose on the inner petals, very double, free-blooming, distinct, and a good grower. Elisa Fugier; in form and color of bud very similar to Niphetos; every shoot produces a bud; growth, very vigorous, much more so than in Niphetos; promises well for forcing. Henri Brichard, hybrid Tea; produces very large, globular buds, in color similar to those of Captain Christy, with perhaps a deeper centre; thoroughly distinct, quite different from any in this section, good grower and free bloomer. Triomphe de Pernet Père, hybrid Tea, said to be a cross between General Jacqueminot and the Tea-rose Désir; buds, of fair size, and in style like those of Jacqueminot; fragrant; cherry red; constant bloomer and vigorous grower.—*J. C. Vaughan, Chicago.*

Rose Novelties.—Madame Pierre Guillot, Tea, a magnificent and distinct new Rose, equally good for forcing or for open-ground bedding. This Rose will rank with the finest of the Teas. J. B. Varrone, Tea, is a variety which may be classed as intermediate between Comtesse La Barthe and Luciole. It combines the free-flowering qualities of the former with the rich coloring of the latter. A most distinct and valuable new Rose. Miss Marston, Tea, a large open-shaped flower when fully developed, of the general make and style of Catherine Mermet; a promising new Rose, which will probably force well. Madame Marthe de Bourg, Tea, a distinct-shaped bud of considerable length, somewhat after the form of Niphetos, but differing in color and texture. This Rose blooms well, forces readily, and is of good, sturdy habit.

Other new varieties of the Tea section may be mentioned briefly: Souvenir de Dr. Passot, of very brilliant color, but too thin and scanty in petals, and not large enough; Souvenir de F. Gaulain, a fine, strong, free-flowering Rose, quite double and of good form, but with a decided purplish cast; Jeanne Guillaumez has flowers of beautiful apricot color, but scarcely large enough in bud, very showy when full blown, and quite free; Gustave Nadaud has a bud of bright carmine color, shaded with yellow, long-pointed, lacking in substance, however, and also in distinctness from other varieties; May Rivers and Madame Olga are both very similar to the old variety Ophelia, and not distinct enough from Cornelia Cook.

Georges Farber, Mademoiselle G. Goddard, Madame A. Tarle, Mademoiselle M. Fabisch, Mademoiselle M. Thezillat and Marquis de Foretan are novelties that should not have been put on the market, as they are of no value to any one.

Augustine Guinoisseau, the so-called White La France, is a hybrid Tea. It is admired by many and condemned by not a few as lacking in distinctness of color; it is not white, but it is quite distinct from both the Duchess of Albany and La France. In every respect but color it is a veritable La France, and worthy of culture. Bona Weillshott, another hybrid Tea, is a plant of good growth and great freedom of bloom, but the flower is lacking both in color and form; occasionally it is quite fine, but so few good blooms are produced that it cannot be recommended. La France of '89 is a most distinct and fine Rose. It, however, is not "perpetual" in its bloom, like the hybrid Teas generally. It is semi-climbing in habit and of vigorous constitution, and promises well in form, size and rich coloring. Madame Hortense Montefiore, hybrid Tea, is weak in growth, and the flower lacks size; undesirable. Madame Zea Collogne, of La France type, has a more distinct combination of colors than most others of this type.

Hybrid Perpetuals.—Gustave Piganeau is most distinct and valuable on account of its fine form, large size and good color. These points, together with its great freedom of bloom, place it among the finest of its class. Gloire de l'Exposition de Bruxelles—a very dark crimson-maroon colored Rose, with scarlet shadings. Very full and double and free and fine in habit. Oscar II. Roi de Suede is a very pronounced and distinct Rose; color, cinnabar-crimson, with maroon shadings; of strong growth, and bearing large, handsome flowers. Lady Arthur Hill, James Brownlow, Martin Cahuzac and Maurice de Vilmorin are Roses of promise in this section, and can be commended for trial.

The above hybrids are the most noted ones of the many sent out last year, but the judging has all been done from blooms produced under glass.

Pink Rover.—A Bourbon of the general type and color of Malmaison, but somewhat darker in its shadings; will doubtless prove a useful variety.—*E. G. Hill, Richmond, Indiana.*

New Hardy Roses.—My observations upon the Rose are chiefly with a view to their adaptation for garden-purposes. I can speak of but few this season. Augustine Guinoisseau seems to me an acquisition to the La France group, and likely to prove a valuable addition to this class of Roses. The color is a pale rose or cream, and apparently it flowers as freely as La France, the plant making a similar growth. We have now a trio of beautiful flowers, namely, La France, Duchess of Albany and the above, that will undoubtedly prove of great value for summer-bedding purposes. If we could add to these a pure white, the group would supply a fine quantity of color for the garden. Gustave Piganeau has a flower of the largest size; color, bright carmine lake; habit, good; petal, firm; I confidently expect this Rose to prove an acquisition. The flower is similar to that of the Countess of Oxford. Jeannie Dickson has a striking flower of a bright cheerful color, rosy pink, and, from a single bloom, I am favorably impressed with it. It is another addition to the scentless class of Roses, and, like the Baroness Rothschild, its strength will make it a fine exhibition rose. Lady Arthur Hill is another of Dickson's new Roses; the form of the flower is rarely equaled, the color rosy lilac, and it appears to be a free bloomer.—*Wm. H. Spooner, President of the Massachusetts Horticultural Society.*

Azaleas for Forcing.—Vervæneana bears a large double flower of a rich rosy pink color, broadly margined with white and with a carmine blotch. It is very distinct and free-flowering, and it forces well; indeed, it is one of the best of its class. Imperatrice Victoria is perhaps the most beautiful of the double-flowering Azaleas, with flowers of rosy pink, banded with pure white. The plant requires careful attention during the hot summer months, or the foliage will turn brown and drop. Madame Louis Vervæne is a most distinct variety, with flowers pure white, striped and spotted with rosy carnation tints. Triomphe de Mont St. Amand bears very large double flowers of a clear rose color, with pure white ribbon and a bright carmine spot on the upper segment. The best of the older varieties are Madame Vandercruysen, Simon Mardner, Empress of India, Emperor of Brazil, Bernhard Andreas Sakuntala (if Easter is late), and Deutsche Perle (if Easter is early).—*James Dean, Bay Ridge, N. Y.*

New Pansies.—The old English and Scotch strains that the German seedsmen have taken hold of and subdivided into ever so many varieties remain practically the same under their new names, and I do not see that any improvement has been made in them except in the catalogues where they are rechristened. A really new strain is the Trimardeaux, originated by a florist near Paris, France, but it has been greatly improved since its first production. These Pansies are very large in every way, with very hardy flowers and foliage, enduring well the extremes of heat and cold, and they give general satisfaction all over the country. Another new strain, also of French origin, is the Odier, or fine spotted varieties, which of late years have been greatly improved by the well-known specialists, Cassier and Bugnot, the latter especially introducing new shades of color and flowers which would have been thought impossible a few years ago. These last strains, however, are by no means as hardy as others, owing, I suppose, to closer breeding. These two races are the only really new varieties that have been introduced within the past few years, and that are, in my opinion, of any merit, and I have come to this conclusion after having tried within the past five years everything of note in the Pansy line.—*Denys Zirngiebel, Needham, Mass.*

The Construction and Heating of Greenhouses.

Essays were read on this subject by Mr. John N. May, of Summit, New Jersey; Mr. E. G. Hill, of Richmond, Indiana, and Mr. F. R. Pearson, of Tarrytown, New York. Mr. Pearson insisted especially on durability as an essential quality of such structures, and considered the constant expense for repairing one of the most serious drawbacks to commercial success. He advised the use of a continuous iron rafter, from the ridge to the ground and set in concrete, so that the frame of the house will contain nothing perishable. After explaining elaborately the construction of such a house, Mr. Pearson spoke of certain conveniences, and from this part of his paper we quote the following:

Devices which save labor are matters of prime importance in the greenhouses of commercial florists. In arranging for the application of liquid manure, for example, we have large vats out-of-doors that can be reached readily by carts, so that the labor in handling the manure is small. The manure is dumped into these vats from carts, and water is pumped into them by steam. After soaking for twenty-four hours or more the liquid is drawn off into a side vat lower than the first; two valves close the pipes, one leading to the first vat, and one from the well from which our water-supply is obtained, and the same pipes and the same pump are used to distribute the liquid manure. We have such perfect control of it that we use weak liquid manure regularly once a week, and sometimes oftener, and no more time is occupied than in the regular watering. The amount of labor saved by this will be best appreciated when we state that we can now water the place with four men with liquid manure in two hours, whereas by using cans it formerly took four men two days to go over the place. The difference in cost between the two methods would make a substantial profit alone in twelve months.

In Rose-growing a large item of cost is the annual removing and refilling of the soil in which the Roses are grown. We use small tram car-wheels and dump-cars, the sides of the benches being used as tracks. These cars are made large, and run through the centre of the houses, carrying as much soil as a good stout boy can push, which is more than four boys could carry. When emptying a house, several cars are used, and two or three men are employed filling the cars. As fast as a car is loaded a boy propels it to the end of the house, where it is dumped into a cart in waiting and brought back; during the time occupied in running down the first car a second car is filled up by the same gang of men, which keeps them constantly employed. By the time the second car is filled the first has been emptied and returned, so by the use of two carts to carry the soil away, and two or three cars in a house, the men are occupied constantly, and the greatest economy in labor is secured. Our houses are 304 feet in length, with doors at either end, which necessitates carrying the soil only 150 feet to the farthest point, and this is rapidly reduced as the houses are emptied.

An idea seldom thought of is the location of the walks and the purlines with reference one to the other. We use drip bars, which we consider a decided advantage, as they reduce the drip in a house very much, but the location of the purlines is still a matter of vital importance, especially where high grade Roses are grown. Drip, in midwinter, on such Roses as La France or American Beauty, will often destroy flowers worth fifty cents to one dollar each. By locating the purlines over the walks almost every atom of drip in the house that would do damage can be obviated, and in our new houses none of the purlines are over the benches. Some will say there should be no drip in a properly constructed house, but we find the drip that causes the damage is that produced from condensation in midwinter weather, and not that which comes in from out-of-doors, and which never occurs when a roof is in proper condition.

A point worth considering is the destruction of green-fly. We have been skeptical as to the advisability of evaporating tobacco-juice, fearing that the moisture generated would tend to bleach American Beauty Roses, of which we are very large growers, and for that reason we experimented some time before using it on a large scale. Our experiments were satisfactory, and we furnished our whole place with pans or galvanized iron troughs, about three feet in length and four inches in width and depth, fitted to the steam-pipes, the steam-pipes running through the troughs. By setting the steam-pipes close to the bottom of the troughs the liquid is evaporated in about two hours, or much more quickly than if the troughs were placed on the pipes. This device should be used more as a preventive than a cure, for if the house is badly infested with green-flies it will take some time to remove them, but when the tobacco-extract is evaporated regularly and constantly no green-fly will ever appear. We have saved hundreds of dollars by the use of this simple remedy, and have demonstrated its desirability beyond all question.

We consider it a great advantage to take the chill from water before it is used on plants in midwinter. In watering we use a steam-pump. The distribution pipe, after it leaves the pump, is thrown into an ordinary galvanized hot-water boiler, such as is used in kitchens, entering at the bottom, the outlet being at the top. Through the centre of this heater or boiler a coil of one and a quarter inch pipe has been introduced containing about fifty or sixty feet. The exhaust steam from the pump is thrown into this coil, and, in passing through it, completely condenses, heating the water to a temperature of about fifty-five or sixty degrees in the coldest weather, which is about the normal temperature of the house. The advantage of this scheme lies in the fact that exhaust steam is absolute waste, and the lost heat is thus utilized. It is a very practical adaptation, from the fact that there is no exhaust steam unless the pump is working, and then the water is cir-

culating, so that the two conditions are inseparable. The danger in putting steam-heating pipes through the heater is that when the water had stopped passing through the heater it would soon become too hot to use. It would not be as economical as our plan, where nothing but waste steam is used.

The question, What twelve plants are the best companions of *Ficus elastica* and *Latania* (*Livistona*) *Borbonica* for house decoration? was submitted to Mr. Robert Craig, of Philadelphia; Mr. Charles D. Ball, of Holmesburg, Pennsylvania; Mr. W. K. Harris, of Philadelphia; Mr. F. G. Foster, of Hamilton, Ontario; and Mr. William R. Smith, of the Botanical Gardens at Washington, D. C.

In the lists presented by these gentlemen, from which rare and expensive plants were omitted, *Areca lutescens*, *Kentia Belmoreana*, *Dracæna fragrans*, *Pandanus Veitchii* and *P. utilis* were named five times; *Aspidistra lurida* and its variegated form and *Cocos Weddelliana* four times; *Phœnix rupicola* and *Ficus elastica variegata*, three times; *Araucaria excelsa*, *Dracæna terminalis*, *Aralia Sieboldii variegata*, *Kentia Forsteriana*, *Phœnix reclinata*, *Raphis flabelliformis* twice; *Seaforthia elegans*, *Cyperus alternifolius* and its variegated form, *Caryota urens*, *Cycas revoluta*, *Phormium tenax variegatum*, *Cordyline terminalis* and *Dracæna Goldieana*, once each.

Notes.

A. Lietze, a florist of Rio de Janeiro, Brazil, has written to a Chicago correspondent asking him to take charge of an exhibit for the World's Fair of 400 varieties of Caladium.

The raisin-crop in Fresno County, California, is the largest on record. Fully 4,000 Chinese are now engaged in the vineyards of that county picking grapes, and they have advanced the price fifty cents a day over prices last year.

A western paper recently stated that a citizen of the town where it is published had "invented" a vine, to which he had given the name of Potomato, because it bears potatoes under ground and tomatoes above ground. This is not a new "invention," but probably a result achieved by grafting a Tomato-cion on a Potato-stock.

Many of the visitors at Toronto last week remarked the thrifty condition of the street-trees. The American Mountain Ash trees were conspicuously good, and were loaded with fruit. The practice of cutting back the Lombardy Poplars seems to give freshness and vigor to these trees, and they appear to be longer-lived than they are in the cities of the United States.

Mr. Frederick McMonnies, a young sculptor who has recently been studying in Paris, has completed a statue of Nathan Hale, the famous Revolutionary spy, which will be set up in the City Hall Park in this city. He has also received a commission to design the statue of Victory, which will be the crowning ornament of the soldiers' monument to be built on the government grounds at West Point by Messrs. McKim, Mead & White, and he will be the sculptor of the large Columbus fountain for the Exposition grounds at Chicago.

The death is announced, in his seventy-fifth year, of Dr. Henry Bennet, an English physician long established on the Riviera, where his garden at Mentone had become, under his zealous and intelligent care, one of the richest and most interesting in Europe. He is remembered as the author of a delightful book entitled "Winter and Spring on the Shores of the Mediterranean," by means of which he brought the Riviera, and especially Mentone, into wide repute as a winter residence for invalids. He found Mentone, a contemporary remarks, "an obscure hamlet; he left it the resort of thousands of invalids from all countries, with all the luxuries and appliances suited to their condition."

The most striking feature in the attractive public garden at Dijon, known as *L'Arquebuse*, is the so-called *Gros Arbre*, an immense Black Poplar, for which an antiquity of more than four centuries is claimed. Its trunk is said to be fifty feet in circumference, and despite the fact that it has lost its larger branches, it is still well clothed with leaves and is a stately as well as an interesting object. One can hardly realize that it is a tree of the same species as the myriads of slight feathery Poplars which grow in almost every field in these parts of France.

General Vincenzo Ricasoli, a distinguished Italian soldier who fought as a volunteer in Lombardy in 1848 and 1849, and later was the companion of Lamarmora in Sardinia and in the Crimea, and who in his old age came to be called the father of horticulture in Italy, has recently died. His garden at Casa Bianca, near Port Ercole, was one of the richest in the peninsula, and famous for the experiments its owner made there with Eucalyptus, Acacia, Palms, Cycads and other semi-tropical plants of which he was one of the first and most successful cultivators in Italy. He was particularly interested in the *Bulletin of the Royal Horticultural Society of Tuscany*, which he helped to found, and to which he made frequent and important contributions, describing in its pages the results of his experiments and explaining his broad and catholic views on all matters relating to agriculture and horticulture.

Professor Goodale, in his address as the retiring President of the American Association for the Advancement of Science, in speaking of the possibilities of Economic Botany, said that the methods of improving plants are already known so well that "if all our present cereals were swept out of existence our experiment stations could probably replace them by other grasses within half a century. New vegetables may be reasonably expected from Japan, which has already sent us many choice plants in all departments, and it is likely that some of our present vegetables, which are now much neglected, will come into greater favor and be improved. The fruits of the future will tend more and more toward becoming seedless, just as pine-apples, bananas and some oranges are now. There is no good reason why we should not have seedless raspberries, strawberries and blackberries, and also raise, by cuttings, plums, cherries and peaches free from stones."

A writer in Downing's *Horticulturist*, in the year 1846, stated that the Baldwin Apple "originated in Wilmington, near Boston, in that part which now makes a portion of the new town of Sommerville, in the county of Middlesex. The original tree grew on the farm of a Mr. Butters and was known for a time as the Butters Apple. This tree was frequented by woodpeckers, and Mr. Butters called it the Woodpecker Apple, which was soon abbreviated to the Pecker Apple. My trees, which I set out twenty-eight years ago, are registered 'Peckers.' This fruit must have been known about a century. Orchards were propagated from Mr. Butters' tree pretty freely, about seventy-five years since, by Dr. Jabez Brown, of Wilmington, and Colonel Baldwin, of Woburn, and their sons, to whom the public are principally indebted for bringing the fruit so generally into notice. From Colonel Baldwin and his family it took the name of 'Baldwin,' by which the fruit is now everywhere known."

Last week Professor J. L. Edwards delivered a lecture at Chautauqua on the Arboretum at that place. Among other interesting statements he said that there are found there fifty-six different species of native trees, or half the number of species in the state. The tallest is a Hickory, 132 feet high. The largest is a Red Oak, twenty-three feet in girth and 110 feet high. Twenty trees average seventeen feet in girth. The largest stump is that of a Chestnut, over which was built the original Chautauqua platform; it measures twenty-seven feet around. The speaker said that all people, and especially young people, should become interested in trees for the following reasons: Such a study cultivates habits of observation; the knowledge gained is intrinsically valuable; trees have interesting historic and patriotic associations; communion with nature is wholesome, cheering and ennobling; literature is permeated with the spirit and imagery of the forest. The very terms employed in literary work are redolent of the woods. Paper from Papyrus, book from Beech, library from liber, the inside bark, and leaf from leaves of the trees.

The famous Grape-vine at Hampton Court, near London, was formally referred to as the largest whose size has been recorded. But in the volume of Downing's *Horticulturist* for 1846–1847 we find a letter, signed "J. J. S., Philadelphia," which runs: "I have lately made an excursion to Burlington, New Jersey, for the purpose of obtaining the exact measurement of the most extraordinary Grape-vine I have ever heard of. It stands on a farm called West Hill, belonging to my late brother, two miles from the city of Burlington. . . . At three feet from the ground it measures six feet one inch round the trunk, and at ten feet high it is positively three feet in circumference. It is a native male Grape, and has been the wonder of the neighborhood as long back as the memory of man reaches. It is still healthy, and its giant folds run over and cover four trees, one of which is a full-sized White Oak, while the others are quite large. . . . This vine grows near a springy soil on upland, its roots, no doubt, penetrating to the water." To this Downing adds: "The celebrated vine at Hampton Court . . . does not, as regards size, deserve to be mentioned in the same paragraph."

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The Responsibilities of Florists.

We have heretofore alluded to the controlling influence exerted by florists and nurserymen in forming public taste in matters relating to horticulture. Many Americans, it is true, who own country places have a considerable knowledge of trees, shrubs and herbaceous plants, and give personal attention and study to the adornment of their home-grounds. Such places are not always planted in the most artistic manner, but the planting invariably shows individuality and more or less skill. Certainly their owners derive from them a satisfaction which can never be gained by those who have no knowledge of plants, and who therefore can give no intelligent attention to the work of their gardeners. There are many persons, too, who have clear and correct ideas about the plants and flowers which should be used for decorative purposes in-doors; and to them a vase of cut flowers, properly arranged and placed, will afford a much keener delight than it can possibly do to those who buy flowers simply because it is the fashion. And yet it must be confessed that a great majority of those who plant trees and buy flowers get all their ideas at second hand, and it is the nurseryman or florist who practically chooses for them where any choice is made. Generally it may be said that this duty devolves upon the local florist; for a florist can now be found in every well-settled neighborhood, and the bright display of his stock in the principal street advertises his business to every passer-by, while the grower of ornamental trees and shrubs is usually located in the country. In this way it happens that the florists of the country do by far the greater part of what is done toward forming and directing the taste of the people in horticultural affairs.

The thought naturally suggested by considerations of this kind is, that a grave responsibility must accompany such a power; or, in other words, that florists who exert such an influence upon public taste are bound by a corresponding duty to take heed that the public taste is elevated to an appreciation of the beautiful in its simplicity and genuineness, and not degraded by being familiarized with what is tawdry or false. On the other hand, it must be said that florists do business primarily for profit; and if buyers demand monstrosities in the way of floral designs, or ask for plants which have gained a fictitious reputation from highly colored pictures, but have no genuine merit, why should not this demand be met, especially when it is to the dealer's pecuniary interest to offer such supplies? Other tradesmen who furnish us with articles of clothing or jewelry or house furniture provide what fashion demands, without regard to the intrinsic beauty or ugliness of their wares, and why should a separate rule be laid down for florists? Really the obligation in one case is quite as binding as in the other. One of the essayists at the recent convention in Toronto characterized horticulture as a profession rather than a trade, and he probably meant by this that the cultivation of beautiful natural objects was a more dignified and responsible calling than other material occupations. But, after all, every man is under equal obligations to society to do all that in him lies for the general education in taste and morals. The conflict between personal advantage and the general good is not confined to any business or trade or profession. One calling, so long as it is a legitimate and useful one, is quite as honorable, intrinsically, as another. It is the conscience and intelligence with which work is done that gives dignity to the worker, whether he be artist or artisan.

Fortunately, as a matter of fact, there is little real conflict between the business interests of the florists and the claims of good taste. American buyers are quick to recognize the superiority of what is genuine over what is meretricious, so that American florists need have little fear of doing work that is too refined and artistic to win public appreciation. In our large cities the florists' windows which are most artistically decorated attract the most attention, and those florists who have made the greatest progress in the direction of naturalness and simplicity are doing the most prosperous business. That the florists themselves have made a conspicuous advance in the quality of their work is well known, and President Norton stated this fact with emphasis in his address at Toronto a fortnight ago. Of course, there are some growers who estimate the worth of a rose according to its bigness only, and there are others who value flowers for their novelty or singularity rather than for their beauty or sweetness. Many stiff "set pieces" are yet constructed, and reliance is still placed by some floral designers on stuffed birds and artificial insects. There are many things yet to be learned of color-harmonies and contrasts, and of the proper use of foliage. Much of the bedding out in public parks and private grounds offends cultivated taste by its violent color, and equally offends good morals by its needless extravagance. But, after all, there is no country in the world where the florists show such good taste as those of the United States, and nowhere in the world where floral work of genuine merit receives such ready and such hearty recognition. Indeed, it is the quick appreciation of American buyers which has reacted to school the florists and train them to work of higher excellence.

The sum of the matter is, that every conscientious florist must feel that within his sphere, and to the extent of his personal ability, he has some responsibility for the influence of his craft upon the horticultural taste of the community. He can do much to develop correct taste; he can do something to retard this development. A devotion to the duty which devolves upon him as a public-spirited member of society does not, however, demand any business sacrifice. Enlightened self-interest, as well as loyalty to his calling and to art, should prompt him to avoid everything insincere and affected with all tricks and deceptions for gaining temporary applause, until all his work is characterized by truthfulness, simplicity and naturalness. Of course, no one but a genuine artist can do work of such quality, and the

acquisition of such skill as invests its possessor with the rank of an artist means patient study and long training, added to original good taste. No business men, as a class, are more alert than American florists to catch new ideas, to adopt new devices in cultivation, in buildings, or in mechanical appliances for saving labor. If to this spirit of enterprise is added a thorough training and a conscientious devotion to the highest ideals on the æsthetic side of horticulture, the country will have reason to be grateful for the influence exerted by its florists.

Monuments in Public Places.—II.

OUR public monuments might, as a rule, be much more successful but for a common mistake in their first conception. Nine times out of ten a statue is insisted upon, when a bust or an architectural monument, with a fitting inscription and, perhaps, a profile-portrait, would be all-sufficient, and, indeed, distinctly more appropriate. This perpetual demand for full-length figures works in two ways against the sculptor's success. In the first place, the average of physical dignity and beauty in our race is not very high; many men since Saint Paul have been weak in their bodily presence, though giants in moral and intellectual respects; and since the time of Saint Paul there has been a great change for the worse in masculine costume, judged from the artistic standpoint. The modern portrait-sculptor has fallen upon hard times; why make his trouble greater by insisting that he shall portray the whole body in cases where not the body but the mind of the subject is the thing we really want to commemorate?

In the second place, it is as difficult in cases such as this to evolve an appropriate conception as to execute it beautifully when arrived at. Unless a man's physical presence has been prominently associated with his services to the public, how shall it be posed and presented so as to express any clear and dignified idea? The broad rule seems to be that a man of action should be portrayed at full length, standing or mounted, as the case may be, and that for men who have labored rather with the brain alone than with brain and body both, a seated figure is at times desirable, while most often a portrait of the head alone will be best. No one would be satisfied with a figure of Sherman except on horseback; a bust of Farragut could never have expressed him as Saint Gaudens has done, placing him in a bold attitude on his quarter-deck; nor could a great orator, whether statesman like Webster or clergyman like Beecher, be fully characterized except upon his feet. But we can fancy a chief-justice, for example, best portrayed in a sitting posture; and it might seem as though this were the most natural aspect to choose for Lincoln, did not the Chicago statue prove that a great artist may see deeper than ordinary mortals, and, working more boldly than they might counsel, may treat his theme more clearly and fully. In this monument the chair of state behind the figure explains one phase of Lincoln's responsibilities and services, while the erect, yet reflective, pose of the figure itself declares that the man who filled the chair was likewise an orator, and was not only the people's executive, but their actual leader in a crisis demanding the most energetic action.

Thus we see that two things should be considered in the conception of a memorial. We should reflect upon the character of the services rendered by him who is to be its subject and also upon the bodily presence Providence had bestowed upon him, and then decide whether a statue, a bust or some still less personal kind of monument should be erected. William E. Dodge, for instance, was a good and useful citizen, but a statue in his honor was less appropriate than would have been a drinking-fountain suitably inscribed. A bust of Holmes or Whittier would be better than a statue; but Carlyle's more strongly marked personality, more energetic cast of mind, needed to be shown, as they are in the seated statue near his old home in Chelsea, through a rendering of his tall gaunt form and familiar voluminous cloak. An intelligent artist will not find great difficulty in deciding this question of appropriateness in the character of a monument; but, unfortunately, the artist is often the person who has the least to say in the matter.

Even in the interests of mere variety we might well wish for a wider difference in the conception of our monuments. But to bring it about in satisfactory ways we must realize that we should depend less exclusively than hitherto upon the sculptor. We should sometimes leave the work entirely in the architect's hands, and should always associate architect and sculptor together. All who have seen the Chicago Lincoln know how vastly the effect of the admirable figure is increased by the striking, yet quiet and dignified, character of the substructure on which it stands; and a large part of the impressiveness of the Farragut figure in Madison Square depends upon its base, although this, from the purely architectural point of view, is not wholly satisfactory. It seems to us that, in always insisting upon the assistance of an architect, St. Gaudens has rendered a service to the cause of monumental art scarcely inferior to that performed by his own creations. His example is being more widely followed year by year, but poor or inappropriate bases are still the rule, and occasionally we see an instance of their total abolition, in curious disregard of that fundamental rule of criticism and common sense which says that a work of art must always be confessed and emphasized as such. In the Central Park, for instance, Mr. Kemys' fine figure of an American panther crouching for its spring is set, without any pedestal, on the top of a vine-covered rock overhanging the drive-way. We believe that this was done against the sculptor's protest, and certainly no true artist would consent to so puerile and mistaken an effort to pretend that a bronze figure is an actual animal. A worse example of this kind of folly came to our notice recently in the photograph of a statue to some military commander which has been erected at Gettysburg. The figure is standing, field-glass in hand, and is placed on the edge of an abrupt low rocky hill without any base, except the necessary thin plate of bronze beneath the feet. To persons looking from below it may well appear like the figure of a living man. But is this a worthy aim in the placing of a work of art? Could even the best statue in the world fail to seem cheap and trivial thus deprived of proper station and emphasis? We are still in the very infancy of art when we can tolerate blunders so gross and self-apparent.

Only a Fence-corner.

THE difficulty of mowing in an angle saves some charming bits for the artist, and the eye of the country stroller is often caught by some such graceful grouping as is shown in the photograph of a fence-corner in Illinois, taken by Mr. D. Burnett, of Olney, in that state, and reproduced in this number (page 415).

In the foreground are to be seen the rosy blossoms of *Hibiscus lasiocarpus*, which grows abundantly in moist portions of the prairies in parts of Illinois and southward. It has soft, downy leaves, and blossoms resembling those of the Rose Mallow, which grows on the borders of the salt-marshes of New England. Behind the Hibiscus a tall wild Sunflower is leaning up against the fence, while a tangle of Ferns and Golden-rods veils the lower stalks of the flowers. In the foreground are some distinct leaf-forms such as the old masters loved to delineate in their carefully studied pictures, and the outline of the group of plants is free and graceful.

So prodigal is Nature of her wealth that she clothes the edges of even the dusty highway with beauty, and, given the unmolested corner of a field, this greatest of artists will weave an embroidery of varied color and exquisite design that baffles the hand of man to imitate. Sometimes her tapestry is woven of the delicate fronds of Ferns, and again she dapples her greens with the sky-blue flowers of the Succory, or, perhaps, a clump of Fire-lilies glows amid the long grass, or a Morning-glory festoons the rails,

and opens its dewy cups to catch the first kiss of the sunlight.

In other corners the wild Rose clusters, thorny and sweet, and, if the ground be damp and sedgy, one may find Cardinal-flowers, and the sculptured white petals of the Arrowhead, mingling with the blue of Pickerel Weed, and the pink blooms of the Milkwort.

In drier places little seedling trees are apt to spring up, kept warm and shaded by embracing Jewel-weeds, till their roots gain vigor enough to force the strong young shoots up into the sunlight, or, perhaps, a Clethra may have strayed away, with a sweet Fern for a companion, from neighboring woods, filling the air with a forest-fragrance.

No matter how rough and ugly a field may be, its fence-corners, if neglected, become its redeeming feature, so that one is grateful to the careless farmer whose sense of duty does not drive him to clear up what he considers rubbish, but allows the wild things to gladden us in their own way, with their dainty forms and graceful attitudes, as they hide the coarse rails with their soft leaflets, or wreathe the rough surfaces with garlands of flowers and festoons of foliage. Such little pictures as this are to be seen on every hand by all who will look for them by the way-side. Free, indeed, is the gift of beauty to man, when from neglect he can reap loveliness, and from disorder, grace.

Winter Beauty in the Home Grounds.

A LETTER in *Downing's Horticulturist* for 1851 shows that, forty years ago, there were some persons who appreciated the charm of a garden outlook especially prepared to be beautiful in winter. "I saw, not long since," this letter runs, "a country house where there was a novel feature that delighted me. This was a winter landscape or scene on one side of the house upon which the two rooms occupied by the family in winter looked. A broad glade of lawn was agreeably varied and quite surrounded by beautiful evergreen trees and shrubs. From the windows commanding this scene not a leafless tree was in sight, nor any other feature which reminded you that the leaves had fallen. The grass still green, and the White Pines, Spruces, Firs, Hemlocks, Junipers and Laurels, from large trees to small shrubs, were all arrayed in the richest green—so as fairly to belie the season. Even when the lawn is covered with snow the evergreens are still cheerful, and their verdure is heightened by the contrast. I have seldom seen a happier idea, or one better carried out. It seems to me particularly well suited to country houses in which the family passes the whole year." To this Downing himself added: "An excellent arrangement, and one which may be heightened in the execution. With the American Holly and the Winter-berry to decorate it by their brilliant berries, and such plants as the Yucca and Chinese Honeysuckle, which hold their foliage all winter, to give it variety, a winter garden might be a gay and agreeable thing to look upon when January is at its bleakest."

Perhaps country homes may now be found here and there where careful provision has been made for the pleasure of the eye in winter as well as summer. But certainly they are not common. Coniferous evergreens are not so generally planted now as they were some forty years ago, when the rage for them in England, like other horticultural fashions before and since, extended to this country also. The results of this fashion are, of course, still everywhere conspicuous, and we often see plantations around houses where the family resides only in summer almost entirely composed of dark and heavy conifers. Conversely, now that deciduous trees are more generally liked, we frequently see houses that are inhabited all the year round encircled by grounds which, as winter approaches, show only bare trunks and leafless masses of shrubbery.

No rule, even of the broadest sort, can be laid down to determine where evergreens should be planted, in what numbers, or in what combinations. The very essence and interest of gardening lie in the fact that each problem is a new one which must be solved in accordance with the habits and tastes of the family in question, as well as with regard to the size, situation and character of the grounds. But we can at least assert that there is no reason why the owner of a house occupied in summer only should prepare for beautiful winter effects. His aim should be to attain a special, temporary effect, and he can secure this more completely than his neighbor who is obliged to provide for the whole circle of the seasons. But if it would be foolish for him to think of winter beauty, it is still more foolish for those who must look at their grounds in winter also, to think only of the summer, or, as we sometimes find to be the case, almost exclusively of the spring. The letter we have quoted hints at the right scheme—a comparatively small reserved portion of the grounds, commanded by rooms appropriated to winter use, and specially planted with this season in view.

Even here, however, too vigorous an effort ought not to be made to "belie the season." In our climate this cannot be done so successfully as, for example, in the southern parts of England, where the grass remains green all winter, and many broad-leaved evergreens flourish which would die with us. In such a climate as that of our northern states winter will strongly assert itself, no matter what we do to combat its supremacy. And therefore our aim should be not to disguise its presence, not to pretend we are still in the autumn or already in the spring, but to show how beautiful winter itself may be in its own proper character. For this reason we could hardly commend an arrangement where "not a leafless tree was in sight." A true lover of nature takes especial delight in the beauty that most trees display when stripped of their leaves. In winter we see the structure of a tree in its sturdy trunk, diverging branches and feathery spray, and this structure varies perpetually as we pass from species to species. Moreover, the effect of a plantation of evergreens, whether laden with snow or not, is too heavy and monotonous unless lightened by some intermixture of leafless branches. Therefore, instead of altogether banishing deciduous trees, at least a few such should be selected for the winter plantation with special reference to their comparative beauty when leafless. A sturdy rugged Oak, for instance, with its wide-stretching branches; a Dogwood, with its horizontal layers of branchlets; a group of tall, narrow, fragile, light-sprayed Gray Birches, and an American Beech, isolated perhaps so that the symmetrical beauty of its shape may fully appear, will greatly increase the beauty of a winter plantation. And the gain will be in effects of color as well as in effects of form. The Oak will keep a large part of its yellow or reddish leaves throughout the winter, and the Dogwood some of its scarlet berries; the trunks of the Birches will shine like silver against the dark green background, and the pale gray color of the Beech will be as attractive as the extraordinary grace of its ramification. Finally, these trees will vastly increase the beauty of the scene when summer comes; and we should not forget that even the winter plantation ought to be beautiful in summer too.

The Oak, the Birch, the Dogwood and the Beech are only four among many deciduous trees which may be selected for conspicuous beauty in winter, while the list of deciduous shrubs of similar value is very long. A shrubbery composed entirely of evergreens, even though many broad-leaved forms are mingled with the coniferous species, can never be so beautiful as one which is enlivened by such plants as the Scarlet-twigged Dogwoods, the Golden-barked Willows, the Kerria, with its shining green branchlets, by the Carolina Rose, the High-bush Cranberry, the Cockspur Thorn, the Black Alder, and the Snowberries, each carrying well into the winter its load of fruit, now black, now white and now a vivid red, and by the Bittersweets, with their contingent of still more brilliant orange and scarlet berries. Then, too, one might recommend the planting in a winter landscape of a few very early-flowering shrubs like the Forsythias and the Shad-bush, which, though they will not add distinctly to the actual winter effect, will prove spring's arrival at the earliest moment.

As regards the choice of the evergreens to be used in winter plantations we merely note that, since Downing's day, the list of available exotics for this purpose has vastly increased, while more attention is paid to those native plants for whose use he so persistently and earnestly pleaded. We will, however, recommend one single plant of the latter kind, common along our eastern shores but not nearly so well known as many costly exotics of far inferior beauty. This is the Inkberry (*Ilex glabra*), which, in its native woods, grows tall and rather straggling, but, under cultivation, assumes a compacter form while losing none of its grace. Its beautifully shaped, long, narrow leaves, delicately toothed at the apex, recall the Laurel-leaves one sees so constantly in Grecian decoration; they remain bright green and glossy throughout the winter, while an added attraction is offered by the clusters of small black berries. This is one of the most beautiful of North American shrubs, even when compared with others which carry their leaves throughout the winter; and in winter the lightness of its spray and small size of its leaves contrast favorably with the broad-leaved evergreens more generally planted.

New or Little-known Plants.

Protea nana.*

ALTHOUGH this plant was cultivated at Kew in 1787, whither it had been sent from the Cape by the collector Masson, it had disappeared from cultivation, and had been forgotten long ere it was reintroduced to Kew, where it flowered in a cool greenhouse two years ago. Fifty years ago there were about thirty species of Protea included among popular greenhouse plants in England; now one may safely say there is not one, the few really under cultivation being only in botanical collections. Writing of these plants exactly ten years ago, Sir Joseph Hooker observes: "The Cape *Proteaceæ*, the favorites of our grandfathers, may be said to have gone out of cultivation, so completely have they been replaced by other tribes of more or less deservedly popular, but neither more interesting nor more curious, plants. . . . This neglect of a whole genus of most conspicuous plants, which forms a grand feature of one of England's greatest colonies, is not due to want of beauty, for some of them are among the handsomest of plants, whether for size, form, or color of inflorescence; and would carry away the first prize at any horticultural show. . . . Of these, however, the present, and even past, generation of horticulturists know absolutely nothing. Nevertheless, that these and many other plants requiring like treatment will be reintroduced, and will be the wonders of the shows for many successive seasons, is as certain as that they were once the glories of the old flue-heated houses that our forefathers called stoves, in which Orchids quickly perished, and Banksias and Proteas throve magnificently."

Although this prediction has not yet been realized, at least two species of Protea have recently been exhibited in London and won considerable attention, namely, *P. cynarioides*, which some thought was a glorified Artichoke, and *P. nana*, the species represented in the illustration on page 413. The plant is scarcely two feet in height, the branches are hard and wiry when mature, the leaves are rather rigid and pine-like, and the nodding terminal flower-heads are in the form of shallow cups, two inches in diameter, and composed of several rows of rigid petaloid bracts, the lower ones colored green, the upper deep crimson. The true flowers are packed closely together in the form of a disk, which occupies the greater part of the cup inside and is colored yellow, the exserted stigmas being pink. The flower-heads remain about a month in perfection.

The Kew plant is nine years old, having been raised from seeds received from Professor MacOwen, of Cape Town, in 1882. It has been grown in an airy, sunny greenhouse, and is planted in very sandy peat. The one great danger to cultivated Proteads is excessive watering, and to guard against this it is found to be a good plan, in the case of delicate species, to place the pot in which the plant is growing inside a larger one, filling up the space between with silver sand. The latter is always kept moist. By this means we have been able to keep and grow such Proteads as the Cape Silver Tree (*Leucadendron argenteum*), *Protea nana* and other delicate species. Beside the two already named, the following Proteas are now in cultivation at Kew, *P. longifolia*, *P. marginata*, *P. grandiflora*, *P. mellifera* and several undetermined species. These plants are easily raised from seeds, which may be obtained in quantity from the Cape. I have seen huge bushes of *P. speciosa* growing among the rocks near Grahamstown, and as thickly clothed with large heads of rosy red, deliciously fragrant, cup-like flowers, as a big specimen Rhododendron is with flowers when it is at its best. *P. cynarioides* is very abundant in some parts of the eastern division of the Cape. It grows to a height of from three to five feet, and, when in flower, its enormous rosy red cups, not unlike the heads of Artichokes in size and shape, are such an attraction that the colonists are wont to devote a special holiday to a picnic among the "honey-pots," as the flowers of this Protea and others are called. Proteas certainly are deserving of the attention of every cultivator interested in plants remarkable not only for beauty of flower but also for singularity of form and color.

There are about sixty species of Protea known, and, with the exception of one or two found in Abyssinia, they are all natives of south Africa.

Kew. *W. Watson.*

* *Bot. Mag.*, t. 7095; *Smith Exot. Bot.*, I., t. 44 (*P. rosacea*).

Foreign Correspondence.

London Letter.

LONDON is now supposed to be taking its holiday, and the exodus of the rich patrons of horticulture to their country-seats has a marked effect upon the attendance at the metropolitan gatherings. But the actual workers in horticulture know no rest, for the seasons of the various classes of popular plants and fruits succeed and overlap each other without interval. At the last fortnightly meeting of the Royal Horticultural Society at Westminster, now the centre of horticultural activity, no one would have supposed that it was holiday-time to see such an assemblage from all parts of our little country, for one could hold converse with a hundred of the best and most representative men in every branch of gardening, both scientific and practical.

The popular flower of the season is still the Carnation, which seems to take a firmer hold of the public taste year after year. This season its flowering time has been much lengthened owing to the dull and rainy weather of the past month. The favorite flower of the Rothschilds is now the flower of everybody, and since raisers have turned their efforts upon the extension of the sturdy border sorts, with well-defined self-colors, both delicate and brilliant, there is not a good garden in the country where the Carnation does not receive special attention, just as the Rose, Chrysanthemum and Dahlia do. While the strictly florists' type has not been improved upon from what it was thirty years ago, we have now such a multitude of self-colors of sturdy constitution that it is quite a business to select even the best twenty sorts. Among new sorts shown by Turner, of Slough, some of which captivated the specialists, my choice would be one named Queen of Bedders, which not only has large full flowers of a soft crimson, but has such vigorous grass and is so dwarf that it is exceptionally valuable for the open border. This variety, of which a dozen large bunches were exhibited, took, in its class, the first prize by an amateur for "flowers cut from plants which have been wintered in the open garden and staged without 'dressing,' and exactly as they were cut from the plants." This class is quite an innovation and in the right direction, the object being to develop excellence as decorative flowers in the open border and to encourage varieties that yield abundant heads of flowers. The schedule, moreover, stipulates that the flowers are to be shown in bunches, with their own foliage and buds. No bands or ties round the calyx are allowable, and no wire-supports or paper-collars are allowed, and a split calyx is a disqualification of the bloom. This is a long list of restrictions, but the Queen of Bedders fulfills all the conditions, and, no doubt, it is the forerunner of a race that will satisfy the most exacting. A few years ago such a high standard would have been thought wholly unattainable, but now we are developing a dwarf race which needs no special attention to make their flowers respectable.

The flower-loving people welcome this change from artificiality to naturalness, not only in Carnations but in other flowers, for we are gradually throwing aside the conventionalism of the old school at the metropolitan shows. I have mentioned only one sort of Carnation of the multitude that were shown, and I doubt if your readers would care to have a full list, but a dozen of the very best

would include the following, and most of these were distinguished by awards of merit from the judges. Of the finest yellow ground sorts were: Countess of Jersey, edged with bright rose; Edith Wynne, heavily marked with deep maroon; Victory, edged and flaked bright red; Mrs. Harwood, scarlet-edged. Among self-colored flowers were: Ruby, clear carmine-crimson; Ketton Rose, bright rose-pink; King of Scarlets, vivid scarlet; Pride of Sevenoaks, pure white; Golden Fleece, bright yellow; Mrs. Walford, yellow striped rose; Hotspur, clear, soft rose; and Mrs. Apsley Smith, very bright scarlet. These are the best of the new sorts which combine all the good qualities which the specialists discover before they certificate them, and it may be assumed that they are improvements upon older sorts of a similar color.

Besides the Carnations, there were exhibits of interest to the specialist in Orchids, Roses, and hardy plants. The most remarkable Orchids were three new hybrid Cypripediums shown by Messrs. Veitch, of Chelsea. *C. Corningianum*, named in compliment to one of your great collectors, is a cross between *C. superbiens* (*C. Veitchii*) and *C. Philippinense* (*C. lævigatum*). It is intermediate in

Fig. 66.—Protea nana.—See page 412.

character between the parents, the flower being of the same size as *C. superbiens*, with a similar pouch, but the lateral sepals are much deflexed, as in *C. Philippinense*, but shorter and broader, and are copiously dotted with minute black spots on a purplish ground. This is the nearest approach to the rare *C. Morganæ* that I have seen. Cleola is a cross between *C. reticulatum* and the little *C. Schlimii album* as the seed-bearing parent. The progeny recalls the beautiful *C. caudatum* of the Sedeni group, but the flowers are smaller and whiter; indeed, there is only a suggestion of pink to mar the chaste purity of its ivory whiteness. The form of the flower is exquisite. It is of vigorous growth, inheriting that character from *C. Schlimii album*. *C. macrochilum* is a remarkable hybrid, as it is the first instance of the strange *Uropedium Lindeni* being crossed with a true Cypripedium, the parent being *C. longifolium*, which gave us the Sedeni hybrids. At first sight one would think the hybrid a large-tipped form of *C. caudatum*, so alike are the flowers in general appearance. The lateral sepals are pale purple, long, and hang like strings; the back sepals are green striped, as in Uropedium, but the lip is different, being large and long, of similar color to that of *C. caudatum*, and the inturned edges at the top have the same ivory appearance. This hybrid tends to prove what some specialists have always maintained, that Uropedium is but a deformed variety of Cypripedium, possibly of *C. caudatum*. It is singular that, from the result of intercrossing, it should have so completely recovered its lost pouch. Other Orchids of interest shown were *Odontoglossum Hennisii*, a new species which Mr. Rolfe describes as having affinity with *O. odoratum*, but cultivators will compare it with *O. constrictum* and *O. Lindleyanum*, from its general appearance; but it is different, as may be seen by the much broader lip. The plant shown was a poor representative of what Mr. Shuttleworth considers a really pretty cool Orchid. The splendid new *Dendrobium Statterianum* is a gain and won much admiration. It may be described as having the growth and flowers of *D. crystallinum*, with the color of *D. crassinode Barberianum*, and the flowers are as thickly set on the slender stems as in that variety. As a late summer-blooming Dendrobium it has no rival. *Phajus Humbloti rubescens* possesses, as its name implies, a deeper color than the type, and is a first-rate Orchid. *Lælia elegans Turneri*, the best variety of the species, was shown finely, and so was *Angræcum Ellisi*, with spikes a foot long. Besides these was a grand group of *Disa grandiflora* from Chatsworth, where its cultivation is plainly well understood. Some of the spikes bore ten open flowers, which, as every orchid-grower knows, are produced only on strong plants.

Among the new Caladiums was a remarkable group shown by Mr. Bausé, well known in earlier days as a raiser of Coleuses and Dracænas. But most of his Caladiums had their origin in France, and the raisers there have apparently turned their attention to the production of those sorts only that have very rich-colored leaves, for most of the new ones have pink, carmine and crimson foliage. There were quite half a hundred shown, and a dozen of the best I picked out were Madame Leon Say, M. Leon Say, Comte de Germiny, Raymond Lemoinier, Ibis Rose, Madame Alfred Magne, Comtesse de Brouses, Marie Freeman, Oriflamme, Mrs. Harry Veitch, Louis Van Houtte and Le Nain Rouge (dwarf). All these are first-rate.

Among new Roses shown by Messrs. Paul, of Cheshunt, the finest were Charles Gater, a brilliant scarlet-crimson, good in form and luxuriant in foliage; T. B. Haywood, combining the qualities of the old Alfred Colomb and the brilliancy of the Duke of Edinburgh; Duke of Marlborough, in the way of Auguste Mie, but more powerfully scented, and Kaiser Friedrich, one of the Gloire de Dijon type, but with a more conical and better-shaped flower in the open state. None of these novelties, however, took the fancy of the committee shown in their present condition after such rain-storms as we have had.

A new race of the annual *Chrysanthemum carinatum* was shown by the Messrs. Hurst. The flowers are as double and as large as double Pyrethrums, and varying in color from bright golden yellow through deep bronze maroons to the richest crimsons. These beautiful varieties are destined to become popular as they are so easily grown, and no doubt they will be improved upon still further now that a distinct break has been made.

Dahlias have made their appearance at the show-table, and Messrs. Cannell showed some Cactus varieties of the true Yuarezi type, not the spurious kinds which sometimes pass for Cactus Dahlias. The best were Panthea, orange-scarlet; Oban, bronzy crimson, and Duke of Clarence, deep crimson. These, together with Cannell's double Begonias, which look more like double Hollyhocks in size and form than the Begonias of a few seasons back, made a brilliant display.

London. *W. Goldring.*

Cultural Department.

Midsummer Flowers.

China Asters.—The flowering of these plants marks the culmination of the summer garden. At this time the annuals have about reached their best state; the summer-flowering perennials are making their second growths, and the first of the multitude of fall-flowering composites are rapidly coming into bloom. Each season brings its novelties, and among the spring offerings of the seedsmen few are usually so well worth trial as the Asters. Easily grown, they produce a large crop of the most useful and lasting flowers, such flowers as are never in too great abundance in any garden. Not all the varieties are improvements on the old favorites, but each year there are found some kinds with valuable distinctions entitling them to a permanent place in the annual border. The Comet Asters of the last few seasons were a great acquisition, the Rose variety being especially charming. This season we have a new strain in the Jewel Asters, which prove to be finely formed flowers, well incurved, though I have grown no nine-inch specimens, which size they are said to attain. The Apple-blossom is of the faintest flush of pink, and very attractive. The Deep Rose, as its name implies, is dark pink and of the same form. The Snowball and other white Asters do not seem to be any distinct advance on old forms. One cannot have too many white and pink flowers in a garden where flowers are in demand. For some reason, I suspect not unconnected with the prevailing shades of dress goods, there has been a rather unusual draft on my pink flowers this season. I grow during the year a fair number of flowers, but until this experience I had not noted specially the comparative scarcity of good pink flowers of a satisfactory shade.

Hardy Sunflowers.—Among the single flowers of these I have seen none more satisfactory, in substance, form, and color, than *Helianthus rigidus*. They are about three inches in diameter, a rich golden yellow of pure tone, with a dark-brown centre. The plant has a stiff habit, with sparse foliage. It has an objectionable way of spreading through the borders by underground stolons, the old crowns dying off. Unless one is familiar with this habit he may think the plant is lost, or he may lose it by digging up the border around old crowns. *H. Japonicus* (or *præcox*) is a form of *H. rigidus* sent out by Ware, but it does not seem distinct enough for name, especially for a misleading one—Japan, I believe, not having any species of Helianthus. With me it is no earlier than *H. rigidus*. After, or with *H. rigidus*, I should say that *H. lætiflorus* is the most satisfactory. This has more abundant foliage, the same root-action, and the flowers are perhaps a trifle deeper in color, with yellow eyes. The petals are also more abundant, and the flowers are sometimes semi-double. I have a third variety, the name undetermined, which came from seeds supposed to be of *H. rigidus*. This has flowers of a lighter yellow, and is not a wanderer at the root. My double Sunflowers have mostly drifted into my neighbors' gardens, where I enjoy them. They are fine bits of color at a distance; near by they are a trifle lumpy, and the leaves gather all the floating mildew.

Clematis paniculata and Schubertia grandiflora.—These two plants, now in bloom on the same trellis, form a charming picture. The large glossy leaves and clusters of large waxen white flowers of the Schubertia enhance the grace of this most lovely Clematis. The figure of a flowering branch of this plant in Garden and Forest, although accurate, did but scant justice to its graceful, dainty, spray-like blooming habit, which can only be shown by the entire vine. In any stage, the plant is one of the most valuable climbers of recent

introduction. Against a south wall this was one of the earliest plants in my garden to start, making growth in late January.

Phytolacca decandra.—This is a truly regal plant, with smooth, erect crimson and purple stem, branching upward at the top, with ovate leaves and white flowers, followed by racemes of purple berries, and yet it is only the Pokeweed! Never until some bird dropped the seed at the side of my water garden, where it has grown into a large specimen, had I noticed the beauty of this common wayside weed; but there it stands, growing out of the Irises, quite holding its own, in stateliness and distinction, among the best exotics.

Elizabeth, N. J. *J. N. Gerard.*

Fig. 67.—Fence-corner in Illinois.—See page 410.

Experiences with the Rose-bug in 1891.

This insect (*Macrodactylus subspinosus*), of which much has been already said in Garden and Forest, appears here in annually increasing numbers, and seriously threatens our fruit-crops, and especially the grape. Over a wide area in southern New Jersey it has this year devoured the grapes, the blackberries and several other fruits. In the autumn of 1890 I undertook to trace its life-history. In October and November I dug in the soil of my farm and found the larvæ there at a depth of some three inches, and disposed to burrow more deeply. When a number of larvæ were placed on loose soil in a quart-can they soon went beneath the surface, and continued until they reached the bottom of the can. Instinct carries them below reach of frost, and possibly the alarming increase of these bugs for the past three years is due to a succession of mild winters; the ground never having been frozen more than two inches in depth. Almost weekly during the winter of 1890–1891 I renewed search for the larvæ and found them always a little deeper, until they had reached a depth of five or six inches.

The larva resembles a small white grub, is about a half-inch in length, and is coiled into a ring, with head and tail meeting. I do not find them in wet and heavy ground.

On Monday, May 25th, 1891, Professor John B. Smith, Entomologist of New Jersey Experiment Station, came here, and we dug for the rose-bugs and found, in the same square yard of soil, the larva, the pupa and the fully developed insect. This explains the constant increase of rose-bugs during their term. They do not all appear at once, but come out in succession.

On May 27th my diary notes: "Found the first rose-bug to-

day." To complete this part of its history I quote again from the diary, June 26th: "Rose-bugs nearly gone; can find only a few, which appear moribund." On June 28th: "Can find no more rose-bugs." This agrees with observations of former years. The rose-bugs continue here for about one month.

On June 4th Professor Smith came here again, provided with various chemicals which we hoped might be destructive or repellent of the insects, but we found nothing destructive to the bugs which was not ruinous to the plant. In Bulletin 82 of the New Jersey Experiment Station, Professor Smith tells more of the life-history of the rose-bug than has been known to entomologists. He confined a number of the insects in a glass fruit-jar, partly filled with loose sand. They burrowed down in this several inches, where they built a cell, laid their eggs and then returned to the surface.

Whether they again go down to deposit another batch of eggs is yet not known. It has hitherto been believed that the rose-bug oviposited near the surface of the ground, and that the larvæ burrowed, as do those of the potato-bug. Observations this year prove this belief to be wrong. The mature beetle burrows some inches below the surface, there lays her eggs, and then the larvæ, when hatched, continue to go deeper. Perhaps the insect does not begin to reappear until developed into the fully matured beetle. Then these come forth in constantly increasing numbers for about two weeks, when the rose-bug invasion may be considered at its height. From this time the older bugs seem to be nearing their limit of life, and doubtless the death-rate increases till the last bug dies. The life of an individual bug does not endure for a whole month. This is the length of time from the appearance of the first specimen to the disappearance of the last one. Professor Smith's bulletin enumerates a long list of chemical poisons which proved of no use against the enemy, and the experience here of Dr. Kellogg and myself with pyrethrum, sludgite, hot water, and many other remedies, if fully written out, would make an entertaining story. Up to this time, however, no practical way of combating these pests is known to me—that is, I am not yet sure of any way, but I will venture to suggest a plan which offers some promise of success.

When, as Special Agent for Department of Agriculture, I began experiments for the prevention of grape-diseases, I observed that where the "Bordeaux mixture was used the rose-bugs departed." I think Professor Riley mentioned this in one of his bulletins. Subsequent observations did not confirm this statement; but, per contra, these applications of the copper solutions were made a little too late to be protective against the insects. I was called away, and did not spray my vines until they were nearly out of blossom. During this time the rose-bugs did most of their damage.

This year I made the application of the copper mixtures as complete as might be. I bought two Eureka sprayers, and sprayed my vines every ten days from the time the buds opened until August 23d.

The north section of my vineyard was left unsprayed, because I had not time to go over it. The rose-bugs pervaded my vines, but only on the unsprayed section is the loss total. No grapes are left there, but on the sprayed vines there is a full crop, free from harm of rose-bugs or of rot.

But these trials must be made for successive years before we can be sure that we have a real preventive. The rose-bug is capricious. It may bring ruin to a vineyard this year, and leave the same unharmed the next year. Yet, I am strongly disposed to believe in the Bordeaux mixture, early applied, as a repellent to the rose-bug.

I find the Eureka sprayer the best machine to use. Other Knapsack sprayers are nearly as good. Any of them are better than the horse-power machines.

Vineland, N. J. *A. W. Pearson.*

Notes on American Plants.

THE Monardas, or Horse-mints, of which we have several species, are quite attractive plants when in flower, and their flowering season is usually a long one. They are erect in habit, usually more or less branched toward their summits, and quite odorous. *M. didyma*, commonly called Oswego Tea or Bee Balm, is by far the handsomest species, having large heads of cardinal-red flowers, which, in some forms, are quite as rich in color as the Cardinal Flower (*Lobelia cardinalis*). I doubt if this species is anywhere so abundant as *M. fistulosa* (Wild Bergamot), which, in some portions of Illinois and Missouri, is very common along the railroads and in fallow fields. Though this is not so attractive a plant as the Bee Balm, it is well worthy of cultivation, bearing an abundance of light purple flowers, which are durable and pretty. It had commenced to bloom in favored situations by the 3d of July, and now, more than a month later, it appears to be in its prime. Some plants are not yet in flower, and it seems as if its season of bloom would extend over a period of eight or nine weeks.

Sabbatia angularis, which flowers the last of July, is one of our handsomest wild flowers. It usually grows about eighteen inches high, is much branched, and bears an abundance of rose-pink flowers a little less than an inch across and deliciously fragrant. It is a variable plant in size, sometimes only six or eight inches high, and bearing a single flower, and, again, at the other extreme, it may be nearly three feet high, much branched, and with an abundance of bloom. Its natural home seems to be in rich moist soil.

Lepachys columnaris is a pretty species of the Composite family. Its height is about eighteen inches, and it branches from near the base. The disk or centre of the flower is columnar, nearly or quite an inch long. From its base project the numerous bright yellow rays which, though shorter than in the other species (*L. pinnata*), have the same half-drooping habit which gives the flower a peculiar and attractive appearance.

Helianthus mollis, a species of Sunflower scarcely three feet high, with simple leafy stems and large yellow flowers three inches wide, is common in dry soil in western Illinois and Missouri. The flowers when open usually face the horizon, which makes them more conspicuous. It is quite attractive when in bloom, and will live in any ordinary soil in the sun.

Primula Mistassinica, one of our rarest and most delicate little Primroses, is proving a fine plant in cultivation, where it attains a much larger size and produces larger and handsomer flowers than when growing wild. It is an early bloomer, and is, I believe, usually past flower by the middle of June, but in our nursery the past season it not only began blooming early, but continued to flower at intervals all summer, and several plants are now blooming in the middle of August. It needs a light loamy or sandy soil, with partial shade.

Habenaria ciliaris (Yellow-fringed Orchis), a native of wet sandy soil from New England to Florida, is one of the most attractive of this genus, and flowers about the middle of August. It grows from one to two feet high and bears a thick spike of orange-yellow blossoms. It is a good plant for the drier portions of the sand-bog.

Calochortus Bonplandianus is a Mexican species, which attains a height of a little more than a foot, and bears in long succession four to eight handsome bell-shaped pendent flowers, dark purple and light green outside, and yellowish purple within. The flowers are over an inch long by nearly three-fourths of an inch in diameter. It is a strong and healthy-growing species, though probably not hardy, and should be wintered in the cellar. Unlike any other Calochortus I have seen, it bears numerous little bulblets in the axils of its leaves, like the Tiger Lily, by which it evidently propagates itself.

Charlotte, Vt. *F. H. Horsford.*

Garden Phloxes.

VARIETIES of *P. maculata* and *P. paniculata*, and commonly known as the Decussata varieties, are indispensable at this season of the year, and they, together with Sunflowers—perennial and annual—are now among the showiest border-plants. Owing to the ease with which they may be propagated, and the thoroughness with which they take care of themselves, gardeners often become careless about preserving the best varieties true to name. Seedlings spring up profusely about old plants, which, if not carefully watched, will gradually crowd out the parent plant, and, as seedling varieties rapidly revert to the purple-colored type, one not infrequently sees, in neglected borders, masses of Phloxes of this color alone. On the grounds of Mr. Fewkes, of Newton Highlands, Massachusetts, I lately saw some particularly fine Phloxes among fifty or more varieties in his trial grounds. I selected, as very distinct, Panama, Snowflake, Josephine Gerbeaux, Beldonville, Saison, Liervalle, Superba and Delicata. Fifty years ago Phloxes were grown as pot-plants for conservatory decoration, but, while beautiful, their period of usefulness was of short duration, owing to the fugacious character of the corollas. Where Phloxes are made a specialty, and grown in masses, frequently of one color, the practice is to strike cuttings in spring and grow the plants in six-inch pots until they attain considerable size. It is easy then to plant and so arrange them to have a good even-surfaced bed when in bloom. Raising Phloxes from seed is a very interesting pastime and should be popular with amateurs. They self-fertilize

so easily that it is rather difficult to get what result you desire, but out of a batch of fifty seedlings there will usually be a few worth selecting.

Flowers for Late Summer.—A bed of Ghent Azaleas below the pavilion in Mr. Walter Hunnewell's garden makes a lovely picture in spring, with a few blue-flowered German Iris and Columbines dotted among them, as their colors harmonize admirably with the yellow-orange and the pink of the Azaleas. Though gorgeous while they last, their blooming is short and so early in the season that we fill out the bed with Dahlias, Gladioluses, Tritomas, Crocosmias, Galtonias, Sunflowers and various other summer-blooming annuals, which keep up a continuity of bloom and furnish abundant flowers for cutting. The bed is thus kept gay when otherwise it would remain dull and unattractive through the long summer. While the rock garden shows to better advantage in spring than at any later season, we nevertheless have a few flowers at all times. Conspicuous for a long time have been *Campanula grandiflora*, var. *pumila* (*Mariesii*), the best of all the Chinese Bellflowers; *Œnothera Missouriensis; Clematis Davidiana*, a lovely bush-Clematis, with small, tubular, light blue flowers, which are fragrant; *C. tubulosa*, of similar habit, but dark blue flowers, and a neat trailing Rose, *R. bracteata*, with large white flowers. *Campanula rotundifolia*, the true Blue Bell of Scotland, and *Geranium sanguineum* are all worthy of note at this season.

Wellesley, Mass. *T. D. Hatfield.*

Baptisias.—Some of these native plants are worthy of a place in the garden. They are all herbaceous perennials, and useful for filling-in large mixed beds or borders and for dotting among shrubs of dwarf growth. *B. australis*, the Blue False Indigo, is perhaps the best species. It is found wild from Pennsylvania westward to Arkansas. The growth is dense, and the numerous stems and branches are thickly clothed with ternate leaves of milky-green color. The large flowers, like those of the ordinary pea in form, are borne in racemes from eighteen to twenty-four inches long, the largest of which carry from thirty to forty flowers during the month of June. *B. leucantha* is a foot taller, with larger leaves, but less compact in habit, the stems branching only at the top. The flowers are white, and the plant, which also blooms in June, is common in the south. *B. tinctoria*, Wild Indigo, the common way-side plant, is the most floriferous species. It resembles *B. australis* in general habit, but is smaller in every respect, and bears quantities of yellow flowers in June and July. These plants thrive luxuriantly in any ordinary garden soil, and in any position not exceptionally dry or too much shaded by overhanging trees. They stand severe drought much better than a great many of our herbaceous plants, and that is a matter of some importance in dry seasons. Propagation is readily effected by division of established clumps early in spring, or by the seeds, which ripen freely.

Cambridge, Mass. *M. Barker.*

Correspondence.

What is a "Garden"?

To the Editor of GARDEN AND FOREST:

Sir,—I wish I always had time to thank you fully for your various references to my words, but I cut the following from your number for July 24th, and wonder a little at it:

> For example, Mr. William Robinson, writing recently in *The Garden*, used the word "garden" to indicate the grounds forming the immediate ornamental environment of the house, though this word is commonly employed to designate a place in which flowers are grown. He explained, however, that the lawn must be "the heart of an English garden." To indicate these same grounds Mr. Parsons uses the word "lawn," although the very first sentence of his first chapter explains that "to the minds of most readers the lawn suggests simply grass." He might better have employed the term "home grounds," a term that once was generally used, but now appears to have gone somewhat out of fashion.

Country places and gardens are so different in America that these may explain your writer's doubt, but to us there is no confusion, and as gardening is of such long-standing importance with us we may perhaps be allowed to define a garden! Certainly it is not confined in any such way as this paragraph suggests, but broadly means the whole of the grounds given to gardening of whatever kind it be. There are all sorts of gardens. Of course the lawn is generally a part of the garden, save in few cases, where very large lawns would be formed for archery or any like game. "Home grounds"—home lands—may be rightly used as regards the ornamental parts of the garden, but the grand old name of garden covers all. In this country, where there are inconceivable degrees in the size and nature of gardens, any kind of classification of them is not possible or desirable, but we agree in the term garden for all. We say Glasnevin is a fine garden, and of Longleat, the gardens—two wholly different kinds of garden—are beautiful.

The way you use the term landscape-gardener shows the range of the word, and, of course, his work has more to do with the ornamental parts than with the gardens for fruit or flowers.

Office of *The Garden*, London. *W. Robinson.*

How the Red Cedar Grows in New England.

To the Editor of GARDEN AND FOREST:

Sir,—I recently purchased nine extra large Red Cedar posts to support the floor-timbers under a new barn. These averaged three feet in circumference near the ground. On counting the rings of growth, I was surprised to find that there were but seventy-six in the largest of them, and that a third of these were in the inch and a half of white sap-wood which surrounded the heart-wood. These Cedars grew among other large trees, on a strong loamy soil in the town of Danvers, Massachusetts.

Marblehead, Mass. *J. J. H. Gregory.*

Periodical Literature.

A Ride Through the Caucasian Mountains.—I.

DR. DIECK, the well-known German dendrologist, has begun to publish in *Gartenflora* an account of the journeys he made last summer in the Transcaspian provinces, and we have thought that an abbreviated translation of his first article, which is called "The Primeval Abchasian Forest," might interest our readers.

Going by steamer from Odessa the author landed at Suchum Kale, where he found both a public and a private botanical garden. Here, as well as in the town parks and avenues, a subtropical vegetation predominates, so that one might almost think one's self in Palermo or Alexandria. The Albizzia and the Sterculia are the favorite trees, but the Diospyros, the Eucalyptus and the Paulownia also occur with many Palms, and what Dr. Dieck, pursued by memories of prevailing European fashions, rather plaintively calls "the unescapable variegated Negundo." Mexican, Californian and Indian conifers flourish admirably, and one of the most beautiful objects near the shore is a fine group of *Pinus insignis*. Indigenous plants are, indeed, almost wholly neglected, for only the Cherry Laurel and the Date Palm appear in any quantity, mingled with acclimatized Pittosporums and Escallonias, Evonymus and Magnolias, Myrtles and Pomegranates. The Tea-plant also grows so well that Dr. Dieck believes Russia might supply itself with the greater part of the enormous quantity of tea it consumes if the many hundred square miles of now unused land in the Transcaucasian region were to be devoted to its cultivation.

But the traveler's chief wish was to explore the virgin forests of the Caucasus where "uncontrolled nature reigns in mountain regions which have been almost depopulated by emigration, and where only on the borders of the sea is the axe of the wood-cutter beginning its work of destruction." Accompanied for a time by a number of companions, some of whom were scientific students, he noticed first, as the road from Suchum skirted the water, impenetrable thickets formed by *Paliurus aculeatus*, *Hippophae rhamnoides* and a high-growing Rubus with pale blue-green branchlets and gray-green leaves resembling *R. tomentosus*, which is one of the most characteristic plants of the Pontine coast.

After passing the Kelasuri and Madschara Rivers a fruitful, and, in places, marshy region was reached, the region of Alders and Pterocarya, of Smilax and wild Grapes. In the distance little appeared except *Salix alba* in a form peculiar to the Orient, which has very sparse foliage, so that though the trees are finely developed they have a thin appearance. Among these Alders and Willows the *Pterocarya fraxinifolia* made a fine effect, although the author says that he seldom found it growing as well as it does in Germany, the trees having a tendency to branch at or near the ground and assume a shrubby habit.

Carpinus Betulus, *Quercus sessiliflora* and *Diospyros Lotus* appear as the road turns inland, accompanied by *Rubus meridionalis; Smilax excelsa* and *Clematis vitalba* swing themselves from tree to tree, and, with the Brambles, make a jungle of the forest whence the trees valuable for timber have been cut away. Among the shrubs almost everything else is crowded out by a European Elder and Fern (*Sambucus Ebulus*

and *Pteris aquilina*) and an American immigrant, *Phytolacca decandra*, which "has taken southern Europe and the Orient by storm." This plant, although it was only the middle of August, had partially assumed its beautiful red autumn coloring; its dark purple fruit was attractive to the eye, and, although only a Caucasian stomach, says the author, can long endure it as food, its juice is consumed even by the most civilized, as it is now the chief material used in the south for coloring wine. "Where these three plants have established themselves, and, unfortunately, this means in almost all the low portions and middle ranges of the Caucasian mountains, every other plant is crowded out, and agriculture can be pursued only with indescribable difficulty."

At a height of about 300 metres above the sea-level the vegetation changes. The delicate *Carpinus Duinensis* mingles with *C. Betulus* and *Tilia rubra* and *T. platyphyllos*, *Alnus incana* and *Ulmus elliptica* (largely cultivated in European gardens as *U. Sibirica*) associate themselves with the Oaks. With this dark-leaved Elm stands a light green Maple, *Acer Lobeli*, Ten., var. *colchicum*, and the undergrowth of the wood is richly varied, forms which have immigrated from the north mingling with the children of the south. Near the wild Fig-tree grows the European Buckthorn (*Rhamnus Frangula*), and beside *Rhododendron Ponticum* the common Hazel. The Cherry Laurel mixes with Willows, and the common with the Colchican Ivy; and with the Poet's Laurel stand the Spindle-tree and *Cornus sanguinea*, the berries of which in this rich soil and warm climate attain the size of small cherries. *Staphylæa Colchica* shows both the three-foliate and the five-foliate leaves which have puzzled botanists to decide which is the characteristic form.

As the mountains are penetrated the road becomes steeper, so that carriages are exchanged for saddles; the country grows more romantic, the soil richer, and vegetation ever more and more luxuriant. Azaleas now accompany the Rhododendrons, and the Colchican Ivy and the Wild Grape seem endeavoring to smother the trees and shrubs in their embrace, or hang in garlands from the beetling rocks. Deep below in a ravine rushes the river, half overgrown with Ferns and large-leaved shrubs and fringed by the ubiquitous Alder. Crossing this by a rickety bridge, travelers emerge from the fresh dampness of the forest on to a sun-burned highland with vegetation of a wholly different character. *Rubus meridionalis*, which had been seen on the sea-shore, reappears with the Burning-bush (*Cotoneaster Pyracantha*), luxuriant wild fruits, and various Roses, which seem to feel very happy on this soil. Here is a newly established agricultural colony, where fruit-trees offer grateful shade, but give fruit of no very delightful quality; hence the way leads for many hours through thickets of Alders, and near Antkjel may be seen the remains of an old Box-tree forest. This tree is now rare even in the Caucasus; a wood containing about 20,000 trees, ranging up to two feet in diameter, still stands at a higher elevation near Bsipp, but has recently been purchased by an English company for nearly one million dollars. A Box-forest, says Dr. Dieck, is the genuine forest of the fairy-tales. "No soul can be so dull as not to feel its influence. Hardly a ray of sun can penetrate its thick roof of foliage; perpetual twilight and solemn silence reign within it. All the trunks, all the knotted branches, all the twigs are thickly covered with long trails of moss, while the dark soil beneath bears only a rare tuft of Ferns or group of shrinking Fungi. No bird's voice is heard, no insect whirs through the air; only the rustling of the tree-tops and the moaning of the wind-twisted boughs breaks the church-yard stillness of this ghostly wood."

The Florists' Convention.—II.

Extracts from Papers Read.

WE herewith offer, in addition to our report of last week, a few more extracts from the more important papers read at the Convention of American Florists, held in Toronto a fortnight ago.

THE FUTURE OF HORTICULTURE IN AMERICA.

In treating this subject Mr. W. A. Manda, of Short Hills, New Jersey, began by quoting the statistics from the census bulletin on floriculture to show the remarkable growth of this industry, which had largely come into existence during the last quarter of a century. The business establishments devoted to floriculture now use more than 38,000,000 square feet of glass and cover about 900 acres of ground, and their total value amounts to forty millions of dollars, while the annual sale of plants and flowers amounts to nearly thirty millions of dollars. It is a mistake, however, to measure the standard of excellence in horticulture by financial success alone, for this ought not to be considered a trade but a profession, which is connected with science on the one hand and art on the other. It is a fact that the very ablest horticulturists of the past and the present, the men to whom the public owes a debt of the highest gratitude, have not generally amassed fortunes. This is hardly an encouraging business statement, and yet the speaker hoped that commercial florists would continue to devote more labor and study to matters which would benefit posterity. A florist, for example, who has six greenhouses filled with plants which bring a remunerative income, might afford to have a seventh for a special class of plants which he favored and which he might improve by cultivation and bring up to such a standard of excellence as has been reached by several classes of plants already. When we see the original forms from which the Rose, the Pansy, the Carnation, the Chrysanthemum and the tuberous-rooted Begonia have been developed, and compare them with the present condition of the plants, we are filled with wonder, and we cannot doubt that many other plants, by careful cultivation, selection and cross-fertilizing, can be brought to the same state of perfection. Work of this sort might re-imburse the raiser for his trouble, and it would certainly entitle him to a name and a high rank among horticulturists.

As the population of the country grows, and after the bare necessities of life are secured, the next thing which people demand is the beautifying of their homes with trees and shrubs and plants. As wealth accumulates and the leisure-class multiplies, conservatories and greenhouses will be demanded at all the large mansions near towns and cities, and the demand for fine tropical plants will grow year after year. Clubs and societies where flower-loving people meet to hear essays on topics connected with the art of horticulture, are centres of good influence, and as new members are attracted they are fired with enthusiasm. Public and private exhibitions, too, are the means of interesting the public, and, probably, half the amateurs who have fine collections of plants have begun to collect them after visiting an exhibition of this kind. Public gardens and parks are also potent means of increasing the love for beautiful plants. Such parks and gardens not only afford rest and recreation to the weary, but they instruct visitors, and many of these will here begin to have a longing for the possession of plants and the pleasant experience of cultivating them.

The flora of this country furnishes an ample field for years of study. Its large area, reaching from the cold north to the tropics, furnishes varieties of soil and conditions which, by judicious selection, will suit any plant. It will be only a few years before the tide of traffic will turn, and more plants will be exported from this country than are imported. With our proximity to tropical South America, and communication with the East Indies, we shall be able to introduce and establish tropical plants and compete favorably with any producers in the world. It has been said that the comparatively high wages in this country prevent the successful growing of plants for competition in the markets of the world. But Nature helps us here. We have a more favorable climate, so that many plants make as much growth in one season here as they will make in two seasons in Europe. The methods of cultivation used here are far simpler and better than those abroad, and this will help to neutralize the expense of higher wages. And while we are now exporting only Tuberoses, Orchids and a few bulbs and seeds, we shall in time grow all our own Azaleas, Tulips, Hyacinths, Lilies-of-the-valley, and many other plants, not only for home consumption, but for export; for we are sure to find in various parts of this large country the climate and soil adapted to plants which thrive in Holland, Belgium, the south of France, and in England.

FLOWERING PLANTS FOR DECORATIVE USE IN WINTER.

W. H. Taplin, of Holmesburg, Pennsylvania, read an essay on this subject, which he said might be conveniently divided into three heads: (1) Plants that bloom naturally during the winter season; (2) plants forced into flower during the winter; and (3) bulbous plants suitable for decoration, the first section, perhaps, being the smallest. There are a few special qualifications necessary to render a plant valuable for this particular use, such as graceful form, decided color, moderate rapidity of growth and ease of culture under ordinary conditions; the latter point being of special importance.

Among the plants of the first section the Poinsettias deserve a prominent place, for where vivid color is wanted they meet all requirements, and as the colored bracts of these plants

keep in good condition for several weeks there need be but little loss from waste of flowers. The original species, known in catalogues as *P. pulcherima*, is perhaps the most satisfactory for all purposes, though the double form of this is showy, and keeps well if water is not allowed to lodge among the bracts. The variety Major is also pretty, the color being crimson rather than scarlet, like those of the type. Either of these, to be useful for decorations, should be stocky, well-grown young plants from summer cuttings of soft wood. They may be made to produce one large head of bloom on a well-furnished plant in a five or six-inch pot. *Plumbago rosea coccinea* is another brilliantly colored winter-flowering plant, whose terminal spikes are clothed with red flowers about an inch in diameter. It is not new, by any means, but it deserves a more extended use. It is easy to propagate and it flowers with the least encouragement.

The flowers of Cinerarias have of late been wonderfully improved in size and color as well as in methods of cultivating them. A cool, moist atmosphere and generous supplies of fertilizers seem to be all they need. To keep up a succession of bloom more than one sowing of seed should be made.

Usually, yellow flowers (except Chrysanthemums) are somewhat scarce, so that old-fashioned plants with yellow bloom, like *Reinwardtia* (*Linum*) *trigyna*, ought not to be overlooked; these may be grown into bushy little plants in five or six-inch pots with but little trouble. *Erica hyemalis*, now quite frequently seen in our larger cities, is the most useful of its genus in winter; it is of free growth, when given reasonable care, while the long sprays of rosy tinted flowers give an additional charm to many tasteful decorations. Although the red and yellow flowers of *Libonia floribunda* are small, they are produced in such profusion as to render the plant quite showy. Another point in favor of this plant is its ability to endure neglect without showing signs of injury.

Chrysanthemums should, of course, be included in the decorative list, but all that needs to be said of them here is, to use only those with distinct colors, and to grow only enough varieties to secure a succession of bloom for as long a period as possible. Pot-plants of Carnations, Bouvardias, Roses and the well-known subjects suggest themselves naturally.

Primula Sinensis, in variety, are most useful for winter work, one of the best being the double white sort. Among the single-flowered forms a range of color, from white to dark red, including lilac shades, from the palest to deep purple, is wide enough to satisfy all tastes.

At the head of the list of plants which can be forced into flower the best varieties among the Indian Azaleas are Deutsch Perle, Fielder's White and Borsig, for white, with Madame Vandercruyssem, Eugène Mazel, Vervæniana and Bernhard Andreas for colored flowers. Some of the hardy Rhododendrons are easily forced, while hybrids from the East Indian species bloom at almost all seasons. Many of these are singularly beautiful, and, if they could be reproduced in quantity at a reasonable cost, would doubtless find a ready market.

Prominent among hardy shrubs for forcing come the Lilacs, which are the most popular, both because of their beauty and the ease with which they may be flowered. The Japan Quince has also proved easy to force into bloom, although the flowers are much paler in tint than when naturally produced. Some of the shrubby Spiræas, like *S. Thunbergii*, will bloom in winter as readily as *Deutzia gracilis*. *S. Van Houttei* is better still. Some of the Hydrangeas produced within recent years are admirable, but are, perhaps, more satisfactory toward spring. The practice of growing on summer-rooted cuttings of Hydrangeas into nice small plants in four or five inch pots, and bearing one head of bloom, gives good material for winter and spring work.

It would be worth while to try either white or pink Crape Myrtle for winter forcing, for, if successful, they would prove admirable additions to the stock of decorative plants. *Acacia pubescens* and other species are valuable for their pale yellow flowers, and no plants excel them in graceful habit. *Cytisus Canariensis* and *C. racemosus* furnish a deep shade of yellow, and are invaluable in other respects.

Among bulbous plants for winter decorations *Cyclamen Persicum* deserves first mention, especially since it has been so much improved by careful crossing. The most approved method of cultivation is to grow the plants on from the seed to flowering size without any period of rest or drying off, the whole operation being completed in fifteen to eighteen months.

"The best is the cheapest," is a proverb which applies with full force to Cyclamen-seed. By starting with a good strain, and then carefully selecting some of the best plants for seed-bearing, it is possible to still improve the stock to a wonderful degree.

There is no need to name the various useful Lilies and Amaryllises; and of the Dutch bulbs the only point worth emphasizing now is to grow only those with flowers of clear, distinct shades of color, as no others will prove satisfactory in combinations.

BEGONIAS.

Mr. John Chambers, Superintendent of Parks of the City of Toronto, read an essay on the value of these plants for bedding and for in-door decoration, with notes on the cultivation of the different classes. We quote, in part, his remarks on the tuberous-rooted section:

Both the double and single varieties include all known colors except black and blue; we have the purest white to the darkest maroon; all shades of yellow, from straw-color to old gold; reds, pinks, and salmons of every shade, and many that take on two or even three distinct tints. Flowers of the single sorts that will cover my hands are not uncommon, and the double ones attain almost the same size. In cultivating the tuberous Begonia you may start with seed or bulbs, or both. The seeds should be new. If you have any shallow pans clean them thoroughly, use plenty of crocks at the bottom, mix a light compost of peat with a little well-decayed leaf-mold and sharp sand, after covering crocks with dry moss to keep the soil from running amongst them. Fill the pan to within half-an-inch of the top, press lightly, sow your seed very thin (this is an important point), and cover with a thin layer of silver sand; water well, cover with a piece of glass, and shade from the direct rays of the sun. As soon as the plants are large enough to handle, prick out immediately into shallow pans, with as little delay as possible, as this is one of the secrets of success. Keep shifting into larger pots until the time for rest, then gradually dry off and place in a dry shed or cellar. The seed should have been sown as early in the spring as possible. Now that you have nice young tubers knock them out of the pots carefully, throwing away those that have been attacked with dry-rot.

Procure a few shallow propagating-boxes and some leaf-mold, and place the tubers in this about one inch apart, till they commence to make a few roots, by which time you will have had some clean five-inch pots ready for their reception. A light potting soil will do for this shift, but when it comes to seven, ten and twelve-inch pots, into which you can easily shift them in one season, the following is a good mixture: Say to fifty parts of fibrous turf add twenty-five of good peat, ten of leaf-mold, ten of sharp sand, and five of rotted manure or bone-dust. Mix thoroughly and pot lightly. Begonias of this section are gross feeders, so when they have had their last shift and the pots are full of roots, a good top-dressing and a liberal supply of liquid cow-manure, applied three times a week, will help them. Some varieties will require pinching, but one must be guided by common sense in this respect. A light, airy, span-roofed house is the best place to grow them, with plenty of shading on sunny days. Syringing in the early part of the day is also very beneficial. Tobacco-stems placed around the pots will help to keep down green-fly. For bedding, a partially shaded situation is most suitable, and they should be planted in from four to five-inch pots. Keep well watered, and they will well repay any trouble in that direction.

Mr. David Allan's paper on the Possibilities of Subtropical Gardening was carefully prepared, and gave a list of the best Palms, Cycads, Tree-ferns, Musas and Dracænas which could be used with Castor Beans, Cannas, the ornamental grasses, and other less costly plants. He considered as favorable places for subtropical planting the open squares or courtyards of large hotels and other buildings. There the Banana would make a perfect leaf without being torn with the wind. In such places Palms, Dracænas, Cannas, Caladiums and Musas would be appropriate. The same space could be filled in autumn with Retinosporas in variety, and other conifers.

Of new Fuchsias Mr. Hill mentioned the Countess of Aberdeen as worthy of note on account of its near approach to a pure white in color. When grown in a slight shade both the sepals and the corolla are absolutely white, but in sunshine it turns slightly pink. It is an interesting novelty, and will probably prove the forerunner of a race of Fuchsias of quite a distinct color.

The essay of Mr. Benjamin Grey, of Walden, Massachusetts, contained a brief history of the use of aquatics as garden-plants, with notes on the cultivation of some of the best varieties for planting in natural ponds or artificial basins.

Notes.

At this season, when comparatively few good shrubs or trees are in bloom, the large white flowers of *Gordonia Altamaha* make a striking display. They bear some resemblance to those of the smaller Magnolias, while the plant thrives in Philadelphia and southward under the conditions favorable for Rhododendrons.

The Florida Fibre Company have secured a tract of more than 1,300 acres of land fifty miles south of Jupiter Inlet, in the latitude of the northern Bahamas, and they are setting out 200,000 plants of Sisal Hemp. The company have erected houses, provided boats and implements, and will be prepared to begin to manufacture whenever the growth of the plant warrants it.

Warm weather and frequent rains have encouraged a most vigorous growth in the large Croton-beds in Fairmount Park, Philadelphia, and they are now exceptionally brilliant. There are four circular beds that are each more than twenty feet in diameter, and also one rectangular bed about thirty-five feet in length, all of which are filled with various-colored Crotons, and edged with a line of golden Coleus.

Many of the famous trees of Laurel Hill Cemetery have been lost because the owners of lots have the privilege of cutting as they will on their own ground. Mr. Joseph Meehan, however, writes that there is still standing there a Cedar of Lebanon which is probably the best specimen in the vicinity of Philadelphia. It is some seven feet in circumference, and from sixty to seventy feet high. A large number of cones which hang from its branches make it an exceptionally interesting and uncommon object.

In a paper on Blackberries, recently read before the Wisconsin Horticultural Society, Professor E. S. Goff said that in our so-called improvement of fruits we have generally failed to improve the quality. Our most productive blackberries are large and beautiful, but they are inferior in flavor when compared with the wild ones found along the fence-rows of back pasture lots. Imagination and association have some influence on our sensations, but, after due allowance is made, the perfume and flavor of a wild meadow strawberry will put to shame our Jessies and Warfields. Perhaps the richest field before experimental horticulturists in America is in the direction of improving our native fruits, and of these fruits the blackberry is one of the most promising. The Dewberry has low habit and delicious, juicy fruit, characters that may be profitably combined with those of our Blackberries. Professor Goff esteems the old Dorchester, now almost entirely neglected, as the variety most closely approaching the wild blackberry in flavor. This should be revived, and crosses should be made with it upon our more hardy and productive varieties.

In *Scribner's Magazine* for September there is a picture of the sacred Bo-tree of Ceylon, from a photograph by Mr. James Ricalton, who states that it has stood for 2,130 years, according to authentic records, and is probably the oldest historical tree in the world. The Bo-tree (*Ficus religiosa*), in all countries where Buddhism prevails, has become a consecrated object, and may be seen on the road-side, about houses and temples and in towns, protected by masonry, over which shrines are placed for homage-offerings. This particular tree in Anuradhapura crowns the uppermost of three successive terraces; it has a multiple trunk, and its several divisions are feeble and gnarled, while its leaves lack verdancy and vigor and show the pallor of decrepitude. The soil about its roots is almost saturated with the oil of its anointment, and yet it spreads its protecting arms over its devotees while they deposit their offerings about it. All of them are eager for a single leaf, but no one would dare pluck it from the tree, for it must fall in full maturity to yield its highest merit. When one of these withered leaves loosens from its branch and comes sailing down there is a pious scramble among the multitude, a collision of zealous heads and hands, and then the solitary leaf is borne away in the happy bosom of the successful competitor.

We learn from foreign journals that the plants cultivated in Italy and the south of France for the yield of essential oils have suffered so from the severity of the last winter as to considerably impair the market supplies. Oil of Bergamot is exceedingly scarce in Italy and brings higher prices after every transaction. The principal plants cultivated in France for essential oils, which have been most damaged by last winter's frosts, are Thyme, Rosemary, Lavender and Pennyroyal, and the output of Geranium oil in Spain will this year be very small. The Peppermint crop in England has been winter-damaged, especially on the heavy damp soils and on the more exposed positions, so that some of the plants were taken up. Lavender, also, has suffered severely, especially the old plants, of which the frosts have apparently made short work, nearly all being killed. During the closing week of April the price of the oil advanced from about thirty-five shillings to forty shillings per pound. The Camomile plants have also suffered. It is worth noting that the first consignment of Cassia pomade shipped from British India was recently received in London. It was only a sample shipment, but, if successful, it may be the precursor of large quantities, as the flowers (*Acacia Farnesiana*) are found growing wild in abundance. It is claimed for the Indian pomade that it is very considerably stronger than the strongest French.

Mr. Edward Whittal writes to *The Mayflower* from Smyrna very pleasantly of his excursions to the mountains, where he has been collecting Chionodoxas. Besides the original *C. Luciliæ*, discovered by Mr. Maw, he found the first variety of this plant on the Mahmout Dagh, and named it Sardensis, from the beautiful plains of Sardis, which lay before him. This plant is of a darker tint than *C. Luciliæ*, and the intenseness of its color where many plants were grouped together, with a background of rocks, made a picture not to be forgotten. This variety of the Chionodoxa has white and pink sports, and it is an acquisition for the rockery or wild garden. Mr. Whittal found the third Chionodoxa on the Tmolus range of mountains. It is a smaller, but brighter-colored, plant than *C. Luciliæ*, and he named it *C. Tmolusi*. It has been considered by some botanists as identical to the one discovered by Mr. Maw, but in its wild state the difference between the flowers is very marked. No white or pink sports of this plant have been found. It was near this third Chionodoxa that Mr. Whittal found the variety which he named Gigantea, from its more massive flowers. The coloring of this plant is not so brilliant as in the type, but this deficiency is made up by its size and by the erectness of its flower-scape. It varies in color more than the other Glories of the Snow, and when well established it will be sure to attract attention.

A recent bulletin of the Chicago Academy of Sciences is devoted to the flora of Cook County, Illinois, and a part of Lake County, Indiana. It has been prepared by W. K. Higley and Charles S. Rudden, and includes 1,336 species and varieties, of which 177 species and five varieties have been introduced. From a brief chapter treating of plants which merit special attention by reason of some peculiarities in form or habit, we quote the following: "Situated along the shore of Lake Michigan is a class of alien plants whose natural habitat is in the vicinity of salt-water. Of these saline forms the Beach Plum, among the trees, is most interesting. All along the shores of the lake the bright flowers of the Beach Pea (*Lathyrus maritimus*) can be seen during the summer months lifting their heads above the sand, while among them at Evanston, and also at Wolf Lake and Clarke, Indiana, the Saltwort (*Salsola Kali*) is sparingly found. Leaving the lake-shore for the more marshy districts inland, several parasitic forms are found. Under foot the Corpse-plant and Cancer-root rear their pale forms above decaying vegetable matter on the roots of other plants, while three species of the Dodder twine their waxy stems around the stalks of the Helianthus and other species of *Compositæ*. Occasionally exceptional forms, such flowers differing in color from the characteristic hue and double forms, are recorded. A number of albino forms are included, among which may be mentioned the Cranesbill, Red Clover, Columbine, Blazing Star, etc. Many double forms among the species of Helianthus, Coreopsis, etc., have also been found in all stages of development."

Catalogues Received.

Wm. C. Breck, Allegheny, Pa.; Autumn Bulbs.—William Bull, 536 King's Road, Chelsea, London, S. W., England; Tuberous-rooted Plants and Bulbs.—Haage & Schmidt, Erfurt, Germany; Autumn Flower Bulbs and Roots.—William Baylor Hartland, 24 Patrick Street, Cork, Ireland; Key to Hartland's Floral Album of Daffodils and General Bulb List for 1891–92.—Hitchings & Co., 233 Mercer Street, New York, N. Y.; Water Heaters for Baths and Laundries; also Hot-water Heating Apparatus for greenhouses, graperies and all glass structures, and dwellings.—E. H. Krelage & Son, Haarlem, Holland; Dutch Flower Bulbs.—E. W. Reid, Bridgeport, Ohio; Pot-grown Strawberries, Small Fruits, Ornamental Shrubs, Roses, Grape-vines, etc.—Lewis Roesch, Fredonia, N. Y.; Fall Trade Price List of Grape-vines, Small-fruit Plants, etc.—Vilmorin-Andrieux et Cie., 4 Quai de la Megisserie, Paris, France; Flowering Bulbs and Flower Seeds for Autumn Planting.—Thomas W. Weathered's Sons, 244 Canal Street, New York, N. Y.; Hot-water Heaters for Dwellings, Conservatories, Greenhouses, Graperies, Poultry Houses, etc.

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Suggestions to Tree-planters.

INSTRUCTIONS for planting trees may seem untimely at this season, but really this is the time of year when preparation for next year's planting should be made if such preparation has not been largely completed already. Our springs are so short that if any work at all is accomplished at that season it must be hurried through, and planting cannot be thoroughly done in the trying weather which then prevails unless everything is made ready for it in advance. Of course, all planning and mapping should be completed before actual work in the ground begins, and since an essential part of this work is deep digging or trenching in time to allow the ground to settle during the winter, there is little danger that the work will begin too early. There are few labors in which men engage where the difference between the results of thorough work and of careless work is so striking. A little well-directed effort may insure health and vigor to a tree and make it an object of pride and beauty for a century, while the same tree hastily planted will prove feeble and short-lived, and therefore a disappointment, for no tree is beautiful which is not full of lusty life.

One point too often neglected is a consideration of the situation in which various trees are to stand. A so-called ornamental tree, which is feeble or sickly, is always a blot upon the landscape, and no tree can be thoroughly healthy for a long time unless it grows in a soil and situation peculiarly suited to its needs. A Pine-tree will thrive on a gravelly bank, but people who try to grow Maples or Hickories in such a situation will find their labor wasted. Equally futile will it be to plant Chestnut-trees where there is a substratum of solid rock, or ericaceous plants where there is much lime in the land. Of course, it is true that some trees, like the Red Maple and the Bald Cypress, which are usually found in wet ground, will grow when transplanted to uplands; but the best rule for a planter to follow is the one which is set by Nature, and he will be likely to plant with the greatest success who observes most carefully the positions in which the trees he plants are found when growing naturally. It is too often the case that landscape-gardeners or other planters, having been charmed with the beauty of some tree, attempt to use it without considering its special requirements, and this is one reason why so many short-lived and sickly trees are found in elaborately planted parks and private grounds.

Fortunately, this law does not restrict the planter to any troublesome degree, nor does it deprive him of the use of materials needed to produce the best effects. As a rule, swamp-trees appear to better advantage when their feet are in the water. Alders never look so well as they do by a brook-side, so that the planter who considers the wants of his trees, with a view to their health and vigor, will find that by following these rules he is gaining also greater naturalness and beauty in his combinations. Of course, these same rules apply to shrubs and herbaceous plants as to trees, for although the Cardinal-flower and Rose Mallow will bloom when transplanted from the marshes into a dry border, yet the most healthy and beautiful plants are those which are placed in the positions where they are found at home.

There ought to be no need of insisting on the necessity of a thorough enrichment of the soil, for every one knows that, in addition to its proper mechanical preparation, the soil must furnish plant-food of the proper quality. Here, too, a study of trees as they appear under natural conditions will teach a useful lesson. Let any one note the insignificant size and meagre foliage of a tree growing in a thin soil, or on a hungry ridge, and compare it with a specimen of the same species standing in deep, rich, moist loam, and he will have an object-lesson in the value of thorough enrichment of the soil for ornamental planting. An effort to produce immediate effect, as it is called, is often made by planting large specimens, or by grouping them close together, but the best way to secure early effect, as well as lasting effect, is to feed trees well and encourage them to a speedy growth, which is, as a rule, the most healthful growth.

Monuments in Public Places.—III.

THE right placing of out-door monuments can scarcely be called a less important question than their intrinsic excellence. A beautiful statue may be shorn of half its effect if badly stationed, and a good substructure can very seldom be designed unless the destined station is exactly known; while, on the other hand, a fine bit of landscape, or dignified open space in a city street, may be seriously injured by the inappropriate placing even of a work that is meritorious in itself.

We should first remember that, a monument being a palpably artificial thing, the best place for it is where other artificial elements are conspicuous; if in a park, for example, it should be placed at the intersection of roads or paths, on a terrace, or at the side of a formal avenue. No better situation for statues or other comparatively small monuments could be imagined than the Mall in the Central Park, where a long double row, alternating with the symmetrically spaced Elms, would greatly increase the stately beauty of the promenade, as well as its interest to the masses of people who daily frequent it. Commonwealth Avenue, in Boston, with its wide, open walk between doubled rows of trees, is another place which looks as though specially designed to offer hospitality to the sculptor; and it will be well indeed if the entrance avenue of Druid Park, in Baltimore, some day sees its rows of monotonous, ugly urns, suggestive of the "Forty Thieves," replaced by a varied, yet harmonious, series of works of art. In Washington excellent situations, especially for equestrian or other large monuments, are offered by the "reservations," circles or triangles which so frequently break the lines of radiating streets; and, of course, every city has certain little squares and open corners where, alone or in combination with trees and shrubs, monuments of one sort or another would be eminently appropriate.

The French show better taste than ourselves in the placing of their works of sculpture, and a study of their arrange-

ment in such places as the Luxembourg and Tuileries gardens might advantageously be made by our artists and those who have control of our pleasure-grounds. But the French are apt to be less skillful in dealing with a "natural" park than with formal gardens such as those we have named, and here even they sometimes make mistakes. In the Parc Monceau, in Paris, for instance, we see several bronze figures or groups set, at a distance from the road, in the centre of wide quiet stretches of lawn. Such an arrangement seems bad for two reasons. Not only is the repose of the lawn disturbed and its natural character injured by the presence of a conspicuous formal feature—the statue itself is placed too far from the eye to be thoroughly well appreciated.

But in addition to the broad rules which indicate the greater or lesser appropriateness in a general way of certain classes of situations, a number of special points must be considered before any monument can be well established.

One such point is scale, or the relation in size of the work of art to its environment. The figure of Webster in the Central Park stands in an excellent place, in the centre of a large circle where the West Drive is crossed by the road leading to Seventy-second Street. But it makes a poor effect, and not only because it is uninteresting and weak in conception and mechanical in execution; it is out of scale; it is so large that it dwarfs alike the neighboring trees and the passing figures of living men. In another situation it might not produce this effect, while, on the other hand, it would not be hard to point to statues which, if increased in size, would look much better where they chance to stand. Excessive size is a very common defect in the portrait busts we occasionally place out-of-doors, as, for instance, in the Schiller, in the Central Park, and the Irving, in Bryant Park. A bust should almost always be placed near the eye, and, if made very big, produces not an "heroic" impression, but simply one of unnatural and disagreeable bulk. If the situation chosen for a bust demands a comparatively large monument, then the architect should be called upon for an elaborate pedestal. The French appreciate this, and their architectural memorials, crowned by a bust little, if at all, larger than life, are among their happiest creations.

Nor is it only when busts are in question that the architect may help in giving a monument the proper scale. The circle where the Webster stands demands a large monument. An equestrian statue might well have been placed there, as bulk could thus have been secured without any undue exaggeration in scale; but a smaller standing figure on a more spreading and elaborate base might likewise have been eminently successful. Where such a circle is formed not by drive-ways, but by paths, it is usually smaller, and therefore demands a smaller monument for its completion; and every such spot should be supplied with its adornment only after a nice consideration of this question of scale, in full consciousness of the fact that a mistake will injure both the work of art as such and the general effect of the locality.

Another important point is the height above the eye at which a monument will stand. In city streets or squares this is determined simply by the pedestal; but in parks there are sometimes excellent situations elevated above the roads and walks. Statues placed here will be seen not against a background of buildings or foliage, but outlined against the sky, and their silhouette should therefore be considered with more than usual care. The Bolivar in the Central Park, on its little elevated plateau overlooking Eighth Avenue, proves that a bad statue may seem doubly bad when all its outlines are thus conspicuously lifted into prominence; but it also suggests, of course, how greatly the beauty of a good one might be increased by such a situation. Also in the Central Park, not far from the Webster statue, there is a figure of a falconer, which, if not a remarkable, is a pleasing work of art; and its effectiveness is certainly increased by its elevation on a rocky slope, although one might wish this slope had been a little less rural in character, a little better adapted for the reception of so artificial an ornament. A good place for a group or figure which demands a certain elevation to appear at its best is the top of a terrace or the balustrade of a bridge. In many European cities the old stone bridges are adorned with statues, which are themselves admirably shown, while the effect of the bridge is greatly improved; but we can remember no instance in America where the same thing has been done. For a large bridge great groups or equestrian figures are naturally desirable; but on a small one busts or other small works might be very beautiful. We should like to see a park bridge designed with especial reference to the sculptor's subsequent work, and then ornamented with the best that our sculptors now can achieve. Moreover, in such a place, or along the balustrade of a terrace, many men might be fittingly commemorated whose memory deserves to be perpetuated, yet who were hardly great enough to warrant the erection of a wholly independent monument of a more conspicuous sort.

A Brook in the Yosemite.

THE presence of water in some form almost always adds interest to a landscape. The distinct sea, with its suggestion of vastness and sublimity; a great river, flowing by in strength and silence; a placid lake, which mirrors back the light of the skies; the "still waters," which always unite with "green pastures," to form pictures of perfect peace; a running brook, with its sparkle and vivacity—each one of these reveals some of those distinctive qualities which in infinite variety finds expression in objects of natural grandeur or beauty. The brook in the illustration, page 426, which is foaming over a rocky bed, carries us at once into the solitude of a rugged forest-country. The scene might be on the flank of a New England mountain, but the trees along the borders of the stream are unfamiliar to eastern eyes. They are mainly Alders, it is true, but California Alders (*Alnus rhombifolia*), which are found widely distributed from British Columbia into Mexico. The great Alder of Oregon and the northwest Coast (*A. rubra*) becomes a still larger tree than this, often attaining the height of a hundred feet and more; the California Alder, however, not rarely grows to be fifty or sixty feet, although toward the northern and eastern limit of its range it is reduced to the form and size of a shrub. It is peculiar in the earliness of its flowers, which appear in central California in January, or just as soon as the leaves of the previous year fall. In his paper on the Pacific Coast Alders, Dr. Parry says that, "in spite of occasional sharp frosts, the process of fertilization proceeds steadily, and by the 1st of February, at least as far north as the lower Sacramento Valley, it is mainly completed, and the swollen winter streams, over which these trees lean, and the adjoining banks are conspicuously darkened by the effete male catkins, which resemble torpid caterpillars." It is a tree of neat habit, as the picture shows, and it adds to the beauty of many California streams upon whose banks it abounds.

This particular stream is in the Yosemite Valley, and is probably one of the tributaries of the Merced River. The illustration is from a photograph by Dr. H. W. Rollins, of Boston, to whom our readers are indebted for so many well-selected examples of American trees and American scenery.

How We Renewed an Old Place.

XVIII.—LANDSCAPE GARDENING.

WHEN we first purchased this old farm no dream of landscape-gardening crossed our minds. It was not to found a country-seat that we bought it, but simply to get a place to live in, a quiet village home, as indeed it is, where a lovely view would gladden our eyes, where we should have elbow-room, with enough land to cultivate to provide us with an interest, and where we could raise hay for our horses, and, perhaps, a few vegetables for ourselves. A tree or two to shade

us, and some Pines on the hill-side to relieve its dreariness, were in our programme, as well as the Willows along the street, but we felt that we had twice as much land as we needed, and should probably part with a lot on each side of us before very long, instead of wishing, as we now do, for a few acres more.

As in everything else that one begins in an amateurish way, we looked no further along the road we were to travel than the end of its first enticing curve, and little we recked where it was to lead us. To get rid of barrenness was our obvious business, but there was no method in our endeavor beyond the mere putting in of all the trees and shrubs we could muster from the resources of the place, or through the kindness of our friends.

For the first two years it required our best energies to make these live, and there was not much thought beyond digging around them, watering them when dry, and pruning them into shape. But the third summer, when the bare poles began to have perceptible tops on them, and the little shrubs to occupy a substantial space of the earth's surface, we began to be conscious of defects of arrangement, of a lack of meaning and purpose in the picture, and to feel the necessity of a more artistic disposition of our forces. The needs of the place, too, became apparent. The trees that had been planted for shade either showed that they would throw no shadows at all within the next ten years, at the proper hours, or else would throw them where they were not particularly needed. The shrubs in groups looked crowded, the single ones gave a spotty appearance to the lawn that was not to be borne, the drive-ways were too wide and their curves unsatisfactory, while the expanses of turf were too brief for beauty.

Each effort at improvement seemed but to make us the more conscious of our lacks, and while our neighbors were complimenting us upon the improved appearance of the farm, which no longer looked like an abandoned sand-hill, we ourselves were taking counsel together, and coming to the conclusion that the place was a schoolmaster to bring us unto knowledge by the painful road of ignorance and failure.

The conviction that you know nothing is always a hopeful, if a depressing, sign. When the painter feels that his finished picture is a wretched daub, when the writer knows that his last romance is but a thing of shreds and patches, it is a proof that he is still growing, that he has a stronger note to strike, and that his end is not yet.

One of our leading novelists says that his stories are to him like those tapestries wrought by the workman from behind, of which the weaver sees only the wrong side, the knots and ends of the worsted, the seams of the foundation, so that when the public views his finished work with delight, recognizing its sincerity and dramatic truth, the satisfaction of his readers is to him a wonder, since from his own point of view he knows not whether he has wrought well or ill.

All great successes, I fancy, must be surprises to the men who make them, for the discontent of the artist with his painting, of the poet with his verse, of the playwright with his play, is a penalty exacted by the ideal for which men strive, and which all the more surely eludes the greatest, whose imagination is the most far-reaching. When a man is satisfied with what he has done he has reached his limit; from that point he goes down-hill, imperceptibly it may be at first, but none the less surely.

Our own discontent with our landscape-gardening convinces me that we have a future before us for a good while to come. Our picture will bear a lot of working on for many years yet, and in the mean time we have room for a succession of despairs that will serve to keep us properly humble.

But that we have on the north of our house a landscape to evolve that is a true picture no one can deny who looks out upon the ever-changing meadow from the bowery veranda from which we view it with never-failing joy. Not a far-reaching view, but such a one as Englishmen like to paint, a distant hill, a few clustering cottages, a level stretch of meadow with a winding stream; some Willows near at hand. So far so good; but the foreground is the puzzle. It is a muddle at present, being a sacrifice to the utilities, and is more or less disfigured with fruit-trees and vegetables, and piles of sand that have been dumped upon the marsh. A good deal veiled it is, fortunately, by the bending boughs of Pear and Apple-trees laden with fruit, which is their plea for life, and when one is seated, the balustrade of the veranda is an efficient screen, so that one can freely enjoy the pleasing prospect.

The French talk of the *St. Martin des femmes* which comes to them after the *beauté du diable* has long gone by; and our meadow, too, has its fleeting glory of youth in early spring, with Apple-bloom flush, and delicious verdancy to match, and then, after a common-place summer of good looks, it comes to its Martinmas, and burns and glows and smiles with a richness and warmth that are the precursor of the

Hectic of the dying year.

In this mature beauty, which is far more permanent than the more exquisite spring loveliness, there is a great charm. The monotony of July greens has yielded to the deeper tones of the woodland in August. The declining sun casts longer shadows in the afternoon. The grass, along the winding stream now at its lowest, stands up high from the surface of the water, with darkly shaded edges the more apparent that its prevailing tones are russet, with bright golden lights, where the hay has not yet been cut. Here and there the broad expanse shows a hay-cart and a few moving figures, the one touch of life wanting at other seasons to the landscape. The rounded hay-cocks in the distance are lightly shaded on the side opposite the light. There are streaks of red-brown where some of the grass is in blossom, and of vivid green where masses of sedges line the low banks of the tiny winding river, in which their reflections tone the blue through soft gradations to the deepest shadow. A solitary heron floats above the marsh, beating the air with slow strokes of his broad wings. In the evening sometimes the clanging of the wild geese is heard, the first deep tone in the knell of dying summer. Now and then a white flight of gulls comes up from the harbor searching for fish, pouncing down behind the grass after some luckless perch in the water. The shadows of the distant Oaks are darkest blue, and some far-off Elms fleck the front of an orange-colored cottage and subdue it to harmony. The gray roofs and red chimneys of the distant houses and barns, half-buried in foliage, seem an essential of the picture, giving it that touch of humanness without which a landscape lacks its final charm. The veranda-rail, with its drapery of Woodbine, gives a strong accent that brings out the values of the middle distance, while the tops of two old Apple-trees, laden with fruit, make a pleasing curve in contrast to the level lines of the parti-colored marsh, elsewhere broken by the ashy green foliage of some graceful Willows across the invisible road.

So much, at least, our landscape-gardening has accomplished; the ugly line which killed our predecessor has been obliterated by our border-plantation, and, to all intents and purposes, the great stretch of grassy meadow, with its winding stream and its bounding masses of Oak and Maple woods, is our own park, for none of its owners get the good of it as we do. For us it glows with sunshine, or frowns with a passing cloud; ours all this wealth of jasper and chrysoprase and turquoise; as much ours as the silver sheen of the Willows which wave so softly gray against it, and rest the eye from the dazzling tints in which the old marsh arrays herself for the mowers. But the problem that vexes our spirits is that unshaped foreground, and how it may be made to blend more completely with the meadow into one harmonious whole. If the great Apple-tree could but change places with a certain Elm that is of no use in the landscape where it stands the matter would settle itself. Two more Apple-trees to cut down, and you have a composition.

But a Seek-no-further, which bears several barrels of early apples that are very good eating, is not easily to be sacrificed, even to the demands of a landscape, to which it is also advantageous from its height and mass, that could not be reproduced by any planted tree in our day, unless, indeed, we had the purse of Miss Catherine Wolfe to spend thousands in moving giants. If it could be had for the asking, I think I should choose a low, wide-spreading Oak rather than a stately Elm, or possibly the view might be improved if we had no tree at all, but that effect we have from an upper window which may have its balcony some day.

A whirlwind swept up the valley on the twelfth of August and very nearly settled the question for us by making a clean sweep, but, luckily, contented itself with two or three great boughs full of apples, which are hanging now by a slip of bark, in hopes that they may get sap enough through this narrow channel to ripen, but it looks doubtful.

The same storm made havoc in the garden with such tall Hollyhocks and Poppies as had carelessly been left untied, and then whisked a branch from off our great Elm, and split in two a large Swamp Maple on the other side of the street. A five-minute tornado it was, with pouring flood that swept the main street of the village and littered it with fallen trunks and limbs twisted off in its whirling flight; as brief, but more violent a gale I have seen in Maine, cutting a forest into windrows as a mower would cut grass with his scythe.

To make a landscape-garden one must live with it and study it, putting in a touch here and there, as the painter treats his

canvas, now effacing a spot, again adding an accent, blending, harmonizing, even destroying, if need be, and beginning once more. Advice you may listen to, but be not over-hasty to accept suggestion. Weigh each idea well before you admit it, look at it from all sides, for it will always have more than one. It is you who will have to live with the picture, and it is your mind that should lend the individuality that will make the scene your own. It is, after all, the personal touch that is worth while.

A fair woman, who is a summer neighbor of ours, took me the other day through interesting grounds, which her own taste and care had brought into a wild, and yet controlled beauty. Boulders draped with vines, and shrubberies of native growth, lined the long avenue that wound up a wooded and rocky hill-side to a home which overlooks Massachusetts Bay. But the finest feature of the commanding prospect was a glimpse of the rounded hills and silver-shining water of Hingham Harbor, toward which the eye was led over miles of tree-tops. Just in front was a lawn of perfect turf, golden green in the low sunlight, and a little way off, against the blue dome of sky, stood up some heavy Cedars, their black masses of foliage giving just the required force of accent to the foreground, throwing far away into the remotest distance the lovely outline of the Blue Hills of Milton.

Such a picture one cannot forget. Intelligence and taste have added to it the last refining touch. Remoteness is here, and sylvan wildness, contrasted with the gentle charm of well-swept turf, and skillfully subordinated groups of flowering shrubs and plants, that complete, but form no jarring note in the beautiful scene. To me it seemed perfection, but with the eye of the true artist who loves his work, my hostess noted a ledge here, an obtrusive Oak-top there, which, to her fastidious taste, seemed to intrude. For the true lover of nature works forever at his picture, ever sensitive to a new charm, watchful for a fresh effect, rejoicing in each change, painting with a palette of the great Mother's blending, on a canvas of her own contriving, with an impressionism that cannot falsify, and a detail that is never intrusive. In this great school one learns breadth without vagueness, intensity without violence, and softness that cannot be effeminate. The value of atmosphere, the glory of the sky, can never be out of key with the picture, and the "seeing eye," by careful study and patient waiting, can here evolve ideal beauty from material form.

Hingham, Mass. *M. C. Robbins.*

The Weeds of California.—IV.

THE *Rosaceæ* furnish no plant that could properly be classed as a weed in California, save perhaps that the *Chamæbatia foliolosa*, the procumbent "Tarweed" of the Sierra foot-hills, sometimes persists for some years after the land it covered has been taken into cultivation.

Of the *Onagraceæ*, *Œnothera ovata*, the stemless Evening (here more properly morning) Primrose, is somewhat persistent in pastures, and if not suppressed will gradually shade out the grasses with its dense rosettes of leaves. It plays the same part that the several Plantains do in grass-lawns; but its beautiful and abundant flowers plead for its toleration as do those of the Dandelion in Europe and the east. *Epilobium paniculatum* locally invades the moister fields, but is not very persistent.

Of the *Cucurbitaceæ*, two species of *Megarrhiza* (vulgo Big-root), occurring both in woods and open grounds in the Coast ranges, retain their hold on cultivated lands as well as pastures for a number of years, owing to the enormous tubers which, lying from two to four feet below the surface, can be reached only by laborious digging. Persistent cutting off of the shoots will gradually exhaust the tuber, but if allowed to grow even a short time during each season it will continue to send forth its succulent climbing runners almost indefinitely.

The *Cucurbita fœtida* (*C. perennis*, Gray), the Calabazita of the Mexicans, is common in open grounds in the southern half of the state, and retains a place in the fields with some tenacity, on account of the multitude of its gourds and the protection their hard rind affords to the seeds. It covers the ground in wheel-shaped masses eight to twelve feet across, and, of course, is a very unwelcome visitor in all cultivated grounds. But by cutting off the perennial root-crown and picking up gourds for a season or two it can be readily extirpated.

Of the large and largely represented family of the *Umbelliferæ* scarcely one can be counted as a seriously obnoxious weed. The Fennel, heretofore mentioned, is a hardy roadside weed, but is easily dealt with in cultivation. The Caraway makes no headway; the Anise and Coriander retain a place in fence-corners, but do not spread. The Celery seems to have escaped from cultivation into wet grounds, and sometimes covers them thickly, but quickly yields before culture. The Carrot is abroad in woodlands and pastures, but is not troublesome. Of the numerous native species, *Sanicula Menziesii* and *S. bipinnatifida* are apt to maintain themselves in pastures for some time, as do certain species of Peucedanum and Caucalis, as well as the large *Heracleum lanatum*. But none of these can be accounted serious pests in cultivated ground.

Of the *Rubiaceæ*, the native Galiums are quite innocent of harm; Diodia, so troublesome in the Cotton states, is occasionally seen, but makes no headway. *Rubia tinctorum*, however, spreads energetically in heavy soils, and would doubtless prove a serious pest were it to escape from cultivation.

Of the *Dipsaceæ*, as stated above, the Fuller's Teasel has become a common roadside weed in the Bay region, and runs riot in waste grounds; it could doubtless be cultivated to great advantage in this genial climate could a market be found for it. The garden Scabious, also, has escaped from the gardens, and frequently occupies the ground on dusty roadsides.

The *Composite* family furnishes some of the most obnoxious and interesting weeds, and a considerable number. Broadly speaking, there are five chiefly introduced species that give serious trouble—namely: first, and worst of all, *Centaurea Meliteasis* and *C. solstitialis*, introduced from southern Europe, and almost universally diffused under a variety of names; second, *Anthemis Cotula*, a comparatively recent arrival; third, *Silbyum Marianum;* fourth and fifth, the two Cocklebuns, *Xanthium Canadense* and *X. spinosum*. To these may be added as of less importance, although likewise widely diffused, *Senecio vulgaris*, *Sonchus oleraceus* and *Erigeron Canadense*. All of these well-known weeds may be seen at their best in the fields and pastures of California, but little changed from their eastern or European habits, but exhibiting a resistance to heat and drought that would hardly have been looked for in plants of their native climes.

The two Centaureas, the Tocalote of the Mexicans and the Napa Thistle and Prickly Tarweed of the Americans, deserve more than a passing notice as being, with the Black Mustard and the Barley Grass (*Hordeum murinum*), the most formidable weed pest for both fields and pastures, particularly in the central and northern parts of the Coast ranges. Starting in early spring, *Centaurea Melitensis* especially will mature seeds in May; these, or any others, will germinate again, under conditions of heat and dryness that will permit no other seed to move; this second generation again runs to seed rapidly, and may, in its turn, be succeeded by a third, maturing its seed in December. The wiry tap-root, penetrating deep into the soil, requires a sharp tool to cut it. The Tocalote is thus a weed that, unlike almost any other within the state, gives the farmer no summer rest where it is once well established. In pastures it is even a worse pest than in cultivated fields, as it will take possession of the ground so soon as even a casual overstocking occurs, being able to avail itself of any chance that may occur throughout the season. It quickly and completely runs out the native grasses, and it is impossible to restore the grass without previous cultivation. For, although the plant is an annual, if cut anywhere above the root-crown it soon sprouts decumbent branches that will bloom and fruit under the very tread of cattle, and if again cut the same process will be repeated the same or the following year. The slender, sharp spines of the involucral scales (quite strong and long in the true *C. Solstitialis*) render the plant doubly obnoxious to the pedestrian when dry; while in the green state the viscous tomentum of stems and leaves soil the clothes. In grain fields it sometimes covers the ground completely after harvest, seeding it thoroughly for the coming season.

The Anthemis (Mayweed, Dog-fennel) comes next to the Tocalote as the enemy of overstocked pastures. It is not yet widely diffused, and, I think, has reached the eastern borders of San Francisco Bay only within my own recollection, about ten years ago, when I first observed it on the road from Oakland Point to Berkeley, four miles away. Within two years it reached Berkeley, and then, favored by the trade-winds from the west, it quickly ascended the Coast range and now disputes precedence with the Tocalote, up to an elevation of nearly 1,700 feet. As its vegetation is somewhat earlier than that of the Centaurea, it shades out the latter during the early part of the season; but later the Tocalote takes its turn, and between the two, the hill pastures are left in a sorry plight. The May Weed does not, however, occupy waste places in this region as generally as is the case in the cotton states; its growth is low, and as there is only one generation each season, it seems that it might readily be kept in check

on cultivated ground, which, as yet, it has not invaded to any great extent.

Silbyum Marianum (the true Milk Thistle) has, in the Bay region and elsewhere, become a common roadside weed, whose masses of handsomely veined foliage surpass in beauty many a carefully nurtured plant, but present an aspect of ragged dilapidation after the (annual) plant has completed its vegetation and sends its hairy-tufted akenes flying all over the country. Curiously enough, the Silbyum was for several years mistaken for the Canada Thistle, and the legislation regarding the latter was partly enforced against it, until the mistake was brought out in a lawsuit for neglect to comply with the law. Systematic mowing at the time of heading soon disposes of the plant, but when it has once gained possession for the season it is hard to subdue, and shades out everything else.

The true Canada Thistle was at one time imported into the state, and took possession of some land near Chico, Butte county, but was promptly recognized and subdued. Professor Greene has lately received it from Humboldt county in northwestern California.

An experimental planting of the *Carduus benedictus* in the University garden revealed such dangerous qualities as a rapidly spreading weed that it was promptly extirpated.

Of the two Xanthiums already mentioned, the *X. spinosum* especially has become ubiquitous in the state, at least from Chico to San Bernardino. Roadsides and fields are equally favored by it, and no summer drought or heat seems to affect it materially. Like the black Cocklebur, it differs from the eastern form only in a lower and more spreading habit, and both are redoubtable weeds if neglected.

University of California. *E. W. Hilgard.*

Foreign Correspondence.

London Letter.

ALTHOUGH we have scarcely had a day without rain for some weeks past, this is not an unmixed evil, for all open-air growth has been benefited by the abundant moisture, and if we are only favored with a dry and sunny autumn to ripen their wood, Rhododendrons, Azaleas and other flowering shrubs will be unusually good next year. Ornamental trees and shrubs are making extraordinary growth, which brings out their leaf-beauty to perfection, and I have rarely seen variegated and golden shrubs so fine as this year, particularly those that are liable to become scorched in hot and dry summers.

Among the new variegated trees that may perhaps have an interest for your readers is the golden variegated Ash-leaved Maple, which has now found general favor. It will, no doubt, become as popular as the now too common silver form of the same tree which defaces so many otherwise pretty gardens. The variegation of the golden sort is not so staring as that of the older variety, and, therefore, can be used more freely, without producing that spottiness which white-leaved shrubs and trees do when too plentiful. Spath's variety of *Cornus alba* is here considered the best of the variegated Dogwoods, as it is vigorous in growth, and its variegation is as good in dull and moist as in bright and hot weather. Novelties among trees and shrubs are never plentiful, and this season there seems to be fewer than usual. One of the best new shrubs I have seen is *Hypericum Moserianum*, now in full flower. It is a hybrid obtained on the Continent by crossing *H. calycinum* and *H. patulum*, the result being an exactly intermediate plant. The growth, however, most resembles that of *H. calycinum*, as it is dwarf, and the stems recurve in a similar way. The leaves, too, are similar, being obovate, pale green, with reddish bark on young stems. The flowers produced, from three to five together, at the tips of the shoots are as large as those of *H. calycinum*, but instead of being narrow are broad, and overlap, as in *H. patulum*, and are of thick texture, while the feathery tuft of stamens is not so spreading as in *H. calycinum*. The color is a very bright and clear yellow, and as the plant flowers so freely a mass of it makes a fine display. It seems to be a first-rate new shrub, and it is to be hoped that the intercrossing has not rendered it less hardy than *H. calycinum*, which naturalizes itself in all parts of these islands.

Among noteworthy trees and shrubs in flower last week none was so interesting as *Stuartia Virginica*, of which there are some grand specimens in old arboreta, like those of Syon and Coolhurst. The Syon specimen is a wide-spreading small tree planted in a dampish part of the grounds, and for the last fortnight has been crowded with its large ivory-white flowers, with crimson-topped stamens in feathery tufts. It is remarkable that, while we not unfrequently see this Stuartia in old gardens, one has a difficulty to buy it in nurseries.

A beautiful Chilian shrub, *Eucryphia pinnatifolia*, is just now in flower and is of much interest, since it has proved quite hardy and because it flowers when so little bloom is seen in the shrub garden. It is a close-growing twiggy shrub, with deep green pinnate deciduous leaves, and with flowers similar in form to those of *Hypericum calycinum*, and almost equal to them in size, but pure white. This shrub flowers freely, and for a long time. It is not, I presume, hardy enough to stand your climate. In the nurseries about London and at Kew the interesting tree received a few years ago from the Amur River, *Cladrastis* (*Maackia*) *Amurensis*, is in full flower now, and seems to improve each year. The largest tree I have seen is about ten feet high, with a spreading flat head and tabulated branches, which are now studded with erect dense racemes of white blossoms, which, from their number, are conspicuous. It is quite different in aspect from *C. lutea*, and, perhaps, will not make so handsome a tree, but any tree is welcome which flowers in August.

Of small flowering shrubs, the most remarkable are two varieties of Spiræa. One is a very dark rich crimson variety of *S. callosa* called Atro-sanguinea, which is considered one of the choicest hardy shrubs for English gardens; the other, a variety of *S. Bumalda*, known as the Knap Hill variety, and which is remarkable for its rich color as the variety of *S. callosa*.

At Kew there are just now several plants of more than ordinary interest, but the chief attraction is the gigantic-flowered *Aristolochia grandiflora*, already mentioned by Mr. Watson, the largest-flowered of all the species, and only surpassed in the size of its flowers by those of the wonderful Rafflesia. The Aristolochia is by no means new, as it was cultivated at Kew fifty years ago, and was flowered there in 1848. It was, however, lost to the collection until it was obtained, two or three years ago, from Mr. Sturtevant, of New Jersey. It is a strong-growing climber, with heart-shaped leaves. The flowers and buds so far number about three dozen, but the expanded flower lasts only a day. In its various stages of growth the flower is most remarkable, and just before it expands it reminds one of a plucked goose hung up by the neck, the front of the flower corresponding with the breast of a bird. The color before opening is a pale creamy gray, strongly marked with a prominent net-work of veins. The expanded flower measures from fourteen to seventeen inches across and between four and five feet in length, for the sepals are attenuated to a tail, which is forty-two inches in length. The plant was figured and described in Garden and Forest last year. (See vol. iii., pp. 597, 598, 599.) The inside of the flower after expansion is a jet velvety black, paling in the tube to a deep vinous purple, while the rest is a heavy net-work of purple on a greenish gray ground.

We are now in the height of the Lily season, and nowhere in England can all kinds of Lilies be seen to greater perfection than at Kew, where considerable attention is given to them, though a few years ago it was thought that they would never thrive at the Royal Gardens. Especially fine is your common Turk's-cap Lily (*L. superbum*). Here it is fully eight feet high, and with pyramidal racemes numbering from thirty to forty flowers on a stem. Being grown in large masses they make a splendid show, and last for weeks in perfection. It is far finer than *L. pardalinum*, better suited to our climate, and is hardy beyond

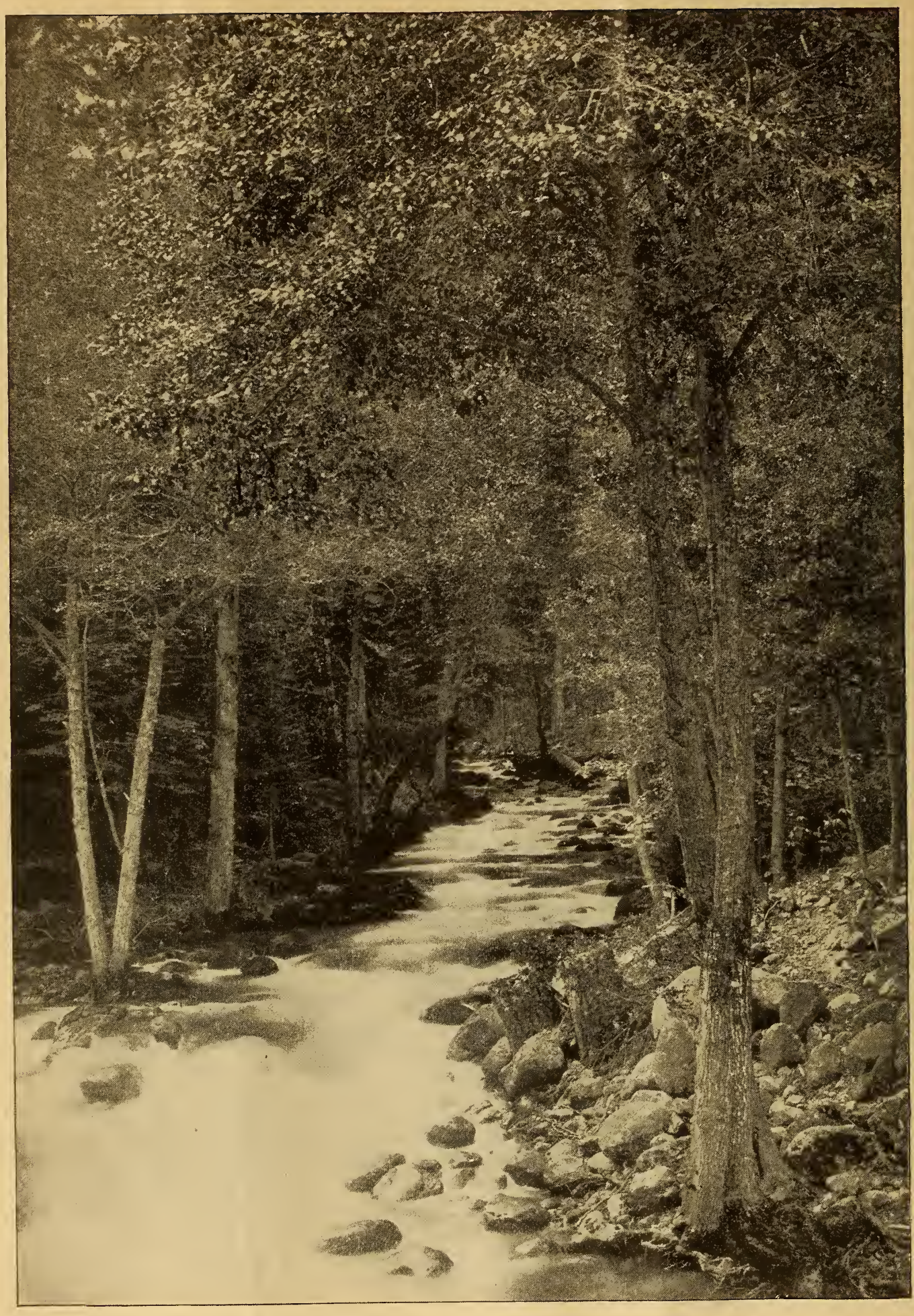

Fig. 68.—A Stream in the Yosemite Valley, bordered with Alders.—See page 422.

a doubt. Another grand Lily now in flower is *L. longiflorum Takesima*, the most dwarf of all the varieties, and better and more certain than the Bermuda Lily. It grows about eighteen inches high, and carries on the strongest stems as many as six flowers. It is also grown in peat in beds mixed with Kalmias and Heaths. It is one of the finest plants we have for the greenhouse as well as the open border. Rarer Lilies in flower are *L. Henryi*, a new species from west China, which has the habit of growth of *L. speciosum*, and with flowers of similar shape and size, but a pale orange-yellow like *L. Leichtlini*, a very choice Lily, also in bloom now. Probably *L. Henryi* will develop into a fine garden Lily, for one cannot judge of a new plant the first season. Another new Lily is *L. chloraster*, which Mr. W. Baker first regarded as a variety of *L. longiflorum*, but which he now considers as good a species as *L. Brownii*. It is not unlike this last, except that on the outside it lacks the claret-colored stainings. Inside it is a pale green; hence the name given to it. *L. Formosanum*, also a variety of *L. longiflorum*, has an interest for the Lily specialist, but in no way rivals the older and commoner varieties.

Among other bulbous plants in flower at Kew is a white variety of *Crinum Moorei*, itself one of the loveliest of greenhouse plants, but the white form of it is even more beautiful, the great open flowers being spotless white and delicately perfumed. *C. Moorei* flowers more or less continuously throughout the summer, and grows into a noble plant with massive foliage and with stems four or five feet high.

A beautiful species of Gladiolus in flower now is *G. decoratus*, as it was named a few years ago by Mr. Baker when received from south Africa. It is a slender plant with medium-sized flowers, forming a loose spike. The petals are a bright scarlet, the three lower ones being adorned with large blotches of clear chrome-yellow, making a striking contrast of color. It will, doubtless, be of value to the hybridist, who seizes upon everything to create new combinations of color.

London. *W. Goldring.*

Cultural Department.

Apples in Maine.

IT is stated that of the forty-seven varieties of apples starred by the American Pomological Society for Maine, only seventeen varieties are double-starred, "to indicate great superiority in that state.' But double-starring indicates only great commercial value; quality being indicated in the Society's lists by letters—g., v. g. and b., for "good," "very good" and "best." This does not seem to be so well understood as it should be. When we come to examine the lists of the Society, however, we at once see that comparatively few of the very good and best sorts are double-starred; while many sorts of inferor quality, such as Ben Davis and Oldenburgh, receive double stars on account of their commercial value only. As Maine is too far north to grow some varieties much valued in southern New England and the middle states, it is quite easy to see why her double-starred list is not so large as it otherwise might be.

In this connection it is important to understand that the rating of fruits on the American Society's lists is dependent wholly upon the opinions of those fruit-growers who are members of the Society, and attend and take part in its meetings. No one else has any authority to modify the starring or lettering, and it thus often happens that the larger portion of a state is quite unrepresented as to the relative values of its fruits. It is entirely safe to say that, as to the quality and commercial value of the fruits of Maine, their status represents the opinions of fruit-growers south of forty-five degrees, although quite three-fourths of the state is north of that parallel. The same fact also applies to New Hampshire and Vermont.

It is worth noting which are the double-starred Apples of Maine. They are: Early Harvest, Fameuse, Gravenstein, Hubbardston, Jewett's Red, Minister, Mother, Northern Spy, Oldenburgh, Porter, Red Astrachan, Red Canada, Rhode Island Greening, Sops of Wine, Tetofsky, Tompkins' King and Williams. Of these only five, namely, Fameuse, Oldenburgh, Red Astrachan, Sops of Wine and Tetofsky can be profitably grown north of the latitude of Bangor. The Baldwin is not on this list, although it is the most extensively grown and most profitable apple of south-eastern Maine. Its profitable area, however, is limited to parts of five or six counties only.

It is understood that the Maine Pomological Society will recommend, at the Washington meeting of the American Pomological Society, two stars for the Milding, Rolfe and Stark, and one star for Boardman, Dudley's Winter, Gloria Mundi, Golden Sweet and Munson Sweet. But, very singularly, the Wealthy, which is quite extensively planted in Maine, and is very successful over nearly the whole state, gets no mention, and the same has to be said of Yellow Transparent and Scott's Winter, which have proved successful over a large part of the state. Of Dudley's Winter (which has been lately renamed North Star) only the original seedling tree is yet in bearing; and although a promising sort (a seedling of Oldenburgh) it is hardly yet in a position to receive any rating by so conservative a society as the American Pomological.

It is quite evident that middle and northern Maine cannot have any very effective representation in the state society, and that this matter of rating is entirely in the hands of persons who, however well informed in the older pomology, are not so well instructed in the newer, albeit the latter is of very great importance to the larger part of that large and productive state. Northern Maine has nothing but its severe winter climate to prevent it from equaling western New York as an orchard region. Its deep and rich limestone soil, and its gently rolling surface, eminently fit it for orchard culture of a high type; and the recent introduction to our continent of the very distinct races of tree-fruits from eastern Europe, as well as the production at home of several of that class of apples known as the Iron-clads, opens up a great future for such localities.

It has been so often repeated, and is so widely believed, that these newer fruits are of very slight importance in American pomology, that a more than usual insistence upon, and repetition of, ascertained facts in regard to them is necessary. The efforts of Professor Budd, of the Iowa Agricultural College, in collecting and testing foreign tree-fruits of great hardiness in the extensive grounds of that institution, are, as yet, hardly estimated at their true value and importance. From my own careful observation and experience I am convinced that it is but a question of time, and not of very long time, when we shall have collected and selected from these fruits a full list of apples, pears, plums and cherries as well adapted to our colder states as the present standard varieties are to the middle states.

But we are not shut up to these. We are, by selection and the growth of seedlings, rapidly adding to the number of sufficiently hardy native varieties, at least of apples. Our wild native fruits, quite as promising as the originals of other continents, are being developed by selection and culture, so that it is fair to anticipate as successful a future for native apples, cherries and plums as we already see in our native grapes. I submit that it is a worthy and noble work, in which the workers are entitled to respect and encouragement from every well-wisher to his country.

Newport, Vt. *T. H. Hoskins.*

Sweet Peas.

REV. W. T. HUTCHINS, who has made a specialty of these plants, has written an instructive essay about them for the *Tolland County* (Connecticut) *Leader*, from which we extract the following by permission:

"There is some uncertainty as to how many so-called varieties really deserve the name; but they may be divided into three classes: The first class includes those with the form of the old-fashioned Sweet Pea. There are about thirty named varieties of these, and cultivation is putting new blood into them, so that they are now conspicuous for beauty of color and size. These principally take their variety name from the color or markings of the standard, that is, the single erect petal which rises back of the wings. To this class belong the new Blanche Ferry, which is a great improvement on the old Painted Lady, and has a brilliant rose-pink standard and white wings; Scarlet Invincible, a dazzling scarlet, both in standard and wings; Invincible Carmine and Cardinal, both but slight variations from the Scarlet; Vesuvius, blue and violet, shading into white and dotted, with crimson spots; Duchess of Edinburgh, an orange-scarlet standard, margined with white; Primrose, with a suggestion of buff yellow; Orange Prince, the finest of

this class; the Black and the White, two familiar sorts, but now cultivated to a remarkable size; Salmon or Flesh color; Crown Princess of Prussia, a delicate blush; Captain Clarke, of which the newer strain deserves to be called Columbia, because it is red, white and blue; Scarlet Striped, now improved into Queen of the Isles, a magnificent flower; Adonis, a uniform pink; Boreatton, the finest of all the darker kinds, a deep velvety maroon, both standard and wings; Purple and Brown, and Blue and Purple, and both of these beautifully marked with stripes; Violet Queen and Princess Louise, shades of violet; the Queen, lighter shades of mauve and violet; Fairy Queen, white, delicately lined with crimson; Isa Eckford, a beautiful blush; Delight, suffused with crimson; Blushing Bride, an improvement on Blanche Ferry; Purple Prince and many more.

"The second class is distinguished by flowers of a newer form, and in some of the larger ones the fullness of size produces a wavy look. Among these are Apple-blossom, a beautiful rose and white; Splendor, a deep rose color, half of the stems bearing four blossoms each; Indigo King; Grand Blue; Imperial Blue or Mauve Queen; Butterfly, shaded blue and white, and sometimes blue-edged; Princess Beatrice, a fine rose-pink; Senator, chocolate and white stripes; Princess of Wales, blue and white stripes; Countess of Radnor, very choice, a soft lavender, shading into mauve; Monarch, Miss Hunt, Mrs. Gladstone, Mrs. Sankey, Princess Victoria, Queen of England and Empress of India.

"The third class includes the new hybrids, some of which are promising, and others simply show their shifting nature. By the way, there seems no reason why the production of new varieties by hybridizing cannot be accomplished as well in this country as in England. The odd little blue Pea, Lord Anson, deserves mention here. In a mixed row it has a decided value, though it is not properly a Sweet Pea, and has nothing but its bright azure color to commend it. The red and white perennial Peas, bearing their showy blossoms in clusters, are also well worth growing.

"For cultivating Sweet Peas there are six simple requisites, but they are inexorable. Of course, such general rules as rich ground, sunny exposure and thorough weeding are understood. The special requirements are: (1) early planting; (2) deep planting; (3) extra fertilizing; (4) strong bushing; (5) watering; (6) free picking, which means keeping the pods off. Planting early means as soon as the ground can be worked. Sweet Peas are very hardy, and, like the earliest garden Peas, need to make their root-growth in the cool, moist spring ground. Frosts need not be feared. Sometimes they are planted in the fall. Deep planting is very important to guard against the drought of midsummer. They should be planted five inches deep, but to cover them with five inches of cold, wet March soil almost insures failure. Hence they should be sown in a trench or furrow at the right depth, and covered but one inch at first. As they grow the earth is filled in, until when leveled they are at the right depth. They should be sown in a double row about ten inches apart, and the seeds dropped an inch and a half apart in the furrows.

"By extra fertilizing is meant the application of such stimulants as wood-ashes, bone-flour and nitrate of soda. The garden should be well manured in the fall to give the soil a good body of vegetable matter; but to get a quick growth of thrifty vines and early flowering the above-named plant-foods are excellent. Scatter the wood-ashes on in the winter; hoe in the bone-flour just before bushing; and, in May, scatter along, just outside the rows, a handful of nitrate of soda for every four feet, stirring it in, but not allowing it to come into immediate contact with the vines. They will then grow a foot a week in June, and one can look for blossoms a month ahead of the man who believes in the 'good old way.' This kind of cultivation necessitates strong and tall bushing. Get the best Birch tops, at least seven feet high, and, if two inches thick, all the better, and set them firmly in the ground with a crowbar. Bush between the double row, and train the vines to the bushes if they rebel. Where bushes cannot be obtained resort must be had to a trellis of poultry wire or a frame, with horizontal wires or strings, taking great care to secure strength and height. It is a calamity to have a thrifty row lop over or blow over in the height of the season.

"An ample supply of water is always needed, and in a dry season it must not be neglected. A rainy summer is friendly to Sweet Peas, and gives us about as good conditions as they have in the moist climate of England where they flourish. Pick the blossoms every day; sacrifice the pods if you want flowers from June till October. You cannot have blossoms and save your own seed; if you did save it from a mixed row it is very sure to be unsatisfactory."

Begonias.

Begonia metallica variegata.—*B. metallica* seems to have sported in several different places lately, as often happens with plants after being under cultivation. One of our prominent horticulturists has a theory that many plants resent high culture and artificial conditions of growth, seeking to escape them by either a disguise in the way of change of foliage, or by putting forth flowers of other colors. This, of course, credits the plant with the ability to reason in this way: "as my present dress is attractive, if it is changed perhaps my persecutor may neglect me." The theory is a pretty one, and, true or not, it is certainly of frequent occurrence, that after a plant has been cultivated for some time—it may be months or years—the whole stock, though in widely separated places, shows a tendency to sport. Roses are frequently observed to give a same or similar sport in a number of places during the same season. Chrysanthemums seldom give a noticeable sport, but as soon as one appears others of the same character are quickly reported in other places. Now, the plant of *B. metallica variegata*, which has been in my possession several months, originated near here, and the variegation seems constant. I observe that the same variety is being offered in England. The marking of my plant is white and pink, in blotches, the young foliage being mostly light. The plant seems a fair grower, though I cannot, without further experience, say that it is as vigorous as the thrifty type so well known as a fine foliage plant of rapid growth.

Cyprea and Velutina are two seedlings of *B. metallica* which do not seem to me an improvement on the type, they lacking the dark veinings which are so effective in the parent.

Souvenir de F. Gaulin is a new hybrid, said to be a cross between *B. olbia* and *B. rubra*. It has attractive, thin, satiny leaves of olive-green and large racemes of large coral flowers, and is a very fine plant and an acquisition.

Bertha McGregor is one of Mr. E. G. Hill's seedlings between the Rex and flowering sections, and is of the class of which Clementina is probably the best-known variety. The new plant has large-pointed, finely notched leaves, and is a good grower. The centre of the leaf is small, of a rich deep maroon, the body silver outlined with bronze. It is a beautiful variety in every respect. It is not surprising that so many new Begonias are offered, for they are a wonderfully sportive family, as is well known to every one who grows a number of them. Seedlings of new forms are continually springing up in the pots or on the benches of the greenhouse. Some kinds, like *B. Schmidtii* and *B. semperflorens*, may always be found in neglected corners, but usually these two come quite true.

Begonia Sunderbuchii is not a new species, but should be better known. It has smooth leaves, deeply cut in the way of *B. ricinifolia*, but smaller; these are green, with a brownish cast and with light veins, though this description gives an inadequate idea of the dainty coloring. It bears large panicles of light pink flowers in winter. It is not as massive or tropical as *B. ricinifolia*, but the effect, when in bloom, seems to me as satisfactory as that of any variety of the family. The charming flowers surmount foliage which is beautiful in coloring, but somewhat stiff and unbalanced, producing what may, for lack of a better name, be considered a Japanesque effect.

Begonia Semperflorens atropurpurea, or *B. Nelsoni*, is a French variety of the old Semperflorens, with purplish markings of the leaves. The markings have not proved constant with me, and I am inclined to doubt if they will prove so under our hot sun. A Begonia with colored foliage would be a gain for a bedding plant, and I am inclined, from indications, to think it may yet come in the tuberous section. For a good bedding Begonia it is doubtful if any surpasses old *B. Evansiana*, which is handsome in leaf and flower, and will survive the hottest sun. It needs little room or care in winter, and, in fact, the bulblets are hardy and will germinate in the spring in the borders where the old plants have grown.

Begonia Scharffiana.—The unsatisfactory opening of the petals of this variety, reported by Mr. Hatfield, is evidently owing to some fault of culture. One of my plants now in flower opens its blooms satisfactorily, though a very large plant in the winter could not be induced to spread its petals.

This Begonia is very distinct and very attractive, especially in a young stage, but it has a trick of partially dying off and resting, which vagaries will prevent its becoming a popular plant.

Elizabeth, N. J. *J. N. Gerard.*

Correspondence.

Nature's Nurseries.

To the Editor of Garden and Forest:

Sir,—In these days when, fortunately, the need for preserving our forests is proclaimed on every hand, and when even those who do not think of this need are pretty sure to find a wooded country beautiful and to rejoice in the presence of forests near their homes, it is interesting to hear the opinion of an occasional "survival" of a day when a very different state of mind was prevalent. It is interesting, because such an opinion strikes us as singular and reprehensible, and thus it is proved that "public sentiment" has changed, even if it has not yet conspicuously expressed itself in a practical way. The "survival" whom I have now in mind is a survival indeed—an old country-woman living near the shores of Buzzard's Bay who claims to have seen 107 years, and who is proved by the town records to have seen 103. To visit her one leaves the highway and follows a rough farm-track, first through a couple of fields, and then for more than half a mile through a dense wood composed in greater part of White Pines. Her cottage stands in what looks like a western "clearing," three or four acres in extent, and surrounded on all sides by the forest. One day when we were remarking on the quiet charm of the spot, she protested that it was much prettier years ago, when there were no trees in sight. "When was this?" I asked. "Well," said the ancient dame, "I took care of Johnny Stuart's mother when he was born, and he's about thirty years old. And I reck'lect that as I was coming home the last of the old woods had been cut down, and the timber lay there all nicely corded up. My! it looked lovely; no woods just as far as you could see!" And then, when we remarked that we admired the woods, she said: "Well, you haven't had too much of them. We had. We got tired of looking at them, and liked to see them go." And this, in truth, was a not unnatural state of mind in those who had to make their living out of the land, and had had small chance to cultivate feeling for beauty devoid of a utilitarian flavor.

If old Aunt Keziah's memory is not at fault, and Johnny Stuart is indeed about thirty years of age to-day, the tract to which she referred cannot have been long under cultivation. Indeed, it would seem, from the size of the trees, as though it must have been allowed at once to grow up in forest again, were it not for the character of the present wood. Neither here, nor in any of the adjacent parts of Plymouth County, so largely covered with forests of Pine, Oak, Swamp Maple and Birch, does one often see those ancient stumps from which tall, thin, sapling-like trees have sprung, which in other districts show that the land was never cleared for the plow. All our miles and miles of forest, so far as I have walked and driven through them, are devoid of stumps, and composed of trees that have evidently grown from seed. Some of them, notably those tracts exclusively covered with Pines, have evidently been planted; but in this immediate vicinity they have chiefly covered themselves, and have once been cultivated meadows and farms; and here and there, even at considerable distances from the highways, one comes in their densest shadow upon lines of ruined stone walls, upon ancient Apple-trees and the foundations of former homes. In one way the sight sometimes affects one sadly; but the forests themselves, though they contain few large trees, are extremely pretty—far more charming than those which have immediately sprung up again on land never thoroughly cleared. Lacking near standards of comparison, one soon forgets that trees grow larger than these, and notices only their varied spontaneous grouping, and, on the outskirts of the woods, their beautiful development. And those who like to study the methods of Nature may find ample and varied fields for observation. Here we can see, better than in any other district I know, how eager Nature is to grow trees whenever she gets a chance. For instance, next this cottage, which stands by the highway, is a wide meadow, where horses and cattle are pastured, covered with close grass, and quite unbroken by even the smallest sapling. The next field, divided off by merely a slender wire fence, was probably devoted to the same use, or perhaps to some crop, until ten or twelve years ago, but since then has been left untouched. And here is a mass of little trees growing as one might think trees never could grow, of many varieties, but all practically of a size, packed densely together, and pressing so closely to the slight fence that it seems as though it must soon give way, and then the pasture would be covered not by seedlings, but by regiments of young trees from this baby forest, eagerly rushing out for a little wider foothold and a little more air and sun. It is impossible, looking at the edge of such a young wood, not to fancy its trees are sentient beings, panting and stretching to relieve themselves from their crowding neighbors, and able to do so if the fence were gone.

A little further on we may come to an older piece of wood where the struggle for life has thinned the ranks of the trees, and where they have attained a considerable size, leaving space between them for an undergrowth of shrubs and vines. Again, if we follow some wood-path—the remains very likely of an old wagon-road—we shall come upon a plantation of White Pines, perhaps fifteen or twenty years old, where the lower branches are all dead but have not yet dropped off, where we see into, but cannot walk through, a ghostly-looking thick maze of brown twigs, and the shade is so dense that no undergrowth can live on the carpet of brown needles. A little further and the Pines are bigger, the lower branches have fallen, and the spot is a great solemn grove, its brown carpet sparsely dotted with a few straggling Brambles or Huckleberry-shoots. But I think the most charming places of all are those where a meadow is in process of capture by a surrounding forest, which is sending out colonies of seedlings from its borders. Here we shall have a central area of grass sometimes entirely free from trees, encircled by conical young White Pines from four to ten feet tall, and feathered to the very ground—masses of delicate light green needles, smooth and solid in outline but deliciously soft in texture. Back of these will be the taller masses of the forest growing on fields earlier abandoned, while in front of them, if we look closely, the ground will be found covered with baby trees, tiny Pines born last year or this year only. And if we come again in ten years the whole field will be covered with seedlings, and the conical soft green pyramids of to-day will be losing their lower limbs and assuming the habit of maturity. I remember one Pitch Pine, standing in the centre of a meadow surrounded with White Pines, beneath which three years ago nothing grew but grass. Now, as the encircling trees have sent out their flights of seeds, its branches shelter a thick expanse of tiny White Pines, from an inch to six inches in height. Those who try to grow Pines sometimes say it is not easy; but Nature seems to do the work without any trouble at all in this vicinity. Indeed, after living here half a dozen summers, one begins to feel that ere long we shall all be crowded into the bay by the trees; and so perhaps in time we too shall come to the state of mind expressed by old Aunt Keziah's words. Meanwhile, however, if any one wants to see how trees grow of themselves, and so to divine something of those processes which built up the "primeval forest," he can find no better place than this. Exhaustion of the soil is usually given as the reason why these districts have so largely been abandoned by the farmer, but Aunt Keziah lays all the blame on the eagerness of the young folks to journey cityward. And though we know at least the partial truth of the other explanation, we are tempted to believe her, for a soil does not seem exhausted which can produce woods so easily as this. A little further eastward, when one gets really on Cape Cod, one clearly reads poverty of soil in the disappearance of many of our most common trees and the almost universal sovereignty of the Pitch Pine. But along this eastern shore of the great bay there are more White Pines than Pitch Pines, and, in addition to the other trees I have named, shrubs and vines of many sorts grow by the way-side and along the woodland edges with marvelous luxuriance. For man's crops the soil may be as poor as you will; for Nature's most beautiful crops it seems, to the eye of the uninitiated at least, a very good soil indeed. It may be that wise men would say that, however long our woods remain undisturbed, there will never be arboreal giants in the land; but it grows very beautiful trees of a smaller size to-day.

Marion, Mass. *M. G. V. R.*

Periodical Literature.

A Ride Through the Caucasian Mountains.—II.

After leaving this forest the road descends to the river, which for want of a bridge must be forded, and then crosses a wide stretch of once cultivated country. Only a few years ago this region supported a large population, but, finding Russian rule insupportable, its inhabitants sought a new home in Turkey, too often finding instead only worse suffering and a speedy death. It will not be many decades, says Dr. Dieck, before all traces of former cultivation will be overgrown, and then there will be a fine chance for some exploring botanist to surprise the world with sensational accounts of plants which are indigenous to the region or have been introduced by natural means, for already garden-plants are beginning to dominate in the wild-growing vegetation. Hazel and fruit-trees,

various kinds of the Alutscha Plum, Walnuts, Medlars and Weeping Willows, and even such American trees as the Catalpa and the Locust (which a former apiarist brought from Suchum) occasionally appear. Wild Roses of many sorts grow rankly with *Crætegus heterophylla*, *C. melanocarpa* and *C. oxyacantha*, and a wilderness of Brambles, yielding their products only to the wild sows and bears which have marvelously multiplied in these depopulated valleys.

Soon after leaving this meadow-valley, the road, which becomes so bad that riders must dismount to advance with safety, reaches a forest of Beech-trees "whose beauty and majesty defy description." This Beech-forest has returned to the condition of a primeval wood. From time to time the path is barred by fallen trunks, so large that one can neither climb them nor see over them, and a long detour must be made to resume the journey, while other fallen giants form archways underneath which the traveler must creep. Only after the most trying efforts on the part of man and beast did Dr. Dieck's party eventually reach the top of a mountain range, and, at about 4,500 feet above the sea-level, the subalpine region characterized by *Gentiana auriculata*, *Swertia*, *Trifolium polyphyllum*, Mulgedium and *Campanula lactifolia*, but especially by the charming dark yellow *Crocus Scharojani* (*Suwaroffianus*), which was just beginning to bloom. In one place the beautiful *Rhamnus grandiflora* (*imeretina*), of European gardens, appeared in quantities, reaching a height of twelve feet—a plant which the author regards as distinct, although Herr Dippel now considers it merely a form of *R. alpina*. Lunch was eaten in a picturesque ravine (this was the second day of the journey) in the vicinity of Cherry Laurels and Rhododendrons, the wood of which was used to boil the travelers' tea. From the top of a rocky wall nodded the flowers of *Vaccinium Arctostaphylos*, which was seldom met with in this region, but was found later in Pontus in incredible quantities, bearing refreshing fruit.

After another difficult hour in the Beech-forest the wood gradually gave place to an alpine undergrowth. Instead of *Rhododendron Ponticum* appeared *R. Caucasicum*, and, instead of the Beeches, scattered specimens of *Pyrus Aucuparia* in a gray-green form, *Pyrus Aria* and *Acer Trautvetteri*, which resembles *A. Pseudo-Platanus* so closely that the two might easily be confused. In thickets of *Rhododendron flavum* (*Azalea Pontica*) there grows a form of *Salix caprea* which, in the color of its branchlets and the shape of its leaves, is so much like the Rhododendron that one must look carefully to distinguish the two, especially as here they grow to the same height. "I believe," says Dr. Dieck, "that this is a very interesting case of 'mimicry,' which I explain by the fact that animals avoid the leaves of the Azalea, while they relish those of the Willow. A natural effect of this fact is that the large Willows which most nearly resemble the Azalea more easily arrive at the production of flowers and fruit, and thus the Azalea-like form becomes more and more widespread. Between the stones of the mountain-comb and on the shady side of the occasional elevations and rock-points grow *Salix arbuscula* and *S. Silesiaca*, *Daphne glomerata* and a beautiful dwarf Rose which was still in bloom."

Almost exhausted, the travelers found rest the second night of their journey on the shore of a miserable little pond of snow-water called by the high-sounding name of Lake Lachda. The view from this plateau, at an elevation of 7,000 feet, is majestic, showing in front, over a deep valley, the snow-mountains of the main Caucasian range, on the slopes of which were seen, for the first time, dark masses of coniferous trees. But both Dr. Dieck and his guide felt unequal to the further effort required to reach this range, and, after a cold night passed on the bare ground, returned to Amtkjel by another path still more difficult than the one they had traversed—so difficult that they were in constant fear of accident and actually lost one of their beasts of burden by a misstep. They were glad, too, of the protection against thieves insured by their meeting with a former acquaintance, a chief of police. But, says Dr. Dieck, in conclusion, "the wonderfully luxuriant vegetation, and the grandiose panorama of the primeval forest which again offered themselves to our astonished eyes, helped us through the pains and troubles of this return journey."

The August issue of the Bulletin of Miscellaneous Information from the Royal Gardens at Kew contains a statement of the position of Kew with regard to the naming of Orchids. During the middle of the present century Dr. Lindley was recognized everywhere as the authority upon these plants, and all questions relating to their determination were entrusted to him. On his death the Orchid mantle fell on the shoulders of the late Dr. H. G. Reichenbach, who was more familiar with the family than any of his contemporaries, and to whom all scientific questions relating to it were referred. The defect of his method was that he did not bring the scattered work of his life into anything like one comprehensive study. He had the clue to it himself, but when failing health came in the latter years of his life he was overwhelmed with the enormous amount of material which he had accumulated, and now it is found that he often described the same species more than once under independent names. The difficulty which this state of things would have produced would, in any case, have been considerable. It has been enormously increased by the fact that after his death in 1889 he left his collections to the Imperial Hof Museum at Vienna on the condition that they should be sealed up for twenty-five years. Reichenbach was no longer available to furnish names to the cultivators of Orchids, and his herbarium was not accessible to ascertain what he had done in the past. Something had to be done, and the amateurs of Orchids naturally turned to Kew for help. Kew was not badly equipped for the task. It possessed Lindley's collections, the classical starting-point of systematic orchidology. Mr. Bentham had devoted two years at Kew to the elaboration of the family for the *Genera Plantarum*, and in doing this had sorted the material at Kew into genera, which he clearly defined. Reichenbach, too, had for years passed several weeks of every summer at Kew working on the collections there, which he enriched with valuable notes; and Hooker had worked up in the same herbarium the Indian Orchids, amounting to nearly thirteen hundred species, for the "Flora of British India." Kew, too, possesses a collection of fourteen hundred species of living Orchids out of a total of about five thousand existing species.

Our correspondent, Mr. Rolfe, has been placed in charge of the Orchid department of the herbarium, and will now publish in the Bulletin descriptions of new garden species, ten of these appearing in this issue. Kew is in a better position to serve as the last resort in Orchid nomenclature than any other botanical establishment. Certainly there is none in this country properly equipped to deal with such subjects, and American cultivators of Orchids in doubt about the names of their plants will be forced to communicate with Mr. Rolfe if they desire the most authoritative determinations. There is, however, always the risk that when an unnamed Orchid cannot be determined in the Kew herbarium that it may not really be undescribed, but may be in Reichenbach's collections and already furnished with a name. These are questions which cannot be settled for another quarter of a century. For practical purposes it has therefore been decided at Kew to assume that any such Orchid is new, and to describe it with an appropriate name. "It must be the aim of every botanist to avoid the multiplication of names and the piling up of synonyms. But the world cannot wait on posterity, and some one, a quarter of a century hence, may have the patience to disinter from Reichenbach's herbarium, if it is thought worth while, any names which have the prescription of priority."

The subject of "Country Roads and Highways" is taken up in *Lippincott's Magazine* for September by Mr. John Gilmer Speed. He well says, "It would be a waste of space to attempt to prove that our common country roads are, as a very general thing, as bad as they can be; they are so generally bad, indeed, that I have met native-born Americans, who had never traveled abroad, who could not be brought to believe that good roads were possible." And his words are equally true when he adds that common roads are "at once the means and the measure of civilization," that we have for long been paying a very heavy penalty for the neglect of our highways in a tax upon agriculture, so great that "the farmers are getting behind more and more every year, and are generally dissatisfied," and that "very few of them know what is the chief cause of their lack of prosperity, for they have never had good roads, nor did their fathers and grandfathers." Mr. Speed then recounts the measures which have been taken or proposed in various states for the amelioration of the roads, and then, to show the extreme need of legislation, describes the roads in the New Jersey township in which he has his own country home, and which is one of the very few in that state untraversed by any railroad. The roads were laid out about a hundred and fifty years ago, probably following the "hap-hazard paths and trails which ran through the woods before any clearings were made. From the township village to the county town the distance is about seven miles, and the difference in elevation about two hundred and fifty feet. There is a valley running all the way between the two places. Had the highway been located in this valley the distance between the points would have been less than it is, and there

would not have been a heavy grade on the whole route. Instead of this the highway has been placed variously over the hills, on the hill-sides and in the valley, so that whichever way one goes it is always up or down hill. All the produce not consumed in the township has, during a century and a half, been hauled over this dreadful road. The tax that this unskillfully constructed road has entailed upon the several generations that have lived in the township has, of course, been enormous. And the roads are not merely badly laid out; they are wretchedly built and maintained. Yet the people have always had at hand the best kind of material to make good roads, for the surface of the fields is covered with stones which need only a little breaking up to be just what is needed. And then there is limestone in abundance all about, and gravel too. For many years past the township has levied a tax of $1,600 each year for repair of the roads. Only about one-third of this amount is paid in money. The rest is paid in labor, and that, too, at the rate of one dollar and a half per day, when the prevailing rate of pay for much harder work is only one dollar and a quarter per day. When the farmers have finished their spring plowing and planting they go out on a kind of picnic frolic on the road. They plow up all the grass along the sides of the road and put the sods and muck from the ditches into the centre of the road, and very carefully throw all the small stones up against the fences on either side. I need not tell what the consequence of this is. When the weather is wet the roads are six inches deep with a heavy and adhesive mud; when the weather is dry, as it is apt to be in summer, the roads are fetlock deep in dust. What should go on the roads, so as to make them hard, is left lying loosely in the fields; and what, if put upon the fields, would make them rich and fruitful is put in the roads to hinder traffic." This last epigrammatic, but most veracious, sentence might well be printed as a warning and posted up in most of our village neighborhoods, for, as Mr. Speed explains, "I have described the system of my own township, because I am sure the same system prevails in many other localities." Then he adds: "In the whole township there is not a rich man, and there are not more than two or three who are moderately prosperous. Nearly every farm is mortgaged, very many up to their full value, while each recurring census shows that the population is getting smaller. And this is only thirty miles from New York, and in a section for which Nature has done the most liberal things. . . . The farmers say that their lack of prosperity is due to an absence of railroad facilities. I am sure that if they had ever had good highways, or had even spent with any kind of wisdom and judgment the money each year levied for roads on the highways as they exist, they would not have felt the want of railways as they do." Truly, in the words which Mr. Speed quotes from Professor Shaler, "if we take the misapplied expenses of our country ways, and if we count at the same time the mere social disadvantages which they bring to the people, it is probable that the sum of the road-tax is greater than that of our ordinary taxation."

Exhibitions.

The Massachusetts Horticultural Society.

COPIOUS rains and abundant heat have made the gardens of Massachusetts flourish this year, and perhaps a better show of their floral products was never made than that which filled the two halls of the Massachusetts Horticultural Society last week in Boston. The fact that only space for plants and flowers could be found, the annual exhibition of fruits and vegetables being postponed until a fortnight later for want of room, shows that the season has been a good one, and that the taste for gardening is increasing in the Bay State. There have been better rich men's flower-shows in Boston, perhaps, with more large specimens of tropical stove-plants and Orchids, but there has never been a better all-round exhibition of flowers, or one in which collections of the popular flowers of the masses have been seen in such profusion and of such high quality—a fact which may be taken, perhaps, as a hopeful sign of the broadening tendency of our horticulture.

A number of excellent collections of greenhouse plants were shown, it is true, and each contained a large number of well-selected and well-grown clean and healthy young plants, much better adapted to the purposes of decoration, for which these plants are often so well suited, than the enormous specimens often found in prize groups in American and European flower-shows. Orchids, it is true, did not appear in great profusion or in great variety, and none of the famous collections were represented; but even Orchids are not missed from such an exhibition as the people of Boston had the opportunity of witnessing last week.

Special features were large, well-selected and well-arranged collections of the flowers of hardy herbaceous plants from J. W. Manning and Temple & Beard, who now pay much attention to the cultivation of plants of this class, which are every year increasing in popularity. The same firms, and W. C. Strong, staged large collections of coniferous plants in pots in competition for the Hunnewell prizes, the first prize being awarded to Temple & Beard.

China Asters appeared in force in competition for the special prizes offered by Parker, Wood & Co. Joseph H. White took the first of these prizes, and R. T. Lombard the second, for the best collections of large flowering Asters, one hundred vases, with three flowers in each vase. Japanese Lilies were shown in profusion and of remarkable quality and in great varieties of color. The first prize for these flowers was given to T. C. Thurlow, and the second to William K. Vanderbilt, of Newport, who also received the society's prize for fifty vases of large-flowered China Asters. Prizes offered for Dahlias by J. C. Vaughan, of Chicago, brought out several good collections of fifty vases with not less than twenty varieties, the first prize being secured by W. C. Winter, who also obtained the prize for Lilliputian Dahlias. There was a good show of the new French flowering Cannas, of Nasturtiums, and of the other leading garden-flowers of the early autumn.

The collections of wild flowers of eastern Massachusetts, which are almost always an important feature of the Boston shows, were not wanting, and delighted the lovers of nature as much as the showier inhabitants of gardens.

The feature, however, which most took the popular fancy was the exhibition of aquatic plants and flowers which filled two large tanks in the upper hall, and which had been sent up from Mr. Simpkins' garden at Yarmouth, where the cultivation of these plants is a specialty and where they are more successfully grown than anywhere else in the United States. Crowds of people, filled with admiration for the strange and beautiful flowers, surrounded the tanks from morning until night, and it is doubtful if a more successful or more attractive exhibit was ever made at any flower-show. One tank contained a leaf of the *Victoria Regia* about six feet across and bearing a vase containing one of its great flowers, and the other a collection of the following Nymphæas arranged with their leaves: *N. Marliacea chromatella*, an interesting hybrid with delicate lemon-colored flowers; *N. rubra*, *N. gigantea*, *N. dentata*, *N. odorata rosea*, and the Japanese Nelumbium, with a few smaller aquatic plants.

A number of mantel-piece decorations were set up in competition for the prizes offered by the Gardeners' and Florists' Club of Boston. The first prize was awarded to Bowditch & Long, florists, and the second to Mrs. E. M. Gild, of Medford. The arrangement which was considered the best was composed of a great mass of Orchids, Ferns, Lilies, Lapagerias and Palms, which entirely covered not only the shelf above the fire-opening, but the fire-opening itself and the whole wall-area about the shelf. It appeared to us that this arrangement, as well as those of the other competitors, lacked simplicity, and showed a too evident desire to use as much material as possible, without regard to harmony either of color or form. The flowers used in the first-prize decoration represented, no doubt, a larger money-value than those employed by any of the other competitors, but it is doubtful if it could be considered to have represented as much taste in arrangement as one or two of the others. They were all, however, overdone. A fire-place is made to build a fire in; if it is not to be used for that purpose, it has no reason for existing. A vase of flowers is an appropriate decoration for a mantel-shelf, or a single spray of some graceful vine may be allowed to break its formal lines; but any decoration which covers up the entire side of a room at the spot where it is intended to build a fire appears to be excessive, and therefore to be bad art, just as the decoration which loads a dinner-table with masses of heterogeneous flowers, or which finds its expression in the grouping together of innumerable varieties of plants in gardens without reference to their fitness for association or without regard to their surroundings, is bad art.

Mr. George A. Nickerson, of Dedham, took the first prize for six greenhouse and stove plants, his collection containing some remarkably well-grown and well-colored Crotons. The second prize went to Nathaniel T. Kidder, and the third to Dr. C. G. Weld; Mr. Kidder taking the first prize for ornamental leaved plants, and for the specimen flowering plant with a well-grown and well-flowered *Ixora Dixiana*. E. W. Gilmore took the prize for six Orchids, and a silver medal was awarded to Mr. George McWilliam for a superb plant of *Alocasia San-*

deriana. Pitcher & Manda, of Short Hills, New Jersey, received the Society's silver medal for a plant of *Pteris Victoria*, and first-class certificates of merit for *Alocasia Chambieri* and *Dracæna argentea*. The same firm received a gratuity for a small collection of new and rare plants.

Notes.

The portrait published as a frontispiece to the *Popular Science Monthly* for September shows the face of Professor George Lincoln Goodale, of Harvard University, and is accompanied by a sympathetic sketch of his life and his labors in the interests of physiological botany.

In an article recently published in *Harper's Magazine*, it is stated that the New York Chamber of Commerce, one of the most intelligent and conservative bodies of practical business men in the world, regards the preservation of the Adirondack forests as "of vital commercial importance."

The memory of Dr. Joseph Priestley, the famous chemist and discoverer of oxygen, and a great-grandfather of our distinguished architect, H. H. Richardson, is perpetuated in botany by the name Priestleya, denoting a genus of some fifteen species of shrubs, natives of South Africa, and sometimes cultivated in northern greenhouses.

Other societies besides the well-known New York Flower Mission aid in the work of brightening the lives of the poor of New York during the summer. One of them is the New York Moderation Society, which distributes flowers, contributed by florists, in the most destitute and grimy regions of the Five Points and "Mulberry Bend." It is said that on the appointed days crowds of expectant children fill the sidewalks long before the welcome wagon appears. Both cut flowers and plants in pots are given away.

Spinach should be sown, according to *Meehan's Monthly*, a trifle before the forest-leaves color in autumn. It will then grow very rapidly in the temperate weather. No frost will injure the plant, but it should have a covering of straw so light that the green leaves can be seen through it. The use of this mulch is chiefly to keep the frost from lifting the plants out of the ground and to prevent the leaves from discoloring. The soil should be very strongly fertilized, for the richer it is the larger and more tender will be the leaves.

Modern botanical explorers may well envy the triumphant pleasures of those who, in early days, explored new regions, for now hardly any remain in the world which can offer anything approaching the same wealth of "novelties." How, today, can any one hope, even remotely, to compare his results with those, for instance, of Tournefort, who, after spending two years at the beginning of the last century in lands no further afield than Greece and Asia Minor, brought back representatives of 1,300 hitherto unknown species of plants?

Plants of *Hydrangea hortensis* will live out-of-doors in the vicinity of Philadelphia without any protection in the winter, and Mr. Joseph Meehan writes of a specimen in Laurel Hill Cemetery, which is one of the largest near that city. This plant is eight feet in diameter and four feet high, and recently held more than eight hundred, and probably a thousand, flower-heads fully expanded at once. The flowers on this Hydrangea, as well as on the many others in that cemetery, are of the deepest blue color, not one of them being pink or rose-color.

The Delaware peach crop has this year been unprecedentedly heavy, but it seems that growers have, nevertheless, something to complain of. It is estimated that two million baskets are needed for the crop; but as a great many basket-makers went out of the business in consequence of the disasters of the years 1889 and 1890, baskets are difficult to get, and their price has risen from three to five cents each. Factories are running at full speed with increased facilities, and growers are importing baskets from regions as distant as Michigan, yet the demand is not properly supplied.

According to a recent dispatch to the *Evening Post*, Professor J. C. Arthur has been examining the street trees in Cleveland, at the request of Mayor Ross, of that city, in order to discover, if possible, why so many of them are dying. Professor Arthur reports that the soot of coal, which closes the pores of the leaves, is one cause, and that water-tight pavements and deep sewers, which dry out the ground, is another cause. He recommends that smooth-leaved trees, like the Oaks, should be used instead of Maples and Elms. The street trees of Buffalo have also been reported in an unhealthy condition, and, for this state of things, Superintendent McMillan ascribes a similar cause, or, in his own terse language, "too much dust in the air and too little water in the soil."

In the report of the committee on nomenclature, made at the recent annual meeting of the Society of American Florists, it is stated that the existence and recognized activity of this committee has had a salutary effect upon the business of American Florists, and especially upon the catalogue trade. It is said that the catalogues of the present time are much more carefully prepared, so far as the naming of plants is concerned, than they were five years ago, and that the general tendency in them is toward plain facts, and away from sensational statements and sensational illustrations, notwithstanding a few aggravated instances to the contrary.

Among the superstitious precepts quoted by a recent writer in the *Journal of American Folk-lore* as current among the so-called "Dutch" of the Buffalo Valley in central Pennsylvania, we read: "All cereals, when planted in the waxing of the moon, will germinate more rapidly than if planted in the waning of the moon. Beans planted when the horns of the moon are up will readily pole, but if planted when the horns are down will not. Plant early potatoes when the horns of the moon are up, else they will go too deep into the ground. Plant late potatoes in the dark of the moon.. Plant onions when the horns of the moon are down. Pick apples in the dark of the moon to keep them from rotting. For abundance in anything you must plant it when the moon is in the sign of the Twins."

"Within a generation," says the *American Architect and Building News*, "the United States, from one of the most richly wooded countries in the world, has become comparatively sparsely provided with timber; yet such is the force of the habits handed down from our grandfathers, who supposed that the forests among which they dwelt were inexhaustible, that we still see our small remaining area of timberland diminishing day by day, partly under the axes of reckless lumbermen, and partly through the gigantic forest-fires, whose smoke obscures the sun over half the continent for weeks in every year; while in Germany, which at this moment pos sesses a forest-area much larger, in proportion to its population, than the United States, fire-wood is sold, in the cities, b the pound, all the forests are guarded by state officers, thory oughly educated for the purpose, the underbrush is kept cleared away, to prevent fires, the cutting of timber is restricted to a limited number of mature trees to the acre, so that the supply shall be kept constant, and no timber, except a little oak of specially beautiful grain, is sent out of the country; while the United States, out of a smaller reserve, exports timber to the value of more than five hundred thousand dollars a week."

A correspondent of the Philadelphia *Ledger*, writing recently of Alaska, says that one can scarcely imagine, from the usual forest-experience how closely the trees in the forests of that country are packed together. "I and my wife," he says, "undertook to walk four miles by an Indian trail through one of these woods to a point where we might head off our vessel. So thick was the mass of vegetation on each side of us, the path being wide enough for us to travel single file only, that we could not have seen a bear ten feet off. . . . One reason for the dense covering of the land with trees is the favorable conditions for seed-germination and the apparent scarcity of seed-eating creatures. The warm temperature given off by the Sea of Japan, which comes up south-westerly to break against Alaska shores, meets the snowy cold of the mountain-peaks, condensing the moisture so that the surface of the ground, or indeed anything else, is never absolutely dry, and every seed that falls to the earth has a chance to sprout and grow. In the old Indian village were White Spruces twenty feet high growing out of the top of totem-poles. These poles are themselves thirty or forty feet high, and seem to have been selected from the largest trees. They are stripped of their bark, and have carved on them series of likenesses of creatures, real and imaginary, representing the genealogical descent of members of the tribe. It was a curious sight to see the White Spruces, like huge Christmas-trees, growing from the flat tops of these poles. In some cases the roots of these living trees had split the poles in their descent downward to the earth, into which the roots had in some cases so thoroughly penetrated that should the poles finally rot away the trees would probably on these stilts of roots continue to grow on as trees high up in the atmosphere. Nothing but a climate continually saturated with moisture would permit of seed-sprouting and the tree continuing to grow out of the top of a pole in this manner."

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Artist and Client.

"IN the magnificent city of Ephesus," wrote Vitruvius nearly nineteen centuries ago, "there was an ancient law, hard indeed, but equitable, to the effect that when an architect was entrusted with the execution of a public work, an estimate thereof being lodged in the hands of the magistrate, his property was held as security until the work was finished. If, when finished, the expense did not exceed the estimate, he was complimented with degrees and honors. So when the excess did not amount to more than one-fourth of the estimate, no punishment was inflicted. But when the excess was greater than this amount the architect was required to pay it out of his own pocket. Would that such a law existed among the Roman people, not only in respect of their public, but also of their private, buildings, for then unskillful architects would not commit their depredations with impunity, and only those who were the most skillful in the intricacies of the art would practice it. Proprietors would not be led into ruin through extravagant expenditure. Architects themselves would be constrained to closer accuracy in their calculations, and the proprietor would complete his building for the amount, or a little more than the amount, which he expected to expend. Those who can afford a given sum for any work would cheerfully add one-fourth more in the pleasing expectation of seeing it completed; but when they find themselves burdened with the addition of half, or even more than half, the expense originally contemplated, they lose heart, and are willing to sacrifice what has been already laid out."

This passage is an interesting proof that human nature has not greatly changed in nineteen centuries, and that even the wonderful legal system of Rome, like the modern American system, did not cover all possible contingencies of dispute. How far an artist is justified in "exceeding the estimates" agreed upon at the outset of his labors, is a question still as frequently discussed as it was in the time of Augustus. Clients still protest that they are robbed when made to expend more than they anticipated, and doubtless artists then claimed, as they do to-day, that they may be so hampered as to destroy the artistic value of their work if a rigorous adherence to the bargain is insisted on.

It is, of course, difficult to say upon which side the blame most often rests. There are certainly artists in this time and land who are unskillful and who "commit depredations" upon the pockets of their clients without the excuse of giving him a superior piece of work in return for its extra cost. There are others who, while their artistic conscience is highly developed, have little pecuniary conscience; they honestly desire to give their client work of the highest quality, but they fail to remember that they are likewise bound to respect his pocket, and, if needful, to show him that he cannot have the best for the price he is willing to pay. On the other hand, clients too often insist on having the best, "regardless of cost," and afterward grumble about expense; or, a price once settled upon, they alter their demands without sufficiently considering that this may mean unavoidable increase in price. The task of a designer, whether his problem be to build a house or to lay out a park or garden, is a complicated one, involving outlays not only in final construction but in preparatory study, superintendence, and the office work of subordinates, which are rarely taken into account by the client, who thinks he has only to pay for stone and brick, soil and trees, and their actual manipulation. Every change from the plan first settled upon brings a new necessity for such outlays, even if it does not make needful the undoing of work already accomplished or the adoption of a scheme intrinsically more costly. "He keeps absolutely within his estimates if you do not change your mind," we heard a client say of a well-known architect not long ago, "but he is very extravagant if you change it." The truth is, that her change of mind had meant the need for renewed study on the architect's part, as well as more expensive features in the house. "The only way to get a house for the sum you have named," replied one of her hearers, "is to go abroad as soon as the contract is signed and not come back until the house is finished." The cause of many unfortunate disputes was certainly implied in this wise advice.

While there is reason, then, for insisting that some of our artists should be more conscientious as to expenditures, many clients also ought to reform their habits. There are a few rules which should be heeded by every person about to build or about to lay out a country place, and among them are these: Take plenty of time to decide, in consultation with the artist, just what it is you want. See that he understands you clearly, leaving no question of importance open for casual deciding as the work progresses. Then think no more about it, except to watch, if you will, lest, through misunderstanding or carelessness, something not in the bond is being done. Or, if you must change your mind, ascertain what the act will cost you and decide, before it is too late, whether you will assume the additional expense or not. Do not think that "a few little alterations" will be of no consequence. Probably those which seem little to you will not be little from the artist's point of view or in a pecuniary sense. If, however, you cannot decide upon what you want, hand over your house or your grounds to a reputable artist, name the sum you are willing to spend, and let him manage as he sees best—in which case you must not interfere at a later stage. And, finally, if you refuse to follow either of these modes of procedure, but give vague directions in the beginning, or recklessly change your mind from time to time, or else interfere when you have granted the artist a free hand to do as he likes, do not grumble at the sum you may eventually have to pay.

Indeterminate orders and loose bargains never result satisfactorily as regards either product or price, and it is the client's own fault if they are made. If the orders are clear, and the bargain hard and fast, and if then you are

asked for any important increase in price, the law will surely protect you as it would in a bargain of any other sort. But it is instructive to remember that in almost every case where client and artist have recently come into our courts, it is the artist whose claims have been sustained. When dealing with an artist many men, who are honorable and fair in other business matters, seem to think they have a right to get something for nothing, or to get more for a given price than was promised them. This proves that, as yet, we do not value art as we do other commodities, nor do we realize that the work of a man's brain has a marketable worth as fully entitled to respect as that of the work of his hands. If, indeed, we estimated art as it deserves—high above any commercial product—we should even feel willing to pay more for what we get than was at first decided. No artist, be he ever so conscientious, can, at the outset, tell to a dollar what a large and complicated piece of work will cost; and if we deprive him of the right to a reasonable margin of excess, we may fatally injure his work, and so commit a crime against him and against the art he practices. Vitruvius recognized this fact; although few clients to-day would be ready for a law which bade them stand ready to "add one-fourth more" to the contract price of a piece of architectural or landscape-gardening work if the artist demanded it; in fact, a much smaller increase often discourages them.

This may prove that modern men do not estimate art as highly as the ancients did; but, although human nature has not radically changed since the days of Augustus, the pecuniary conscience of artists has at least developed somewhat. It is still a common enough occurrence to find estimates exceeded, but seldom, we apprehend, to such an extent as fifty per cent., unless the client is wholly or partially at fault. If landscape-gardeners or architects or other artists were asked to fix a legal margin for such excess, they would probably be content with a smaller amount than the twenty-five per cent. of the contract sum. Vitruvius regarded this alleged Ephesian law as hard from the architect's point of view. Modern communities would regard it as very hard from the client's standpoint. We may conclude, then, that nineteen centuries have improved the architect more than the client, and that it is especially needful now for the client to look to his own development.

Nearly two years ago Professor W. W. Bailey complained in the columns of this paper (vol. ii., p. 610) that the linemen of some telegraph companies in Providence had been climbing the street-trees, and had mutilated them with the spikes on their feet, so as to invite attack from rot-fungus. Nobody seemed to have any authority to stop outrages of this sort, although Professor Bailey was informed in a later issue (vol. iii., p. 46) that the incident which aroused his feeling offered an admirable opportunity for testing the power of the citizen against the invasion of his rights. We allude to this matter again simply to introduce the statement that the last Legislature of Pennsylvania took pains to pass a law which provides directly for the recovery of damages to trees along the public highways by telegraph, telephone or electric-light companies. In the first section of this law it is enacted that when any company shall have erected poles and lines along any highway in the state it is lawful for the owner of the land adjoining, who may claim to be damaged by the maintenance of such lines by reason of the cutting of trees, whether in the highway or in the land adjoining, to petition the court of the county in which the damage has been committed; upon which petition the court shall appoint three citizens as viewers, who, being duly sworn to the faithful performance of their duty, shall assess the damage done to the petitioner and report the same to the court, which report shall, upon its presentation, be confirmed *nisi;* and if no appeal be entered to the same within ten days it shall be confirmed absolutely and judgment entered against the company. Lovers of trees in other states, who are contemplating additional legislation for their protection, would do well to study the text of this law, which was enacted on the 2d of June, 1891.

A Garden Pool.

One of the most important points to be considered in landscape-gardening is the relation of parts to the whole. A thing beautiful in itself may be so out of proportion to its surroundings that it fails in effect, either from being so large that it overpowers its neighborhood, or so small that it is insignificant. Constructed detail is particularly difficult to manage, so that its artificiality is not apparent enough to strike a false note in the general harmony. Rocks in composition are unruly, as too many unfortunate struggles to introduce them into parks and gardens bear witness. If isolated they are apt to be discordant, if grouped they are inclined to be cluttered; witness the rockeries in which so many country dwellers take pride. A cairn of stones interspersed with pockets of loam is a melancholy sight in winter, and in summer is too apt to be meaningless and intrusive, even when imperfectly concealed by masses of incongruous plants, sprinkled by a palpably unnatural fountain, and severely exiled, by trim cutting, from the lawn, of which it should form an integral part.

Appropriateness is too rarely considered in ornaments of this kind, which seldom bear refined relation to the things about them. Rough and informal constructions are particularly out of place in a purely formal system of lawn-planting, and are only to be endured where the nature of the ground suggests them, and enhances their beauty by suggesting that they are natural. We have selected the rocky basin, an illustration of which is to be found on page 439, because it gives an idea of fitting garden decoration, where the space is limited and the surroundings wild. The picturesque pool represented is a feature of a small terraced garden, built out from the rocky side of a steep hill that descends abruptly to the sea-shore of Massachusetts Bay. This terrace is approached from the level on which the house above it is built, by a rough stone stairway, that has for a balustrade a huge granite boulder, overgrown with Ivy, and surmounted with trees. Great rocks enclose the terrace on three sides, and down the almost perpendicular face of one of them trickles the thread-like stream that falls into the pool below. The overflow wanders away in a small grassy channel, along the edge of which tiny water-plants grow, and Cardinal-flowers blossom. In the basin a pink Water-lily is blooming, dainty dweller in a fairy home, and somewhere in the shadows a gold-fish has a lurking-place. On the stone curb a blue jug, and a Japanese drinking-vessel formed of a shell, with a handle of bamboo, give the requisite touch of human needs and uses to this lonely dell.

The little green-turfed terrace is encircled with flowers that thrive in this warm nook, where the morning sun shines hotly, and where its south-western rays are tempered by the shade of great forest-trees. So steep is the hill that the shining waters of the ocean are seen through the topmost branches of tall Oaks and Pines, while others stand far below. The brown seedy spike of a Dock-plant hangs out against the lichened crag, and forms a spot of rich color amid the prevailing gray, while all about, from crevices in the rocks, and from shady recesses beneath them, spring Ferns and Grasses, with wild flowers and picturesque weeds. Some young Sassafras-trees, or rather bushes, near by, which have sprung up of their own accord, have a particularly pleasing effect with their yellow-green leaves, and down the face of the rock straggles a Blackberry-vine, as perfect in outline and graceful in sweep as if it had been drawn by the hand of a Japanese artist, each cluster of finely serrated leaves having a distinct value against the mottled stony background, which also gives a

fine relief to the groups of flowers and ferns that cluster at the base of the pool.

In such a situation nothing showy should find place, but only those things which might naturally grow around a forest-spring. The little Cresses along the brook, the tender Forget-me-nots, the fine small Grasses, the water-weeds and ruby Lobelia, that have been wisely set here to enjoy the moisture, add to the wild-wood charm of the pool with its tinkling water.

Taste has gone hand in hand with nature and produced a lovely picture, delicate in detail, fine in color and grouping, harmonious in general composition. Minute the space is, almost as a Japanese garden, but the effect is dignified and poetic. It is not mere prettiness that charms, but the true artistic feeling with which the idea has been conceived and executed. The little scene touches and captivates, while gratifying all the senses with sound and sight and color, and soft touch of ocean breezes and of waving leaves.

The plate fails to show what is another feature of the real picture, a second semicircular terrace below, with Clematis-clad wall, to which one clambers by another flight of steps hewn in the rock to find more flowers and more lovely weeds and grasses, and a second space of well-mown turf, with a fine outlook on the tossing sea. From this a rugged path leads by devious ways to the beach below, where are boats and a yacht riding at anchor, and the wide stretch of the great deep, with white sails upon the surface and whiter clouds overhead.

A Fine Road.

ALTHOUGH in years gone by Chicago allowed a railway to be run along the lake-shore in the southern part of the city, there seems no danger that the mistake will be repeated, and, indeed, eastern cities might well emulate the care Chicago is now taking to make proper use of her water-fronts. The most noteworthy of recent improvements is the "Sheridan Road," which, starting from the end of the Lake Drive at the northern outskirts of the city, extends to Fort Sheridan, on the bluffs some twenty-five miles away. A correspondent of the *American Architect and Building News* recently wrote :

When first mentioned, this road was scarcely more than an idea, while by utilizing, to a certain extent, existing roads and condemning property, the general outlines of the scheme are now practically completed. The plan is to keep much of the picturesqueness of the country road, while a few of the conveniences of a city drive will be connected with it. The ditches, which heretofore have bordered the old road in many places, will have to disappear; in fact, have partially disappeared already. Drains are laid, the ditches are filled in and then sodded over, so that while the actual drive-way will not be made any wider than it is at present in many of the old roads, ample accommodations will be given for an occasional crowd upon the turf on either side. Space is gained in this way, and the amount of area liable to become dusty is lessened. Concrete sidewalks are being laid along the way, and before many years will, very probably, be laid most of the way to Chicago. . . . Where the original country road skirts the bluff quite closely, it has been converted into the Sheridan Road, but in places where it leads away from the lake new routes are being surveyed for the proposed drive. In tracts already opened up by it in the vicinity of Chicago marked advances are noticeable in the price of real estate, as well as a considerable amount of building. This growth has been gradual and healthy, and the homes being erected along the shore of the lake are of an extremely good class. . . . There is nothing wild or rugged about this shore of the great lake, but for quiet beauty this northward stretching coast has nothing to equal it in any way in the near vicinity of Chicago, and this locality must assuredly be destined to be the site of the finest summer houses around the city. One feature of this lake, which few realize who do not live by its side, is the immense size and amount of the shipping which passes daily up and down its northern shore. . . . At the terminus of the drive is Fort Sheridan, which, for the last three years, has been slowly assuming a somewhat settled aspect, till now this brand-new United States army fort is looked upon as one of the sights worth seeing in a visit to Chicago. It is situated on bluffs seventy-five or eighty feet above the lake, and with its winding ravines has at least much natural beauty to help out whatever improvements the Government may see fit to lay out on it. To reach the long Government pier a road was necessary, and, fortunately for the picturesqueness of the place, a more accessible one could be cut through one of the beautiful ravines, where a more gradual ascent could be made than up the steep bluff. This fine drive-way leading to the pier is now one of the features of the place.

Not only scattered semi-country homes, but "model villages," are already growing up along the Sheridan Road, laid out with broad tree-planted macadamized streets and controlled with a disregard of mere private eccentricity in taste, and a demand for general neatness and harmony of effect and for common comfort to which, one might have thought a few years ago, no Americans would ever submit. But, in truth, Americans are quick to appreciate improvement in any direction, even when it somewhat limits individual impulses, and there is no happier sign for the future well-being of our communities or the future aspect of our land than such carefully ordered villages as those which, in more than one of our western towns, are taking the place of those old-fashioned outskirts which have made the term suburban residences a by-word of reproach and a symbol of uncomfortable living in so many of our older localities. Such enterprises as the Sheridan Road prove, of course, the immense material as well as æsthetic value of a fine highway, and supply examples which can be used with telling effect elsewhere.

Notes on North American Trees.—XXVII.

THE number of changes in the names of our arborescent *Leguminosæ*, made necessary by the restoration of the oldest specific names, is not large.

The Clammy Locust is generally known as *Robinia viscosa*, the name given to it by Ventenat and published in 1803 in the "Description des Plantes Nouvelles et peu Connues Cultivées dans le Jardin de J. M. Cels," but it had been described, two years earlier, in England in the *Botanical Magazine* (t. 560) as *Robinia glutinosa*. This last name, which has every claim to priority, was taken up by Koch in his "Dendrologie," but has been neglected by other authors.

The character of the buds of Robinia is not explained in any of the published accounts of these trees which I have read, except in the "Flore Forestière" of A. Malhieu, who hints, in his third edition, published in 1877, at their structure and arrangement. Sir John Lubbock, who has recently published the result of his observations on the development and uses of the stipules of a number of plants, says that "the winter-bud of *Robinia Pseudacacia* is protected by three short, brown, triangular-pointed scales" (*Jour. Linn. Soc.*, xviii., 228). In reality, there is not one but three or four superposed buds under each petiole, and they are not covered individually by scales, but are sunk in the cavity under the base of the petiole and covered collectively by a thick scale-like coat which is lined on the inner surface with thick rusty brown tomentum, and which, in early spring, splits open to allow the growth of the upper and larger of the four buds, which is the only one that develops, although, if this is injured or destroyed, it is, no doubt, replaced by the next bud below it. The parts into which this bud-like covering splits remain on the base of the branches during the season. The subpetiolar buds are often accompanied by a supplementary supra-axillary naked bud, corresponding to the supra-axillary bud in Gleditsia which develops into a spine. In Robinia this supra-axillary bud, late in the season, sometimes produces a feeble branchlet, especially on vigorous shoots, which, probably, does not survive the first winter The apparently superfluous number of buds and their careful protection enables Robinia to pass uninjured through periods of excessive winter cold, and accounts for the ability of these trees to inhabit regions many degrees

north of their native home. *R. glutinosa* and *R. hispida* grow naturally only in the southern Alleghany Mountains, at the same altitude, and nearly at the same elevation, as *Magnolia Fraseri*, but are hardy several degrees farther north than that tree.

The nature of the buds of Cladrastis, which appear to have escaped the attention of botanists, also enables this tree to flourish many degrees north of the somewhat restricted region west of the southern Alleghany Mountains, which is its home. The buds are sub-petiolar, but I do not find that it has been explained that, instead of a single bud, there are under each leaf-stalk four, superposed and closely compressed together, forming by mutual pressure a rather thick cone, each bud being covered with thin lustrous scales. The lowest one is minute and rudimentary, and probably it is only the upper one which develops into a branch. If this should be injured, then perhaps the next one takes its place. The four sub-petiolar buds of Cladrastis serve to keep it separate from the Asiatic Maackia (united by Mr. Bentham with Cladrastis), which has solitary supra-petiolar buds, besides differing in habit, in inflorescence, in its accrescent persistent bud-scales, and in some floral particulars from the American tree, as has already been pointed out by Maximowicz.

The Jamaica Dogwood, a fine tropical tree which occurs on the keys of southern Florida, was described by Linnæus in the first edition of the "Species Plantarum" as *Erythrina Piscipula*. Later he recognized it was not an Erythrina, and made a new genus, Piscidia, to receive it, changing, however, the specific name in the second edition of the "Species Plantarum" from Piscidia to Erythrina. The successors of Linnæus have written *Piscidia Erythrina*, but if the oldest specific name given to a plant by Linnæus, or by any subsequent author, is the name by which the plant is to be known, then that of the Jamaica Dogwood must be *Piscidia Piscipula*.

The synonymy of the Water Locust is confusing. It was first described by Linnæus in the first edition of the "Species Plantarum" as a variety of *Gleditsia triacanthos*. Miller, in the eighth edition of his Dictionary (1768), called it *G. inermis*, which would be the oldest name for the Water Locust had it not been already appropriated by Linnæus in the second edition of the "Species" (1763), in which there is a *G. inermis* taken up from a plant of Duhamel's which Mr. Bentham (*Trans. Linn. Soc.*, xxx., 557) was probably right in considering the spineless form of *G. triacanthos*, although Duhamel himself supposed that it might be the *Acacia Javanica* of Plukenet ("Phyt.," t. 123, f. 3). The identity of this plant was further confused by Linnæus referring to it Miller's figure ("Icon.," t. 5), which represents *Calliandra Houstoni*, a tropical American plant, which, Mr. Bentham remarks, could "only have been quoted by Linnæus at second hand or through some inadvertence." In any case, the *G. inermis* of the second edition of the "Species" cannot refer to the Water Locust, which still appeared there as a variety of *G. triacanthos*, so that Miller's name, being a synonym, is not available, and the next oldest name, that of Marshall (1785), *G. aquatica*, will have to be adopted. Fortunately, the name is the best of all those which have been given to this tree, which grows in water or in very wet places.

In the spelling of the generic name I have followed Linnæus in writing Gleditsia, although most modern authors have changed his name to Gleditschia. *C. S. Sargent.*

New or Little-known Plants.

Cereus (Pilocereus) Sargentianus.

THIS plant has eight or more stems from the same base, the sterile stems two to five feet tall, five or six angled with obtuse ribs, separated by broad, deep intervals; the woolly areolæ closely set and touching each other on the ribs, the gray spines stout, straight, one-fourth to three-fourths of an inch long, in clusters of ten or more; the flower-bearing stems ten to fifteen feet tall, erect, five or six angled, intervals usually shallow, the ribs closely set with woolly oblong areolæ, each bearing about fifty long, flexuous, grayish or white spines which almost hide the small inconspicuous flowers.

The flower is of a delicate shade between rose-pink and flesh-color, an inch long and less than an inch across; petals about twenty-four in number, thirteen scales in the ovary; anthers yellow, filaments, style and stigmata white.

The Indian name of this Old-man Cactus is *Carambuya* or *Garambulla*, and it is called by some *Hombre viejo* or *Cabeza vieja*, according to Brandegee, who found it from Comondu to San Quintin, Lower California.

I have referred this plant hitherto to *Cereus Schottii*, Engelm. (vide Garden and Forest, iii., 439), and Brandegee (*Proc. Cal. Acad.*, 2d ser., ii., 163) has referred to it by the same name.

I first found it near San Quintin, Lower California, in 1886. The fruit I have not seen, but it is said to be edible, without spines, red, and attaining a much larger size than the fruit of *C. Schottii*, as is evident in the illustration (see page 437), from a photograph taken by Messrs. Roscoe Howard and Russell Gannis.

The plant differs also in the number and characters of the spines, and will probably prove to be a distinct species. I therefore venture to name it provisionally for Professor C. S. Sargent, whose interest in the Mexican flora is well known.

San Diego, Cal. *C. R. Orcutt.*

Foreign Correspondence.

London Letter.

THE most interesting event of the week in the open-air garden is the flowering of *Lilium Parkmanni* in the Knap Hill nursery, Woking, where only it can be seen. By reputation this Lily is known to all who take an interest in Lilies, but comparatively few have seen it in bloom, as it flowers when no unusual display attracts visitors to the great Surrey nursery. As every Lily-grower knows, we are indebted to America for this magnificent Lily, considered by many the queen of the whole family, and it is a singular fact that none of our hybridists have obtained such successful results as did Mr. Parkman, though they have tried over and over again to raise a similar hybrid between *L. auratum* and *L. speciosum*, which are the parents of Parkman's Lily. Neither is it likely that this Lily will ever become common, owing to the slow way in which it increases. For thirteen years has Mr. Anthony Waterer been trying to make the most of the four bulbs he bought from the raiser at the highest figure that has ever been paid for a hardy herbaceous plant. Those who do not know what Parkman's Lily is like must imagine a very large *L. auratum* flower, a foot across from tip to tip of the petals, each banded like auratum with yellow and stained with the richest carmine-crimson and broadly edged with white. Every Lily specialist here is eagerly waiting for its distribution, and, no doubt, it will then soon find its way back to the land of its birth.

An uncommonly successful meeting was held this week by the Royal Horticultural Society at Westminster, and quite a number of novelties were placed before the committees. Gladioli from Kelway, and Dahlias from various growers, were the special features, but several other interesting plants were there, and especially Orchids. There seems to be now a continuous succession of hybrid Orchids, for at every meeting one sees new ones. The most important new hybrid shown on this occasion was from Messrs. Veitch. This was a Lælio-Cattleya named Nyssa, a cross between *Lælia* (*Cattleya*) *crispa* and *C. labiata*, var. *Warsceiczii*. The progeny is intermediate, both in growth and flower, the latter being somewhat larger than those of *L. crispa*. The sepals are a delicate mauve and spread out widely; the labellum is larger than in *L. crispa* and quite shows the dilation of that of *C. labiata*; the color is an intensely deep purple-crimson, surrounding an in-

terior blotch of golden-yellow, and with a well-defined crisp edging of white. Altogether, the flowers recall the features of the rare *C. Exoniensis*, one of the earliest hybrid Orchids of Dominy's. It is looked upon as one of Mr. Seden's chief successes in hybridizing. Another hybrid Cattleya was named *C. Behrensiana*, from Messrs. Sander, of St. Albans. It is a cross between *L. elegans* and *C.*

Fig. 69.—Cereus (Pilocereus) Sargentianus.—See page 436.

Loddigesi. The growth is similar to that of *L. elegans*, but the leaves are broader and shorter. The flower is as large as those of the latter; sepals very pale lilac; lip broad, amethyst-crimson on the lower lobe, white on the incurved upper lobes. Though not such a strikingly distinct hybrid as that from Messrs. Veitch, it was much admired. A third hybrid Orchid was *Masdevallia Measuresiana*, a pretty and interesting little plant obtained by crossing *M. Tovarensis* with *M. amabilis*. The flowers are about the size of those of the latter, and with attenuated sepals which are white striped and clouded with violet-purple, and the influence of *M. Tovarensis* is seen by the several flowers it carries on each spike. *Cypripedium apiculatum*, a cross between *C. Boxalli* and *C. barbatum*, was from Mr. Palmer, of Reading. It has the mottled foliage of *C. barbatum* and the flower of *C. Boxalli*, rendered darker by the crossing, and with spots on the lateral sepals, but the dorsal sepal is much reflexed, which detracts from the symmetry of the flower, and is considered a fault by orchidists.

A supposed hybrid named *C. leucochilum*, between *C. Godefroyæ* and *C. barbatulum*, was shown, but the evidence of the cross was not clear, and so may be passed over. Besides the hybrids there were shown *Dendrobium Phalænopsis*, var. *Statterianum*, a really splendid variety, much superior to the type, inasmuch as the spike is longer, the flower larger and more deeply and richly colored. The broad sepals are a purple-crimson, and the labellum many shades deeper. *Sobralia leucoxantha*, with the growth of *S. macrantha*, has flowers five inches across, sepals snow-white, lip broad, frilled at the margins, and of a rich golden-yellow. It is one of the loveliest of all the species and a rival to the rare *S. xantholeuca*. It came from Messrs. Seeger & Tropp. *Cattleya amanda*, also known as *C. Rothschildiana*, is a pretty Orchid at this season, supposed to be a natural hybrid, and reminds one of *C. maxima*, having sepals of a pale rose-pink, with a deeper lip with purple veins. A very uncommon looking Orchid, under the name of *Zygopetalum grandiflorum*, came from Messrs. Shuttleworth & Co. It has the habit of growth of one of the larger Maxillaria and one-flowered spikes. The flower is three inches across, pointed, broad sepals, pale green, striped with purplish brown, and a large labellum, white, lined with purple.

The Gladioli from Messrs. Kelway, numbering hundreds of spikes, made the usual magnificent display, though, owing to the cold wet season, they were not as fine as in former years. Many new seedlings were submitted to the committee, but only a few were distinguished by awards of merit, because it is so difficult to discern the difference between the new and the old kinds among the Gandavensis section, now that the climax of perfection has been reached as regards size of spike, shape and size of individual flowers, and brilliancy of coloring. A smaller collection of Lemoine's hybrids, which Messrs. Kelway have at length taken in hand, comprised some wonderfully fine sorts, and it is in this section that we must in future look for progressive improvement, for, though they are at present inferior in spike and bloom to the Gandavensis tribe, they combine such striking contrasts of colors that they will probably prove a far more valuable race of garden-plants, since they are so much hardier and may be left in the open ground here throughout the year, which, to amateurs, is a great consideration. There has been such a rapid improvement made with this race that Lemoine's original seedlings are rarely shown now, though the features of those first hybrids are plainly discernible in newer sorts that have been again crossed with the finest of the Gandavensis type. The first bright, clear yellow Gladiolus that I have seen was among Kelway's new seedlings, and others had those combinations of yellow and crimsons, pinks and scarlets, that render them so distinct from the ordinary Gladioli.

The Dahlias, like the Gladioli, were in strong force, and a great number of new, or so-called new, sorts were placed before the committee, especially novelties in the Cactus-

flowered section. Messrs. Cannell, of Swanley, seem to be leading in the race for novelty, and certainly some of their seedlings are of great beauty, and, for the most part, distinct from older kinds. They had a few new colors representing the true original Cactus Dahlia (*D. Juarezii*), not the nondescript coarse-flowered sorts that pass as Cactus-flowered Dahlias. Their new Swanley Cactus is a counterpart of the Juarez Cactus, having the same semi-quilled florets, but of a much more brilliant scarlet. Their other varieties of Cactus—Ernest Carronel, magenta-crimson; Robert Cannell, bright carmine; Oban, yellowish, flushed with plum-purple; and Eynsford Gem, purple-crimson—were among the finest of a remarkable collection of Cactus Dahlias. Other great Dahlia-growers, such as Keynes, of Salisbury, and Phippen, of Reading, had large collections of single show and pompon varieties, but they did not attract such attention as the group of new Tom Thumb single Dahlias, from Cheat, of Crowley, who has acquired the stock of these remarkable pigmy Dahlias from the raiser, Mr. Girdlestone, the well-known rosarian. This dwarf race of Dahlias grows at the tallest only eighteen inches high, and are sturdy in growth, and are very free-flowering. For massing in beds on lawns they are of especial value, as they require no supports. There is nothing extraordinary about the flowers, which are all single, but there is no knowing where this new break may lead. They are different from the dwarf double varieties that have been grown during recent years.

Some interesting Lilies from Messrs. Low were noteworthy, especially the variety of *Lilium Wallichianum* named Superbum. It has flowers in shape like *L. longiflorum*, but in this variety they were much larger. They are white, and colored on the inside with pale yellow. The plant grows some three feet high. Another fine Lily from the same exhibitor was *L. Nepalense*, also from northern India. This is a Turk's-cap Lily with large flowers of a blood-red color, with the petals broadly tipped with yellowish green. It is a striking plant, and still very rare in cultivation. Some slight forms of *L. longiflorum*, under the names of Magnificum and Giganteum, were shown, but they were not superior to the variety Takesima, which was shown grandly in a mass, and which were described last week.

Other bulbous plants were *Crinum Powelli*, the very fine hybrid between *C. Moorei* and *C. Capense*. It carries a stout flower-stem, bearing from nine to twelve flowers of a lovely rose-pink, and nearly as large as in *C. Moorei*. It has proved quite as hardy as *C. Capense*, and is, therefore, an invaluable addition to our open-air flowers. This was from Sir Trevor Lawrence, who also showed the hybrid *Cyrtanthus rosea*, interesting and beautiful, but not so fine as the old *Vallota purpurea*.

Among the trees and shrubs from Messrs. Veitch the committee selected *Cupressus Arizonica* as worthy of a certificate of merit. It reminds one of *C. macrocarpa*, but is more glaucous, and it is evidently an elegant shrub, and the fact that it has proved quite hardy at Coombe Wood, in Surrey, enhances its value. *Retinospora squarrosa sulphurea*, with slightly yellowish foliage, and *Cupressus Lawsoniana versicolor*, with ill-defined yellowish variegation, were two other novelties from the same exhibitors, who also had a fine gathering of the beautiful *Eucryphia pinnatifolia* alluded to last week. The beautiful new hybrid, *Hypericum Moserianum*, was shown in fine flower by Mr. Anthony Waterer, of Knap Hill, who thinks so highly of it that he is growing it on a large scale in his nursery since he has proved its thorough hardiness and its free-flowering character and elegant growth. Under the name of *Catalpa Himalayensis* Messrs. Veitch have in flower a variety that flowers habitually when only a few feet high. In other respects it is not different from *C. bignonioides*, so far as I can judge. The name may be wrong, but perhaps this variety is cultivated in the Arnold Arboretum. If so, it would be interesting to know what it really is.

London. *W. Goldring.*

Cultural Department.

Iris reticulata and its Allies.

About twenty-five years ago the typical form of *Iris reticulata* with violet-blue flowers was introduced into cultivation through the agency of English and Russian botanists. It is a very hardy plant, flowering in early spring, and its fresh-colored flowers, with narrow falls and standards, are very striking. The Reverend G. T. Nelson, of Aldborough, whose name is prominently associated with the improvement of hardy plants, first produced, through constant sowings and careful selection, two new forms of this Iris, named Major and Cœrulea. The first is a more robust plant than the type, stronger in all its parts, and the divisions of the flower are broader and more spreading, thus presenting a larger surface of color. The second resembles the type except that the plants are cœrulean blue. Dr. Edward Regel, not long after the introduction of *I. reticulata*, introduced the deep purple-flowered *I. reticulata Krelagi*, with rather dull-colored flowers. Forms, however, raised from seed of this and others obtained from Koordistan produced brighter-colored flowers. About the same time *I. reticulata cyanea* was introduced by Haage & Schmidt, also from the Caucasus. It has a smaller flower than the last, but the small size is more than compensated by its lovely color, the falls being dark blue, with an orange blotch, the standard pale sky-blue. These are all the forms of *I. reticulata* proper, its specific name, by the way, being derived from the netted outer coat of the bulb.

It appears, however, that the type in descending from the lofty heights of the Caucasus plain eastward to Persia and southward to Palestine has undergone material changes in the form and color of the flowers, and that from the original *I. reticulata* have been developed by gradual evolution species of greater beauty and of greater value to the horticulturists than *I. reticulata*. Boissier, the great botanist, brought home from Mount Gherizin, in Palestine, thirty years ago, some bulbs of the lovely *I. Histrio*. This is an early-flowered plant, producing in mild winters its flowers as early as January in Germany. It is distinguished from *I. reticulata* by the broader blade of the falls, with brilliant ultramarine blotches on a white ground. In later years *I. Vartana* has been introduced through the exertions of Professor Foster, of Cambridge, and of Dr. Vartan, of Nazareth. This plant produces here greenish blue flowers in November. Fifteen years ago Mrs. Danford, during a hunting trip which she made with her husband in the Sicilian Taurus, discovered the small, but brilliantly flowered, *I. Danfordiæ*, which three years ago was found again in large quantities by Sintinis in northern Koordistan. These plants have succeeded well at Baden-Baden, and, in spite of snow and ice, have flowered in February and March, or when they have been potted and kept in the greenhouse they have flowered as early as November. Later a variety of *I. Danfordiæ*, or perhaps a distinct species, *I. Bornmüleri*, was found by Bornmüler in another part of Armenia, and sent to Baden-Baden. It differs from *I. Danfordiæ* in its more robust growth, in its broader floral segments, with a green stripe on the claws, the green color being of a slightly deeper shade of yellow.

Through the kindness of American missionaries in Armenia, Professor Foster received a number of other forms of Iris, and in search of these I was fortunate enough to introduce a large quantity of *I. Bakeriana*, *I. sophenensis* and *I. histrioides*. *I. Bakeriana* has sky-blue standards, with white falls tipped and penciled with deep indigo-blue, with an indigo-colored blade marked with orange. The flower is very sweet-scented, and opens toward the end of February. The flowers of *I. sophenensis* appear in all shades of color, from almost white to mauve-purple and metallic-red. It grows well and flowers early. *I. histrioides* is, perhaps, the prettiest of all the group, appearing in the form and color of the flowers almost intermediate between *I. reticulata* and *I. Histrio*. This also flowers very early,

and the flowers present a large surface of the brightest ultramarine-blue shading, or varying in some individuals to violet, and in others to a paler shade. All these plants are very easy to cultivate, and, when better known, are sure to become general favorites. In America, where in early spring-time heavy snow may occur, it will be necessary to plant them in frames, or to make such arrangements that when they are in flower they may be protected. At Baden-Baden they are planted in borders along the bottom of walls, where they can be kept safe from the destroying influence of heavy or wet snows by leaning mats against the wall over the beds.

Baden-Baden. *Max Leichtlin.*

Fig. 70.—A Garden Pool.—See page 434.

Keeping Fruit in Winter.

A WRITER is quoted as objecting to the practice of gathering apples for keeping "as soon as the pips begin to turn brown." He says apples gathered at this stage "do not keep as well, or average of so good quality." Certainly they do not. An apple makes a noticeable portion of its growth—often as much as one-fourth—while its seeds are coloring. But, on the other hand, the keeping of late-ripening apples is greatly lengthened by gathering them as soon as the seeds are fully colored. Up to that time the fruit improves on the tree. After that it deteriorates, so far as keeping is concerned, and, with some varieties, it deteriorates rapidly, so that winter fruit becomes in a few days fall fruit.

The art of handling fruit for keeping is very imperfectly understood, both as regards principles and practice. The season of many of our fruits is capable of being much lengthened in the hands of growers and dealers who are willing to learn and make use of the principles involved. In the first place, so far as Nature's purpose is concerned, the external coverings of the true fruit—that is, the seed—exists primarily for the sake of the seed itself, and only secondarily for its envelopes, which are the parts that give it its chief value for human use. As soon as the fruit and its seeds are ripe the fleshy exterior part begins to decay, and what we call ripening or maturing are only primary stages of that process, which is to release the seed, so that it may grow into a new plant.

After the fruit is carefully gathered, the whole question of keeping resolves itself into a question of temperature, but with due attention also to moisture. Pears, apples and grapes require a low and uniform temperature, and proper protection from fungous attacks. Aside from the latter danger, which may be favored by dampness, a saturated atmosphere is not objectionable; but care must be taken not to allow cold fruit to be taken into a warm atmosphere, producing that deposit of visible moisture upon its surface which is erroneously called sweating. In such cases it is not so much the moisture itself that harms the fruit as it is the moldiness which is apt to ensue. Apples can be well preserved in very damp cellars if these points are kept in view. In fact, a cellar with a spring in it is thought by many fruit-growers to be specially favorable to the perfect keeping of apples. In Russia it is a custom to preserve apples fresh in cold water; and the late Charles Gibb, of Abbotsford, Quebec, once told me of some very fine Fameuse apples which he found on sale in April, and which, he was told, had been part of the cargo of a canal-boat that had sunk and been frozen in and had just been raised. The Fameuse can rarely be kept in air much beyond the first of February.

The temperature of a fruit-cellar is best when kept as near to the congealing temperature of the fruit as possible. It is not safe to freeze so watery a fruit as the grape; but apples and pears can be frozen without injury, if slowly thawed again in the dark. I am not quite sure of the latter condition being essential, as I have had apples that had been slowly frozen, and as slowly thawed, in a light cellar, come out of the trial apparently uninjured.

But, unquestionably, an even temperature, near to freezing, is the best. Even this, however, is of small avail toward good keeping if the fruit does not go into its cold storage in

perfect order, and at the right stage of its existence. That stage is reached, in apples and pears, as soon as the seeds are fully colored. Fruit designed for long keeping should be gathered early in the day, or in cloudy weather. A barrel of sun-heated apples, even if put at once into a cool cellar, has lost greatly in keeping quality. If fruit must be gathered in the heat of a sunny day let it be in baskets, which are to be kept under airy cover until they are well cooled before they are placed in the cellar.

For the best results gathering and assorting ought to be simultaneous; but in a large orchard, when careful hands are scarce, this is not possible, and the best alternative is a large and airy sorting shed, where the work can be deliberately done by skilled hands. I prefer round-bottomed half-bushel baskets, with drop handles, for use in gathering and assorting. It takes a good many of them in a busy time, but in the end they are economical. They are easily handled, and will not be slung around, as bushel baskets with side handles are sure to be, to the great injury of their contents. The small baskets can be put down into the barrel and emptied without bruising their contents in the least. Hand-barrows for two men are much better than wheel-barrows. A stone boat answers well on smooth, level ground.

As an evidence of the value of careful attention to all the points above referred to, I may be allowed to say that our chief winter apple in northern New England is the Wealthy. Observing all these rules, I find that I have not the least difficulty in keeping it firm, fresh and free from decay up to April, while less careful neighbors (and growers generally) decry it as merely a fall apple. By similar care the Gravenstein, grown in southern Maine, is found in the Boston market all winter in prime order.

Newport, Vt. *T. H. Hoskins.*

Dracænas.

THESE useful plants are generally easy to grow; they often have bright foliage, and all are graceful in habit. In a majority of instances they are most satisfactory when grown moderately warm, though some varieties do well in a cool house. Moderately light soil is most suitable, but it should be well enriched with some old manure, and the addition of some bone-dust will be beneficial.

They are readily multiplied by laying the canes in sand or moss, or a combination of both, in a warm house, and young plants will be produced from nearly every joint. For large specimens it is best to root the top of an old plant by making an incision in the stem, and then covering that portion with moss in order to induce root-growth. By this means a specimen may be secured with large foliage close down to the pot.

While most of the varieties and species of Dracænas require plenty of light at all times, yet it is better for many of the more tender ones to have a slight shade during the summer, else some of the foliage may be injured. During the past ten years or so there have been many fine hybrids introduced, but there are excellent varieties among the older ones, and as these are more easily procured, they will be the ones chiefly spoken of in these notes.

Prominent among these older sorts is *D. amabilis*, which has leaves nearly two feet long and from four to five inches wide, the ground color bright green and the central leaves suffused with creamy white and frequently tinted with pink. *D. Cooperii* is another fine variety, which probably originated from the well-known *D. terminalis*, as, in fact, have a large number of good varieties. The leaves of *D. Cooperii* are, however, much broader than those of *D. terminalis* and are gracefully recurved, the color being reddish bronze, while the young leaves are frequently bright red.

D. Chelsoni is remarkably handsome when well grown, the leaves being large, dark green, and marked with crimson.

D. ferrea is another fine variety that has long been known in gardens and is of rather upright habit, with leaves about one foot long and purplish red in color. This variety and *D. terminalis* are among the most satisfactory kinds, with colored foliage for vases and other out-door decorations.

D. gracilis is not often seen now, though well deserving of a place in any collection. It is of slender habit, and the stem is thickly clothed with narrow, dark green leaves, the latter being edged with a narrow border of dull crimson.

D. Dennisonii is a handsome dwarf variety, and has broad purplish leaves that are about one foot long. The leaves of this variety are closely arranged on the stem, and it makes a very compact little specimen.

D. magnifica is quite a contrast in size with the preceding, the leaves of this variety being often eight to ten inches wide and two feet long; the color being pinkish bronze with darker petioles.

Still another fine one among the large growers is *D. Mooreana*, in size somewhat similar to the preceding, but much darker in color.

D. indivisa Veitchii and *D. indivisa atropurpurea* are two decidedly ornamental forms of this popular species, and are admirable for out-door planting or for conservatory decoration. They both have the long and graceful leaves of the type, but differ therefrom in color, *D. Veitchii* having a reddish midrib, and *D. atropurpurea* has a purplish flush about the base of the leaves and a darker midrib than its companion.

D. fragrans is still reckoned among the popular decorative plants, its broad dark green leaves having a very pleasing effect, while the two variegated forms of this species are both worthy of cultivation, *D. variegata* having most of its creamy yellow color about the margin, while that of *D. Lindeni* is chiefly found in the central part of the leaves.

It may be noted, too, that *D. indivisa* also has produced variegated forms, that known as *D. Doucetii* being, perhaps, the prettiest.

D. umbraculifera is a somewhat unusual species, but makes a fine specimen, the narrow leaves being very dark green and glossy, and very closely arranged on the stem, from which they diverge in umbrella form.

This species is, however, rather difficult to increase, as it makes a stem very slowly.

Holmesburg, Pa. *W. H. Taplin.*

Notes on American Plants.

Chelone Lyoni, one of the Turtle Heads, a native of the southern states, is in flower the last of August. The plant is rather stocky, about fifteen inches high, and bears, in long succession, handsome rose-purple flowers an inch long. The numerous leaves are oblong-ovate and very dark green.

Sedum telephoides, from the same locality, is a useful plant to cover rockwork, and will live almost on air alone. It grows on dry rocks. Its height is about one foot, and the thick, fleshy leaves, as well as the stems, have a purplish tinge. The not very attractive flowers are borne in small cymes, and are of a pale flesh-color. This species, with *S. Telephium* (Common Live-for-ever), could be grown in places where few, or no other, plants of their size would live. Their foliage remains fresh the entire season, and the thick compound cymes of purple flowers of the last are certainly quite attractive.

Our North American Gentians, of which there are said to be fifty species and varieties, are for the most part worth cultivating. They do not transplant so well as most of our wild flowers, but if the soil is light and moist they generally establish themselves by the second year. They are late-flowering plants and come at the season when they are most needed.

The Soapwort Gentian (*G. saponaria*) has proven with us a good species for cultivation, and its pale blue flowers appear at nearly the same season with those of the White Gentian (*G. alba*), making a fitting companion to it. Both do well in either sun or thin shade, in a light moist soil.

G. linearis is found in swamps, and is a good species to plant in artificial bogs, in not too wet or sunny portions, but in partial shade and elevated, so as not to be wet. It likes a peaty soil. It has simple, slender, leafy stems, often over two feet high, terminating in three or more blue flowers an inch or thereabout in length.

Few of our wild flowers surpass the Fringed Gentian (*G. crinata*) in attractiveness, but, unfortunately, it is a biennial and a difficult plant to grow.

G. Amarella, var. *acuta*, is a boreal variety often only six inches high, with pale blue flowers half an inch long. We have never attempted its cultivation, but, no doubt, it should be treated as an alpine.

Charlotte, Vt. *F. H. Horsford.*

Hybridizing the Sweet Pea.

THERE are several ways of producing new varieties of Sweet Peas besides hybridizing. Special strains may be developed by selection. Old varieties may be increased in size. Occasional sports will hold good from year to year. The striped sorts have a way of ranging back and forth from delicate markings, and even pure white, to solid colors. For instance, the Senator, a noble flower in dark stripes, and of the new, large form, has, with me, this year produced a solid purple blossom, which, if it can be held, is an acquisition. Since Eckford himself leaves many hybrids without a name,

other experimenters ought to be cautious about claiming anything new.

Hybridizing must be the short and sure road to really new varieties of merit. I can only speak from a short experience, but my experiments this year seem to warrant more confidence than those of last year.

Each Sweet Pea blossom is an independent and self-fertilizing flower. The keel is a sac containing the stamens and pistil, and in healthy blossoms the latter rarely are exposed. So jealously does each blossom fertilize itself that it sheds its pollen when about half-open, and the sac at the upper end draws snugly up around the anthers, pressing them closely about the stigma. Cross-fertilization, even by bees, is almost impossible. The bumble-bee comes, but he works down at the base of the wings. No member of the Pulse family appears to be in less danger of mixing than the Sweet Pea.

But here is a neat and difficult opportunity for artificial hybridizing. My experiments in trying to cross them after the blossoms were open had no effect. This year I have worked on the buds. They must be taken before they have pollinated, and to mutilate the bud so early is rough treatment. The few pods which I have secured this year are a modest but much-prized return for the patient labor expended. My judgment now is that it is preferable to take the lowest bud on the stem, at just the right stage, and remove the others, to give all the strength to one. Delicately open the sac and cut away the stamens. Let the bud stand till it would naturally pollinate, and then cross-fertilize as you wish. Better than using a pencil-brush I have found that by tearing away the standard and wings of the blossom whose pollen you wanted, you could lay open the sac gently with a penknife, and, like an oyster on half-shell, you had the pollen in a handy vessel and could press it on to the stigma of the other. Judgment must be used as to the time to transfer the pollen. Open the bud in the early morning, and perhaps by nine or ten o'clock it is sufficiently advanced.

It may be that in this country the results will compare unfavorably with Eckford's, but further experiments are worth making. Great possibilities are in this beautiful and fragrant flower. Who will get the first real yellow Sweet Pea?

Ellington, Conn. *W. T. Hutchins.*

Correspondence.

Gardening on the Shores of Buzzards Bay.

To the Editor of Garden and Forest:

Sir,—It may be well to state, for the benefit of those persons who have an inaccurate idea of the situation of Buzzards Bay, or a mistaken or vague idea of the character of the country about it, that the bay is, in shape, like a horseshoe. It opens on the ocean only to the south. The butt of Cape Cod forms the north-east and east side, and lies between the bay and the Atlantic. The land hereabout is not a level waste of drifting white sand; it is, on the contrary, a rolling country, rising to considerable heights, mostly covered with wood, and full of lakes, ponds and brooks. It offers to lovers of gardening—who are but beginning to appreciate it—great advantages over those undertaking the art in most other parts of our country; and one who is familiar with it foresees that the number and beauty of its cultivated grounds, and the variety and rarity of the trees, shrubs and flowers to be found in them, will one day make it famous.

This land of promise, like England, Japan and the shores of Puget Sound, lies near a warm ocean current, which regulates the temperature and modifies the extremes of heat and cold, and no other part of our country, except the Pacific coast, has so equable a temperature and so great a rainfall; while, besides innumerable lakes, ponds and brooks, inexhaustible supplies of water may be had from underground.

It is true that much—though by no means all—of the soil is poor. Sometimes it is of sand and nothing else; but meadows, pockets of loam, and large muck-beds furnish plenty of other material. Where soil is lacking it can be made or imported, if need be, but climate and rainfall can neither be produced nor bought. Besides, sand is a much better basis than either gravel or clay, and is a most useful, often an essential, constituent; and without admixture of any other soil will convey to a plant all the artificial food that may be supplied. The loss of nutriment by leaching through sand is a theory with the weight of evidence against it.

That the neighborhood—indeed, the whole of Cape Cod and Nantucket—was once covered with noble trees, is matter of record; that it will and does now support such is matter of demonstration; for within a short drive of Wareham are hundreds of acres of tall forest, containing scores of tall trees, giving convincing proof of the capability of the soil. The Atlantic coast of Massachusetts is not fended from the cold northerly winds from seaward; but here the Cape intervenes, and the wooded shores of Buzzards Bay afford a local protection which is invaluable. Here are found, then, the best climate, the maximum of water-supply and shelter, and we have soil, or the means of making it.

The aim of good taste should doubtless be to choose, for the purpose of giving pleasure, only those trees and shrubs that grow cheerfully and thrive; and while great variety and rare specimens add much to the interest of a collection, experiments with doubtful exotics are inconsistent with that sense of rest, harmony and gladness which one would wish to produce in a natural garden. At the same time, it cannot be denied that there is a fascination in trying these experiments; nor can it be denied that English gardens, for instance, have a quality which we can never get, because we have not the plants that furnish them so richly.

Even here, on and about Buzzards Bay, I doubt if the English Laurel—which is a necessary part, singly and in masses, of every cottage-yard and every lawn in England—can be left in the ground the year round. The fantastic Chili Pine, which there breaks the sky-line so picturesquely, and emphasizes the quiet order of the garden, probably cannot, but the English Holly and the Cedar of Lebanon, on the other hand, undoubtedly can, for both have survived more than one winter and summer here; so has, indeed, the Exmouth Magnolia, the most brilliant in leaf of any of them, but it is not thrifty. About Boston even the American Holly is grown always with difficulty, and rarely with success; here it is native, and is delightful in the vigor of its green when other leaves are gone, and in its brilliant decoration of scarlet berries.

Here two most beautiful and much-neglected trees, the Tupelo and Sassafras, are in their own home. A real Tupelo cannot be had from a nursery—a nursery-bred tree has neither character nor foliage. The only way is to choose in some pasture or upland an orthodox-looking Tupelo, not over-large—one that has decidedly a look and way of its own—and then, with a long-bladed narrow post spade, to cut a circle round the tree, severing every root on the way, and to drive the spade through under the tree, dividing the down-going roots as well. Wait a year, and then in the spring move your tree. Let the new hole be dug four feet deep, even though the same soil is replaced; fertilize it liberally, for which purpose wood-ashes are excellent; and by and by you will have a tree of some interesting and beautiful shape, covered with more leaves than can be found in the same space on any tree, each leaf as rich in color and lustrous as that of an English Holly, and the whole tree in autumn a jewel of deep and brilliant color.

The Sassafras, with the liveliness given by fresh color and variety in the form and motion of the leaves, is a charming tree all summer; and, as every one knows, its leaves turn with great beauty in the autumn. It may adopt, or be made to adopt, other forms than that of a succession of parasol-like layers of leaves on a slender trunk, which is its natural habit. If cut down close, it will sprout into a bush; suckers will appear on every side until a thicket appears, rising everywhere to the middle, a natural bit of artificial work; or, again, a good-sized stem may be cut five or six feet from the ground, and the tree forced to grow so freely that the branches droop and the whole becomes a pile of charming foliage, and a mass of glowing color later.

Returning again to the advantages of the place, there are many trees and shrubs more or less useful, more or less doubtful, elsewhere in Massachusetts, which may be counted upon here. Among these are the Sweet Gum, with its star-shaped leaves that keep their color and freshness long into and often beyond October; and even then keeps many that are green as a setting for the crimson-maroon and golden-yellow of the rest. The Hollies, the ever-green sweet-scented Magnolia glauca, the Irish Yew and Juniper, the Golden Yew, the Cypress, all the Retinisporas, are thrifty here; and I am told by a most trustworthy person that there is a Live Oak of considerable size, of many years' standing and in good health, near Kingston.

Many of the ornamental evergreens which elsewhere must be stored in the pit, or, if left out, are made ragged with frost-bites and brown patches, appear here after the winter in perfect condition, with no protection except perhaps mulching; so do, of course, Rhododendrons and Mountain Laurel, which flourish greatly.

With such advantages, may one not look forward confidently to the fulfillment of a belief that this will become a region of delight to the lover of landscape-gardening?

Boston, Mass. *Wm. Minot, Jr.*

Pitch Pine from Seed.

To the Editor of Garden and Forest:

Sir,—A large field, worthless for cultivation, almost pure sand, in places a little loamy, is growing up with Bayberry, Sweet Fern and Golden-rod. Would seeds of *Pinus rigida* catch here, and if so, how should they be sown, or is there any chance of success in using other tree-seeds, and if so, what sorts—either deciduous or evergreen? Expense is very much to be considered.

Providence, R. I. *Bayberry.*

[Such land as our correspondent describes will quickly produce a crop of Pitch Pine (*Pinus rigida*); but it often possesses more plant-food than its natural plant-covering would indicate, and such land will often grow White Pines, Oaks and Chestnuts of a considerable size and value, as the plantations made in East Greenwich, Rhode Island, by Mr. Henry G. Russell demonstrate. The best way to plant Pitch Pine is to sow the seed in the spring with an ordinary seed-sower in shallow furrows four or five feet apart each way; but, as the surface of this particular piece of ground is already more or less covered with dwarf shrubs and other plants, it would be cheaper to scatter the seed broadcast over the surface and take the chance of a sufficient number germinating to cover the ground with plants. White Pines are best transplanted when ten or twelve inches high. It is a good plan to plant acorns of the White, Red and Black Oaks and Chestnuts among young Pines, to replace these in case they are destroyed by fire or other causes, or to take their place after the Pines are cut. The seeds of such deciduous trees can be quickly and cheaply planted in holes an inch or two deep, made with an ordinary walking-stick. The holes, after the seeds have been dropped in, should be covered by a pressure from the foot, which will make the soil compact over them. The seedling Oaks and Chestnuts will exist for years under the dense shade of the Pines, and will grow rapidly as soon as light and air are admitted to them.—Ed.]

Recent Publications.

The relation of electric light to vegetation is a subject of interest to horticulturists, both from a scientific and economical standpoint, and therefore we are glad to see in Bulletin No. 30, of the Cornell Experiment Station, an account of what Professor Bailey accurately calls "Preliminary Studies of the Influence of the Electric Arc Lamp upon Greenhouse Plants." The bulletin contains some forty pages, and therefore we are able to give only a condensed account of the methods employed and the conclusions reached.

A forcing-house, twenty feet by sixty, was divided into equal portions by a partition, one of which was left under ordinary conditions of sunlight during the day and darkness at night. The other had sunlight during the day, and in the first series of experiments an electric light was suspended from the peak of the house, which was run all night from dusk to daylight. The same kind of vegetables were planted in each compartment, and, as a rule, the general effect of the electric light was to hasten maturity, and this acceleration was greater as the plants were nearer to the light. This tendency was particularly marked in Endive, Spinach, Cress and Lettuce, so-called "leaf-plants." They ran to seed before edible leaves were formed, and the leaves of those near the light were small and curled. The Spinach under electric light matured good seeds, while that in the dark house was still making large edible leaves with no indication of flower-stalks. The microscope showed that there was apparently the same amount of starch in the plants of each compartment, though the starch-grains of the plants under the electric light were larger, had more distinct marking and gave a better color-test—that is, they seemed more perfectly developed than in the others. Lettuce behaved in the same way, most of the plants being killed outright for three feet on either side of the lamp soon after they came up, and the plants which survived were seriously injured, the leaves being curled and small. The plants increased in stature and vigor and size of the leaves as they were at greater distances from the lamp, and those nearest the lamp made the most of their leaves early in their growth. The plants at five weeks all ranged from a little more than one inch to a trifle over two inches high, while the average height of the plants in the dark house was two and one-quarter inches, and they were much more vigorous and had larger and darker leaves. In two varieties of Cress the plants under the electric light were in bloom although they were small and sickly, while those in the dark house were strong and vigorous, with good leaves and no blossoms. Endive gave practically the same results. It chanced that two rows of plants were parallel to each other in the lighted house, but one was shaded by an iron post only an inch and a half in diameter, while the other stood in the full rays from the arc. Two months after planting, the average weight of the plants in full light was about fifty grains, and that of the plants in the shade of the post was ninety-four grains, while the average plant in the dark house of the same age weighed 575 grains, and had larger leaves and of a better color than those grown in the other apartment. Young Radish-plants seemed strongly attracted by the electric light, and in the morning they all leaned at an angle of from sixty to forty-five degrees toward the lamp. During the day-time they all would straighten up again, but would reach out for the lamp on the succeeding night, and this was repeated until the roots began to swell and the plants became stiff. When the Radishes were large enough to market, the entire plants in the light house were lighter by nearly half than those in the other compartment, while the tubers were lighter by more than fifty per cent., and there were three times as many of these large enough for market in the dark house as there were in the light house. All these results are made very striking in the bulletin by reproductions of photographs, which show clearly the differences, while chemical analysis showed that plants under the electric light had reached a greater degree of maturity than those under normal conditions.

Altogether it was plain that the plants in the lighted house were injured, and the question was, whether this was due to the quality of the electric light or to the fact that the plants were in continuous light during the entire twenty-four hours. To settle this point some plants were covered during the day so as to receive no sunlight, although they were well ventilated, and the covers were removed so that they could receive electric light for twelve hours during the night. But under these conditions Radishes made but a sickly growth, assumed a faint green color, and died within three or four weeks. An experiment of the same character was now conducted on a larger scale when the hours of sunlight were about equal to those of electric light, and the plants were shaded, not completely, but only from the direct rays of the sun, so that they could receive diffused light. They quickly died. Lettuce, Beans, Corn and Potatoes repeated the same lesson. Plants which had already been well started behaved in the same manner, so that it seems to be established that, within the range of an ordinary forcing-house, a naked arc-light running through the night is injurious to some plants, and that it was not found profitable in any case.

The fact, however, that the light hastened maturity or seed-bearing suggested that some modification of the light might be useful under certain conditions, and, therefore, an experiment was made with a protected light running through the night; that is, a white opal globe was placed over the lamp, and, for five weeks, experiments similar to those formerly described were carried on. The effect of this modified light was much less marked than that of a naked light, the plants showed less tendency to run to seed, and were not so much affected by proximity to it. Lettuce, however, was decidedly better under the shaded electric light. This fact that the Lettuce, as well as the leaves of Radishes, grew larger under the subdued light than in ordinary conditions, indicated that there might be conditions under which artificial light could be made profitable to the gardener, and therefore an experiment was made, during the early part of the present year, with the naked light running for a portion of the night only. The house was arranged as before, but the lamp was connected with the street-lighting system, so that it never ran on moonlight nights, and only for a few hours on dark nights. Under these conditions Lettuce was greatly benefited. The plants were fit to market two weeks earlier in the lighted compartment than they were in the other. They were on the benches only forty-four days before the first heads were fit to sell, and during this time there were twenty nights in which the electric light had not been run, and during the whole time there had been but eighty-four hours of electric light, which

would cost about $3.50. It was not known how far the influence of this light would extend, but it was noteworthy that the results were as well marked in the most remote parts of the house as they were near the lamp.

These results suggest many questions which can only be answered by further trials. We need to know whether there is any particular time in the life of the Lettuce-plant when electric light has a predominating influence; whether a mild light is as good as a strong one; whether the failure of the light during moonlight nights is a drawback; to what distance the influence of the light extends; whether the same results can be obtained by hanging a lamp over the house as inside of it, so that several houses could be lighted at once; and whether any other plants can be profitably forced by electric light.

Experiments with ornamental plants showed that the influence of light upon the productiveness and color of the flowers varied with different species and different colors of the same species, and that there is usually a perceptible gain in earliness under the lamp, so that on the whole it seems possible that electric light can be used to pecuniary advantage in floriculture.

The second part of the bulletin gives an account of the experiments tried elsewhere, commencing with some made by Hervé-Mangon thirty years ago, and including those of Dr. Siemens, which have been published in the *Proceedings of the Royal Horticultural Society*, and of Dehérain's tests conducted at the Exposition d'Électricité, which were published in the *Annales Agronomiques*, vii., 551.

In conclusion, it appears, from the many conflicting and indefinite results so far obtained, that the problems to be solved vary widely under different conditions and with different plants. The points made clear are: The electric light promotes assimilation, and often hastens growth and maturity; is capable of producing natural flavors and colors in fruits; often intensifies colors of flowers, and sometimes increases the production of flowers. Since it is found that periods of darkness are not necessary to the development of plants, there is every reason to suppose that the electric light can profitably be used in growing them. It will be necessary, however, to overcome the injurious influences which this light exerts upon plants too near it and the too rapid maturing of some species—in short, a whole series of practical adjustments of conditions to individual circumstances is required. So far, we have learned more of the injurious effects of the light than of the beneficial ones, but this means simply that we are learning definite facts concerning the influence of the electric light upon vegetation, and in some cases, especially in the Lettuce tests carried on at Cornell, this has already been found a useful adjunct to a forcing establishment. Professor Bailey concludes this highly interesting and instructive bulletin as follows:

"The experiments suggest many physiological speculations upon which it is not the province of this bulletin to enter. Yet two or three of them may be mentioned. It is a common notion that plants need rest at night, but this is not true, in the sense in which animals need rest. Plants have simply adapted themselves to the conditions of alternating light and darkness, and during the day they assimilate or make their food, and during the night, when, perforce, assimilation must cease, they use the food in growth. They simply practice an individual division of labor. There is no inherent reason why plants cannot grow in full light, and, in fact, it is well known that they do grow then, although the greater part of growth is usually performed at night. If light is continuous they simply grow more or less continuously, as conditions require, as they do in the long days of the arctic regions, or as our plants did under continuous light. There is no such thing as a plant becoming worn out or tired out because of the stimulating influence of continuous light.

"It would seem, therefore, that if the electric light enables plants to assimilate during the night, and does not interfere with growth, it must produce plants of great size and marked precocity. But there are other conditions, not yet understood, which must be studied. Our Radish-plants, and many others, were earlier, but smaller, under the influence of the light. Observation and chemical examination showed that a greater degree of maturity had been attained. Perhaps they assimilated too rapidly; perhaps the functions of the plant had been completed before it had had time to make its accustomed growth. Perhaps the highly refrangible and invisible rays from the electric lamp have something to do with it. In fact, this latter presumption probably accounts for much, if not all, of the injury resulting from the use of the naked light, for the effect of the interposition of a clear pane of glass is probably to absorb or obstruct these rays of high refrangibility. Good results which follow the use of a globe or a pane of glass show, on the other hand, that the injury to plants cannot result from any gases arising from the lamp itself, as has been supposed by some observers. In our own experiments, particularly with the Brush lamp, there was no perceptible odor from the gases of combustion; and it may also be said that commercial forcing-houses, like our own, are not tight enough to hold sufficient quantities of these gases to injure plants.

"It is highly probable that there are certain times in the life of the plant when the electric light will prove to be particularly helpful. Many experiments show that injury follows its use at that critical time when the plantlet is losing its support from the seed and is beginning to shift for itself, and other experiments show that good results follow its later use. This latter point appears to be contradicted by Dehérain's results, but his experiments were not conducted under the best normal conditions.

"On the whole, I am inclined toward Siemens' view, that there is a future for electro-horticulture."

Periodical Literature.

The mid-August issue of the *Revue Horticole* describes the interesting and important discovery of a French entomologist, Monsieur Lemould, who has devised the means of destroying the larvæ of the Hanneton, the insect which in this country is known as the May-bug or Dor-bug, and which for years has done a serious injury to agriculture and horticulture in France and in this country also. Monsieur Lemould has been studying a cryptogamic plant parasite on the larvæ of the Hanneton, and has been experimenting with it at Céaucé, where he found a field so infested with the white grubs, as these larvæ are usually called here, that the sod could be lifted with the hand. About ten per cent. of the grubs was dead, their bodies being covered with a white moss-like cryptogamic growth. The dead were placed in contact with healthy grubs, and these at the end of a couple of weeks had all contracted the disease. Two months later the spread of the parasite had made enormous progress, the affected grubs amounting to from sixty to seventy per cent. of the whole number left alive in the field.

On the 25th of last July Messrs. Prillieux and Delacroix communicated to the Academy of Science the result of their experiments on the destruction of white grubs by the aid of *Botrytis tenella*, a minute cryptogam, whose spores propagate with prodigious rapidity, and which they had cultivated in the following manner: A large crockery dish was set in a cool, shady place and filled with a thin layer of moist sand. Upon the sand were placed one hundred white grubs, and these were covered with the spores of the plant reduced to powder. A covering of damp moss was then placed over the grubs, and the whole was covered with boards. In six or seven hours the grubs were infected, and were then planted in an infested field. The disease spread rapidly, and at the end of a few months destroyed all the grubs, which died by myriads.

The practical results of these experiments are assured, it appears, and this new insecticide can be purchased from certain French chemists, who are prepared to deliver tubes filled with it similar to tubes of vaccine. "We cannot foretell yet," the editors of the *Revue* remark, "what results this discovery will have for our agriculture or say that if its employment is easy, practical and cheap, it will enable our agriculturists to fight a pest which ravages whole regions, as was seen three years ago in the departments of Mayenne and of Orne, but it seems, at least, that it is capable of rendering immense services to horticulture."

The July number of *Pharmaceutische Rundschau* contains an instructive article on the alleged poisonous properties of the Wild Parsnip, that is, the common garden Parsnip, *Pastinaca sativa*, when it has run wild. It is stated in Dunglison's Medical Dictionary that this is an irritant poison, and this is a widespread popular belief. Dr. Frederick Power, however, read a paper before the Wisconsin State Medical Society last June, in which he gives the result of his investigation of several cases of what was said to be poisoning by the Wild Parsnip, which he had seen reported in the papers. In every case where fatal effects occurred it was found that the root eaten was not the Parsnip but *Cicuta maculata*, a plant which belongs to the same family, and is known under the common names of Spotted Cowbane, Musquash Root and Water Hemlock. So far as Dr. Power's investigations go, the wild Garden Parsnip is not at all poisonous when taken, either in a raw state or when cooked. Since this root of Cicuta is most frequently taken for the wild Parsnip, and since such mistakes are often attended with fatal results, the distinguishing characters of the two roots are given. *Cicuta maculata* has

an oblong thick fleshy root-stock, or a fascicle of fleshy tubers, which sends out several strong light-colored rootlets in a horizontal direction. The interior of the root is nearly white, and contains one or more cavities formed by the absorption of the tissue, and these cavities, which form one of the special and most important characteristics of the Cicuta root, may be easily seen when it is cut longitudinally through the centre. The root, when cut in this way, exudes drops of a yellow resinous juice which possesses a strongly aromatic odor closely resembling that of the Parsnip. The taste is at first sweetish, but afterward sharp and acrid. Cuts of the two roots are reproduced from Dr. Power's paper, in which their individual characters are very plainly seen.

Notes.

The first elementary work on botany published in this country bore date 1803, and was written by Professor D. S. Barton. The systematic teaching of botany in American schools seems not to have begun until some twenty years later.

Professor Goodale has commenced the publication in the *American Journal of Science* of a series of short sketches of the botanic gardens in the equatorial belt and in the south seas, which he has visited in his recent journey around the world.

At its recent meeting in Washington the Association of Agricultural Colleges and Experiment Stations passed a resolution urging the Secretary of Agriculture to do what he could to secure the passage of a law or laws for the preservation of the public forests.

Several of the large Palms in Horticultural Hall, Fairmount Park, have been fruiting freely this season. Among them are three or four specimens of *Seaforthia elegans*, and the long drooping branchlets of the flower-clusters are studded with fruits of various colors, from olive-green to dull red, according to their degree of ripeness. *Thrinax elegans* has also produced an abundant crop of seeds in the same establishment.

Flower-beds arranged geometrically are not always to be commended, but a circular bed filled with succulents seems to attract more attention than any among the large number of beds in Fairmount Park, Philadelphia, this season. The bed is between twenty-five and thirty feet in diameter, and special care has been taken in arranging the thousands of plants it contains with due regard to their individual forms and colors.

Mr. C. L. Allen says, in the *American Agriculturist*, that in cultivating the Amaryllis the most common mistakes are (1) the use of too large pots, (2) the too deep planting of the bulbs, and (3) too frequent shifting. As a rule, the bulbs should not be more than half-covered with soil, and they should not be shifted until the pots are filled with roots, and then they should be placed, while resting, in pots only one size larger than those they were occupying.

It is observed by many persons in the east that the California pears, which are so plentiful this year, are better-flavored than in former years, although they are somewhat smaller. This change is attributed to the fact that the California fruit-growers no longer keep their orchards irrigated up to the time when the fruit ripens, but shut off the water when the pears are well grown, so that they are permitted to ripen in the California sun and wind without the aid of artificial moisture.

The value of our native *Viburnum cassinoides* has often been insisted on in these columns. At this season of the year no hardy shrub, whether in flower or in fruit, equals it in beauty. The fruit is now bright pink, although in many of the clusters some of the berries are flesh-colored, and others have already assumed the dark blue of their maturity. The contrast of the colors of the different berries among themselves and with the large and lustrous leaves is beautiful. This inhabitant of our northern swamps takes kindly to cultivation, and is worthy of a place in any garden.

The common Stramonium, or Thorn-apple (*Datura Stramonium*), is, in some parts of New England, generally called "Jamestown-weed," or, by elision, "Jimson-weed." This name, says a recent writer in the *Atlantic Monthly*, sprang from the fact that the plant, which was medicinally esteemed, had been brought over by the Jamestown colonists and "spread miraculously" from the place of its first establishment. At an early date it had become so troublesome in the New Haven colony that a law was passed to enforce its destruction as "a great, stinking, poisonous weed."

Every year there is a more general appreciation of the truth that public pleasure-grounds are indispensable to every urban community where the health and happiness of its citizens are considered worthy of attention. The last legislature of Pennsylvania recognized the tendency of public sentiment in this matter by passing a law to enable the various cities of that commonwealth to acquire lands for park purposes. It authorizes all cities in Pennsylvania to purchase and hold ground for such purpose, and empowers the councils of such cities to enact ordinances for the purchase, improvement, management and control of such ground; to enforce said ordinances by proper penalties; and to make appropriations for the payment of property acquired under authority of this act.

The botanists who attended the meetings of the American Association for the Advancement of Science at Washington last month were each presented with a neat little hand-book, entitled "The Trees of Washington," which had been prepared by Geo. B. Sudworth, Botanist, and B. E. Fernow, Chief of the Forestry Division. It contains a list of all the trees in the grounds of the city, with numbers to indicate the park in which specimens are to be found. The grounds containing the greatest variety are represented by plans, with a list of the species of trees there found and the location of the individual trees indicated. The different parks and grounds of the capital contain many interesting trees which are overlooked for lack of such a guide, and this list, with the accompanying plans, will prove acceptable to many other visitors, as they did, no doubt, to the Botanical Club for whom it was prepared as a souvenir.

A letter from the Acting Chief of the Department of Horticulture of the World's Columbian Exposition informs us that the building for the horticultural department, which is to be located immediately south of the entrance to Jackson Park, in the main portion of the World's Fair Grounds, will be 1,000 feet long, with an extreme width of 286 feet. The plan embraces a central pavilion, with two end pavilions, each connected with the centre by front and rear curtains, which form two interior courts, each 270 x 88 feet. These courts are to be decorated in color and to be planted with ornamental shrubs and flowers. The central pavilion is to be covered by a dome 187 feet in diameter and 113 feet from the ground, under which it is proposed to exhibit tall Palms, Bamboos and Tree Ferns. The contracts for the building have been let, the estimated cost being $400,000. We are told that the horticultural exhibition is to excel anything heretofore attempted.

Mr. J. J. Willis, who superintends the experiments of Sir John Bennet Lawes, says that it is now admitted at Rothamsted that free nitrogen from the air is fixed in the growth of some leguminous crops under the influence of suitable microbe infection and the development of nodules on the roots of the plants. How this fixation is brought about is yet unknown. Dr. Gilbert does not believe that the plant accomplishes this through its leaves, nor that the microbes do the work in the soil so that the roots can take up the nitrogen compounds, but that the nitrogen, by the aid of the organisms, is fixed in the root-nodules, and from thence absorbed and utilized by the last. Among many interesting queries suggested by this now recognized fact, is one as to the cause of "Clover sickness." Experience has shown that clover, in many cases, cannot be grown by ordinary methods on lands where it once flourished. Is this because of the absence of the microbes which help to form the nodules and fix the nitrogen?

In a recent quarterly number of the *Journal of American Folk-lore* reference is made to a paper called "Popular Names of American Plants," which was read at a meeting of the Boston Association of the American Folk-lore Society last spring by Mrs. F. D. Bergen. This lady is desirous of completing a collection of such names, and, says the Journal, "as the interest and value of a good collection of popular plant-names is obvious, it is very desirable that persons who may be able and willing to contribute should send their material to Mrs. Bergen, Cambridge, Massachusetts," or else to the editor of the Journal itself. In connection with this notice is printed a letter from a resident of Massachusetts, in which are cited scores of popular plant-names current in various parts of New England at the time when the writer was a child, and which includes many that seem unfamiliar to-day. One of the most curious is Election Pink, applied to *Rhododendron nudiflorum*, "because in bloom at the old-time 'election' when the governor took his seat"; and another is Heart's-ease, since it was applied, not to the Pansy, but to *Polygonum Persicaria*, more commonly called Lady's-thumb. A pretty term was Baby-feet for *Polygala paucifolia*, and another for *Arisæma triphyllum*, which New England children now call Jack-in-the-pulpit, was Lady-in-a-chaise.

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The Possibilities of Economic Horticulture.

"SOME of the Possibilities of Economical Botany" was the subject selected by Professor Goodale for his valedictory address as President of the Association for the Advancement of Science, and it is one of exceptional interest. An attractive field of speculation opens before us at once as we begin to inquire what plants the coming man will use for food and forage, for timber and tanning, for fibre and cordage, for perfumes and flavors and medicines. This is especially true when we are reminded that of the more than one hundred and ten thousand species of flowering plants known to exist on the globe, scarcely one per cent. are utilized to any considerable extent by man. If we include the Ferns, Mosses and Liverworts, the Algæ, Fungi and Lichens, the percentage of utilized plants will be much smaller still. The questions discussed by Professor Goodale were: How can this short list of useful plants be increased to advantage? What likelihood is there that our future food-supply will include other vegetables, fruits and cereals than those we now use? Will new fibres replace those we now spin and weave? Will new remedial agents be discovered among plants now unknown or neglected?

Omitting a consideration of the cereals we find that the plants which would be more strictly classed as horticultural have undergone remarkable transformations under cultivation. Wild Cabbage, a tall perennial weed of open growth, shows to the unscientific observer scarcely any likeness to the garden forms with which he is familiar. The largely developed leaves of some of these forms are imbricated and overlapped into a compact spherical, conical or flattened head; others, like Borecole and Kale, have branching leaves; in some, like Broccoli and Cauliflower, the flower-stems have been transformed into fleshy edible masses; in others, as in the Kohl-Rabi and Turnip-rooted Cabbage, the stem or root has been developed into a large ball, and there are others still with modifications in the ribs of the leaves or in the axils of the shoots, or in several organs together, to produce such varieties as Brussels Sprouts, the Marrow Kales and many more. The Cabbages have been cultivated since the earliest historic time, and no one knows how many years of selection have been needed to produce these striking morphological changes. But the Tomato is younger as a garden-plant. It is a native of America, but, although cultivated more than three centuries ago in Europe, it has come into general use only within the memory of men still living. It is not unreasonable, therefore, to suppose that there are many garden-plants now used only to a limited extent which merit a wider employment, and which we may hope can be developed into much wider use. Professor Goodale names some of these, and he also suggests that we may expect to obtain from Japan, for example, whose flora is closely related to our own, many other vegetables which are already used there. Dr. Curtis, of North Carolina, has suggested that we have in the unutilized Mushrooms an immense amount of available food of delicious quality, and we may add that researches now in progress at the Experiment Station of Indiana prove that many other Fungi furnish nutriment of the best quality, and that they can be largely improved by careful selection.

The improvement which has been made in oranges, pears, apples and other fruits, within historic time, suggests that there is an opportunity for much further development, and Professor Goodale adds that there is no reason why we should not have strawberries without seeds, blackberries and raspberries with only delicious pulp, and large grapes as free from seeds as the small ones which we call currants, but which are really grapes from Corinth. Coreless apples and pears, stoneless cherries and plums, must be propagated by bud division, it is true, but bananas and pine-apples have been propagated in this way for centuries. Then, many of our wild fruits are promising subjects for selection and cultivation. The common Blueberry and its allies are, no doubt, worth trying to improve, and so is the Juneberry and others. The eastern coast of Asia will, beyond question, add largely to our future fruits, and it cannot be long before the list is considerably increased. Professor Goodale went further, and discussed the probability of new timbers and cabinet woods, new vegetable fibres and tanning materials, new resins and new plants for fragrance and flowers, and spoke of the need of systematically investigating plants of promise under the most exhaustive conditions. When our botanical gardens, museums and laboratories of economic botany, as well as our experiment stations, work together, with the co-operation of all persons interested in scientific matters in the domain of commercial and industrial botany, we may reasonably hope for discoveries of immediate and growing importance.

But there are possibilities of horticulture in other directions which are well worth considering. As increasing population presses upon the world's food-supply it is a matter of interest to know to what extent the productive powers of the earth can be increased. As new fruits and vegetables are brought into use we ought to be learning how to obtain the greatest quantity from a given area within a given time, and with a given outlay of labor and expense. Even now the difference between the amount of wild fruit which an acre will naturally yield and the amount of the same fruit which an equal area, carefully prepared, will yield under cultivation is enormous. An acre of wild Cranberry-vines, fighting for life with the other vegetation in a swamp, would give but a few bushels at most, and these could only be gathered at considerable trouble; but on the leveled and sanded bogs of Cape Cod the uniformly loaded vines on a single acre have yielded a hundred and fifty barrels, and even more, of choice fruit, or a barrel of berries to every square rod. This is accomplished by thorough preparation, sleepless care, clean cul-

ture and the proper use of fertilizers. The market-gardeners about Paris are able to pay $125 a year rent for an acre of land and yet make a good living. A thousand bushels of potatoes to the acre can hardly be counted an impossible crop in this country, even with our present knowledge, and in the island of Jersey the money returns from a glass-covered garden of thirteen acres exceed those of an English farm of thirteen hundred acres.

But it is not reasonable to assume that the best crops which can be produced with our present knowledge illustrate the maximum productiveness of the soil. As we learn more of the laws which govern the growth of plants we ought to be able to supply conditions more and more favorable to the highest success. We have much to learn, for example, of the relation of light to plant-growth. Experiments at Cornell University have shown that Lettuce, by the use of an electric light, can be forced to sufficient maturity for table use in six weeks from planting, while eight weeks are required to grow plants to the same size without the light. There is little doubt that further experiments will prove that artificial light can be used to still better advantage in many cases. The French market-gardeners have already found it profitable to warm the soil by hot-water pipes, and this indicates another direction in which, especially when glazed sashes are used to cover the ground, vegetation can be hastened, and additional crops secured from the same land every year. Sub-irrigation, especially with diluted sewage, has multiplied production enormously in the neighborhood of some European and American cities, and the systematic use of this waste matter is yet in its infancy. The mines of Stassfurt and the rocks of South Carolina are already furnishing potash salts and phosphates at small expense, and new discoveries may render these elements of plant-food cheaper still. Nitrogen is yet expensive, but when some economical method is discovered of collecting it in available form from the limitless supply of that material in the air, garden-crops can be cheaply fed with all the nutriment they are able to assimilate. It has long been known that microscopic plants do an important work in the soil in preparing food which plants can take up and digest, and these organized ferments will, no doubt, in time become articles of commerce supplied by special breeding establishments.

Altogether, we may hope, without presumption, that, in the times next ensuing, our improved fruits and vegetables, as well as plants for ornament, can be grown more rapidly, more abundantly and more cheaply. Increased knowledge now enables us to hold in check plant-diseases and injurious insects, before which we were powerless a few years ago. Recent progress in the science and art of gardening justifies the belief that study and experience will in like degree increase our knowledge of the relation of light and heat and moisture, as well as of the mechanical and chemical constitution of the soil to the development of plants, and we shall devise means of controlling these conditions more perfectly and of adapting them more intelligently to horticulture as a business and as a diversion.

Monuments in Public Places.—IV.

ANOTHER important question in the out-door placing of works of sculpture is whether they shall be seen from every side, or from one or two sides only. A figure or group not specially designed for a given spot is, of course, most beautiful when, as we walk around it, each step reveals new beauties of line and mass; and great injustice is done alike to the artist and the public if such a work is set where only one aspect can be appreciated. But, on the other hand, it is unfair to artist and public if a work that looks its best from one side only (and very likely has been designed simply to be thus beheld) is stationed so that the back will be as clearly seen as the front. We can thus imagine works which would be very unfairly treated if placed along the Mall in the Central Park, as here their backs could be seen only if a forbidden walk on the grass were taken; but there are many others to which, for the same reason, a place like the Mall offers the kindest possible hospitality. In general, seated statues are eminently well fitted for such a place as this, as their backs can seldom be given any strong quality of interest.

This question of desirable points of view is even more imperative than the question of scale in prescribing that, when a definite commission is given for a monument, the artist should know in advance just where it will stand; he can then decide whether he must consider all of its aspects with equal care, or may subordinate some to concentrate his attention on the one that will be of primary importance. Such subordination, by the way, even if it amount to total sacrifice, is a perfectly lawful and laudable exercise of the artistic prerogative. There is no more reason why the back of a statue standing out-doors should be as beautiful as the front if the back will never be clearly seen, as why similar care should be bestowed upon one that is to be fixed in a niche in a wall, or upon the groups of a pediment. If, when a statue is ordered, the sculptor is not told just where it will stand, then upon its completion he, and no other, should choose its place; but, of course, in view of the possibility that no thoroughly good site may present itself, it is always best that the question of site should be a preliminary one.

Works of sculpture, or of architecture and sculpture combined, are just as appropriate to a pleasure-ground when their value is simply artistic as when they are monumental, historic in character. Indeed, as the chance that a high degree of beauty will be secured is greater in such works than in commemorative ones, it is especially desirable, for the sake of the public's pleasure and the development of its taste, that these should be the ones generally placed in our parks. When they are concerned the question of site will almost always arise after the artist has finished his work; but it should be as carefully considered as with regard to portrait statues, and likewise their pedestals should be as carefully designed. For neither class of objects is a simple, plain base always the best; and nothing less than the best should ever satisfy us in constructions of so permanent a sort.

It would be well, too, if those who give non-commemorative works of art to our parks would intelligently consider what special kinds are fitted for such service. Of course, no general rule can be laid down; but we may say that, broadly speaking, a statue or group for out-door placing is best when it has a definite out-door character itself. The Falconer in the Central Park, to which we have already referred, is, in idea, an excellent out-door figure, and so is Mr. Ward's Indian Hunter; while the group called Auld Lang Syne seems to cry out for a roof above its head, and no one would care to see under the open sky a figure, for example, of a mother rocking her baby to sleep. Questions of exact placing, moreover, are involved in the general question of appropriateness. Ward's Indian Hunter looks well standing on the edge of the road under a spreading tree; but a portrait-statue would look badly there, and very badly, indeed, perched on the rocky slope where we can see the Falconer without strong objection. In certain retired nooks, provided some other formal elements were present to sustain their own artificial character, we can fancy little groups of animals or figures of a rustic character looking well, though a commemorative bust or figure would seem sadly out of place.

For obvious reasons, it is less easy to give the right out-door look to a seated statue, even of a purely commemorative kind, than to a standing or mounted figure; but such a one might look better in portions of a park, where people sit at rest and the idea of repose is prominent, than in a city's streets. Seward, poising his pen on the corner of Madison Square, looks sadly out of place, and many travelers must have noticed in London the almost comically inappropriate air of the seated figure of George Peabody surrounded by the rush and clamor of the busy city. Sometimes the architect might well be called in to

the aid of a seated statue, to furnish not merely a fitting base, but some sort of a canopy or roof which will mitigate the impression that it ought not to be out-of-doors. It would be interesting to know just how the Greeks and Romans treated this question of seated statues; it almost seems that they must have preferred to place them under porches or colonnades rather than boldly beneath the sky; but, in any case, our climate is not the climate of Greece, and a statue sitting placidly with its lap full of snow does not produce a very fortunate effect.

Finally, the question of treating the ground around the base of a monument should be given due attention. The equestrian statue of Washington in the Public Garden at Boston is excellently placed, near the boundary of the pleasure-ground at the intersection of its main paths. But, this summer at least, it has had a curiously inappropriate look which, upon examination, was seen to result from the wide bed of tall, ornamental plants encircling its base. The profusion of these plants hid the connection of the pedestal with the soil and thus deprived it of solidity of aspect, while their freely waving leaves had no artistic relation to its rigid lines. Did it rise naked from the smoothly clipped grass it would look much better, but, best of all, if partly draped in a closely clinging vine which would not disguise its form, and, instead of separating it from the ground, would more intimately connect the two. Nothing is more beautiful than the way in which the French use Ivy to drape the pedestals of their open-air statues, and even where these stand, as we think they should not, in the centre of open lawns, the mistake is partly condoned by unifying creepers. So far as we remember, the French never surround a statue with a high growth of foliage-plants or a wide pattern-bed of flowers. The distinction between a right and a wrong method of treatment is here perfectly clear and valid: the vines unite themselves to the monument and unite it to the ground, while the pattern-beds supply a third element which has no vital relationship to either turf or stone. The good effect of vines on pedestals may be studied in a few places in this country also, as on the pedestal of the Webster in the Central Park. One would like to see them planted around the statues on the Mall as well, and, afterward, carefully restrained from undue luxuriance. For such a purpose, we need hardly say, the best possible creeper is the so-called Japanese Ivy, which looks as though nature had invented it to serve the architect's needs. The Ivy is not so certain to prove hardy in our climate, and, though the Ampelopsis loses its foliage in winter, even then its beautiful net-work of delicate branches seems to tie the stones to which it clings to the bosom of mother earth.

Formally clipped plants, growing in simple but handsome pots, would sometimes be appropriate around the base of a monument, especially if it were placed on a terrace; and in certain other cases a plantation of shrubs may be desirable, though rather as a background to the pedestal than encircling it. Such a background is positively needed by the Farragut monument on Madison Square, and was, undoubtedly, contemplated by its makers. It will look much better than it does now when, from the rear, only the figure itself is visible.

When we think of the variety in effect that might be secured to our parks by monuments carefully planned for given situations—as for niches in foundation-walls, for the crowning of balustrades and bridge-parapets, the adornment of drinking-fountains, the completion of rond-points, and the lining of formal avenues—most of what has been already done in these places seems unimaginative and monotonous. The chief trouble has been that we have thought too little of the question of site. When we order a statue we are too indifferent as to where it may go; when we buy one already made, we are too careless in its placing. Whatever thought we have thus far given has been directed to the works themselves; now we should begin to think of them in a wider way, as chances for the architect as well as the sculptor, to give more care to the matter of appropriate and helpful bases, and especially to use the utmost pains and invoke the most skillful help in their eventual placing.

Northern Plants in Pennsylvania.

THAT part of the Appalachian Mountains between the west branch of the Susquehanna and the Juniata, in Pennsylvania, would be thought rather tame and uninteresting by the lover of mountain scenery. Although erosive action has been enormous here, as in other mountain regions, the absence of any but local glacial action has left a surface but little varied. There are no lakes or ponds, and but few and small marshes, while the low mountain-ridges, running north-east by south-west, are frequently so close together as to leave only long narrow valleys, or even none at all.

But the interesting features in any region are always multiplied by search and careful examination, and if extensive surface waters are here unknown, the great springs in the limestone districts and the frequent sinks or disappearance beneath the ground of streams of considerable volume are sure to attract the attention of the traveler and excite his curiosity and interest.

Years ago I was told that somewhere in these mountains ice accumulated so abundantly, and was so well protected from waste, that it remained through the whole year. As time went on, and no such place could be found, it was put down as one of those exaggerations to which new-comers are so often treated. But one day, picking up General Brisbin's "Trees and Tree-planting," this astounding statement was found in the introduction, where the natural features of this very district were being described: "If we turned over a rock in the mountain-side we found ice beneath it even in the hottest days of August." Having turned over a great many rocks on that particular mountain-side, and never having found any ice in August, the whole matter was cast out of mind as useless rubbish, when within a very short time an interesting botanical discovery was made. *Linnæa borealis* was found in a wood which had been under close observation by botanical students for a number of years, and yet I knew of no record that the plant had been seen here before. Running over the back numbers of the *Botanical Gazette* to see if this or other northern plants had been recorded from this part of the state, an interesting note was found (vol. ii., p. 8), from Mr. J. R. Lowrie, of Huntingdon County, in which not only were such species named, but their persistence in a given instance was credited to the perpetual ice which was found among the rocks in late summer about three feet below the surface. The precise locality was named, and visits to it have shown much of botanical interest, besides confirming, in the main, what was said regarding the ice.

Spruce Creek is a small tributary of the Juniata running parallel to Tussey Mountain for several miles. About three miles above its mouth, near Colerain Forge, in Huntingdon County, it cuts close in to the mountain-side, and by wearing away the easily eroded Utica shale has exposed a nearly vertical wall of the overlying Oneida sandstone. For ages this cutting and scouring have been going on until at the base of the wall, and running into the stream itself, lies a heavy talus of broken rock from the undermined cliff. In the interstices of these rocks ice forms readily in great quantity in cold weather, and such is the protection afforded by the sweep of the mountain itself as well as by the cliff, that but little direct sunshine is received, and that only in midsummer. Until then it is only necessary to throw aside a few blocks of stone in order to reach the ice, but as the season advances it retreats further and further until late summer, when it is frequently, probably commonly, so deep that it is inaccessible except by a great deal of labor. But its presence is shown by the low temperature of the rocks and the surrounding air. Bending low in any of these ice-holes one's breath quickly becomes visible, as on a winter's day in the frosty air. No ice could be seen at the date of my last visit, August 28th, but old residents in the vicinity are quite positive that in some years ice has been taken out during the entire season, although it was necessary to dig deep for it during August and September.

While a large part of this talus is completely bare, there are portions of it which support a poor growth of the ordinary trees and shrubs of the vicinity. But near its base are found, particularly, our Mountain Ash (*Pyrus Americana*), Canoe Birch (*Betula papyracea*) and *Ribes prostratum*, none of which are common elsewhere in the neighborhood, except at occa-

sional points at greater elevation. Of humbler plants, *Heuchera pubescens* and *Linnæa borealis* are the most conspicuous, the latter, in great profusion and of great vigor, spreading widely under the adjacent Pines and Hemlocks, where it seems perfectly at home. One can scarcely imagine a more perfect example of a high northern flora localized on a few square rods, because of favorable temperature conditions.

As if to give emphasis to this little boreal colony among the rocks, there is found, scarce two hundred yards away, a narrow intervale bordering the stream, which here makes another abrupt turn. Upon this alluvial bottom grow a score or more of vigorous Papaws (*Asiminia triloba*), with trunks six, eight and ten inches in diameter. Their lustrous dark green and pendent leaves mark them at a distance as distinct from any other native tree, and suggest a grove of Horse Chestnuts. They must have been here a long time, for they seem perfectly established, fruit readily, and young trees are not uncommon. One such clump, strangely placed high and dry on the border of the dusty pike two hundred yards away, seems quite successful in its struggle for existence. Professor Porter long ago told me that the Papaw followed the Juniata, and was found at the mouth of Spruce Creek. He may have referred to these same trees. I know of no others to the north, and infer that these mark the furthest point for this species in the mountain districts.

A fine *Aristolochia Sipho*, clambering over and well-nigh smothering a Red Cedar, seemed to add to the southern character of this Papaw bottom.

A grove of stately White Pines completes the attractions of this unique spot, which is a favorite picnicking ground for the neighborhood. In the early summer such parties frequently make ice-cream on the spot, using the ice taken out of the holes in the rocks.

State College, Pa. *W. A. Buckhout.*

Notes on North American Trees.—XXVIII.

THE synonymy of the Texas Cercis, or Red Bud, is peculiar. This plant appears to have been first collected by Berlandier, in the region of the lower Rio Grande, as long ago as November, 1828, one of his specimens of that date being preserved in the Gray Herbarium. Lindheimer, many years afterward, found it at New Braunfels and sent it to Engelmann, who called it *Cercis reniformis*, but did not publish his name, or anything about the plant. Gray, in the second part of the "Plantæ Lindheimerianæ" (*Bost. Jour. Nat. Hist.*, 1850, p. 177), was the first author to describe it, making it a variety of *C. occidentalis*, "var. *floribus etiam paulo minoribus, foliis supra nitidioribus*," referring to the *C. reniformis*, Engelmann, but without taking up Engelmann's manuscript name for his variety and without giving it another. Torrey next mentioned it in 1859 in the "Botany of the Mexican Boundary Survey" as *C. occidentalis*, confounding it with the California species, and Hemsley, much later, did the same in his "Botany of the Biological Survey of Central America." Watson, in his "Bibliographical Index to North American Botany," next called the Texas Cercis *C. occidentalis*, var. *Texensis*, but in the "Botany of California," and later, in a list of plants from south-western Texas and northern Mexico, collected chiefly by Dr. Edward Palmer in 1878–80, and published in vol. xvii. of the *Proceedings of the American Academy*, called it *C. reniformis*. This name, as of Engelmann, had, moreover, appeared many years before without description in Roemer's work on Texas, in which it was, no doubt, included by Scheele, who supplied the botanical parts on the strength of specimens which Engelmann had probably sent to the Berlin Herbarium, with which he was always in active correspondence.

From this it appears that the first published specific or varietal name is Watson's *C. occidentalis*, var. *Texensis*, and the Texas plant, being considered distinct from the California species, should be called *C. Texensis*.

Mr. Sereno Watson calls my attention to the fact that the date of the publication of Ventenat's "Description des Plantes Nouvelles et peu Connues Cultivées dans le Jardin de J. M. Cels" is not 1803, as I had supposed, but 1800, which, being the date of the publication of *Robinia viscosa*, that name must take precedence of *Robinia glutinosa*.

C. S. Sargent.

Filices Mexicanæ.—I.

WE take pleasure in offering our readers an enumeration of the Ferns collected in the states of Nuevo Leon, Jalisco, San Louis Potosi and Machoacan, Mexico, during the seasons of 1888, 1889 and 1890, by C. G. Pringle, of Charlotte, Vermont, with notes and descriptions of new species and varieties by George E. Davenport, of Medford, Massachusetts.

Mr. Pringle's Fern collections are now so well known that it may be of interest to preface these notes with some extracts from his correspondence, in which he describes the regions where, for the most part, the Ferns herein enumerated grew. Writing from Chihuahua, under date of August 4th, 1888, he thus described Monterey and vicinity, where, during the early part of 1888, his collection was principally made: "Delightful are my memories of Monterey, a quiet pleasant city, with lofty precipitous mountains round about it on three sides, mountains furrowed with cañons shady with numerous grand trees, and musical each with its clear, cold brook. It is the paradise of Ferns! Common as any weed on the foot-hills which overlook the city was *Adiantum tricholepis*, so rare hereaway. On limestone ledges or bluffs, soft and crumbling, whose bases were laved by water, was *Aneimia adiantifolia*. *A. Mexicana* was very abundant on moist shaded banks of the base of the Sierra Madre. *Aspidium trifoliatum* on limestone ledges dripping with water. On moist shaded banks *Cheilanthes meifolia* (Palmer's find of 1880) was abundant; with it a Pellœa which I don't know, and an Aspidium strange to me. What I guess to be *Llavia cordifolia* was common near brooks of the mountains, and rare there a Polypodium which I never saw, and in their dark, cold nooks still another Polypodium, with annual fronds. Here, of course, *Aspidium patens* was luxuriant, and sometimes *Pteris Cretica*."

Pellæa flexuosa, *Cheilanthes leucopoda* and *Cheilanthes aspera* are some of the other Ferns mentioned by Mr. Pringle in the letter just quoted. Subsequently, on his return home to Charlotte, he sent to me the following interesting account of "The Haunts of Ferns about Gaudalajara":

"Some six miles northward from the city the great St. James River (Rio Grande de Santiago) which carries the overflow of Lake Chapala down to the Pacific, falling more than 5,000 feet in a course of 250 miles, has cut a chasm through the plains which the proud city crowns, and among various chains of low mountains which interrupt those plains and this chasm is the great barranca of Gaudalajara. You stand on the verge of the plain and see the river rushing white 1,500 feet below you. Beneath your feet are dizzy cliffs on cliffs, steep grassy slopes and still deeper descents which are a luxuriant growth of tropical shrubs. Here and there, over these steeps, springs start from the rock or rise from the soil, and streams leap down to the river. Against the face of fearful precipices they hang as a slender veil of a waterfall, or they saturate the rich soil of the thickets. All the diverse situations on the slopes of the great barranca are the favorite haunts of some Fern or other, whether it be the dry cliffs in sun or shade, the ledges of cliffs sprayed by falling water, the deep shade of thickets clustered by brook-sides, the cool and moist grassy banks, or the mossy banks and ledges in the humid forests near the river.

"Down to the river from among the hills come lesser cañons, each with its noisy brook, which sometimes pours over a precipice in its way, and diffuses over the adjacent walls a perpetual mist or spray.

"Again, just north of the city walls, a strange thing has happened. The occasional floods from the plains above have cut gullies, sometimes broad, grassy and shaded with trees; sometimes too narrow to admit the passage of your body. The walls of these are twenty to fifty feet high, perpendicular, firm sand or gravel, more or less moist. From the foot of these walls water drips, and close by a a brook flows.

"Still, again, there are conditions favorable to Ferns supplied by man. It is customary to mark the bounds of highways and fields by trenches five to ten feet deep. Along the edges of these are planted, or grow spontaneously, Cactuses and shrubs, so that shade is provided.

"At the end of my stay I crept for a long way through the vegetation filling a trench of this sort which borders the north side of the highway leading westward from the city gate; and I remember declaring to a friend, as I came out of it, that I had seen on its steep moist banks nearly all the Ferns which I had met with in all the region roundabout.

"Now you can form a definite idea of the habitat of the species of my collection from the words borne by their tickets."

The numbers herein used should correspond to those on Mr. Pringle's tickets accompanying his distribution.

ACROSTICHUM ARANEOSUM, D. C. Eaton (2590). Shaded cliffs near Guadalajara, November, 1889.

Fig. 71.—Asplenium Pringlei.—See page 448.

ACROSTICHUM SPATHULATUM, Bory (2606). Cool damp bluffs near Guadalajara, November, 1889.

ADIANTUM CONCINNUM, H. B. K. (1866). Moist shady banks near Guadalajara, November, 1888.

ADIANTUM CONVOLUTUM, Fournier (1868). With 1866.

ADIANTUM PATENS, Willd. (1869). Cool grassy slopes of the Barranca, November, 1888.

ADIANTUM TENERUM, Swartz (3360). Cool ledges, Tamasopo Cañon, San Luis Potosi, 1890.

ADIANTUM THALICTROIDES, Willd. (1867). Moist shady banks, Guadalajara, November, 1888.

ADIANTUM TRICHOLEPIS, Fée (1981). Foot-hills near Monterey, abundant; (1843) moist shady places in the Barranca, near Guadalajara, December, 1888, scarce.

ANEIMIA ADIANTIFOLIA, Swartz (1977). Moist calcareous river bluffs, Monterey, June, 1888.

ANEIMIA HIRSUTA, Swz. (1833). Moist slopes near Guadalajara, November, 1888, and with it a deeply cut form approaching Baker's var. *tenella*.

ANEIMIA MEXICANA, Klotzsch (1976). Moist ledges and banks, Sierra Madre, near Monterey, June, 1888.

ANEIMIA PHYLLITIDIS, Swz. (3361). Moist shady banks, Las Canoas, November, 1890.

ANEIMIA TOMENTOSA, Swz., var. *fulva*, Hooker and Baker (1834). Moist slopes, near Guadalajara, November, 1888.

ASPIDIUM ACROSTICHOIDES, Swz. (2604). Sierra Madre, near Monterey, August, 1889.

ASPIDIUM ATHYRIOIDES, M. & G. (*Nephrodium syphærocarpum*, Hook.), (1840). Wet banks and ledges, near Guadalajara, December, 1888. This and *A. patulum*, it seems to me, are scarcely more than forms of one protean species, *A. Mexicanum*. The differences between them all are hardly greater than those which exist between the different forms of *A. spinulosum*.

ASPIDIUM JUGLANDIFOLIUM (1982). Cool, shaded cañons, near Monterey, June, 1888; and again in Tamasopo Cañon, June, 1890.

ASPIDIUM MEXICANUM, Kunze (2605).

ASPIDIUM PATULUM, Swz. (3362). Shaded ledges, hills of Patzcuaro, November, 1890. See remarks on *A. Athyrioides*.

ASPIDIUM TRIFOLIATUM, Swz. (1983). Wet ledges and banks, Sierra Madre, near Monterey, June, 1888.

ASPLENIUM CICUTARIUM, Swz. (3365). Rich soil, mountain sides, Tamasopo Cañon, November, 1890. Specimens remarkably fine and beautiful.

ASPLENIUM ERECTUM, Bory (3413), normal form; (3412), var. *proliferum*, Hooker, both from rich forests, Tamasopo Cañon, November, 1890; and (3367) var. *sub-bipinnatum*, Hook., from rich soil, mountain sides, Tamasopo Cañon, November, 1890. The last two very proliferous.

[NOTE.—I have preferred to follow the authority of Sir William Jackson Hooker here, in using Bory's name in preference to *A. lunulatum*, Swartz, notwithstanding the eminent authority of Mettenius and Kunze, because, if, as Dr. Hooker stated in the "Species Filicum," no authentic specimen and no authentic intelligible description of Swartz's species exist, and if, as Dr. Hooker asserted, the plant itself was really unknown to Swartz, it is difficult to understand upon what justifiable grounds the adoption of Swartz's name rests.]

ASPLENIUM FRAGRANS, Swz. (3364). On rocks and trees, Tamasopo Cañon, November, 1890.

ASPLENIUM FURCATUM, Thunb. (3363). On Oaks, hills, Patzcuaro, state of Machoacan, November, 1890.

ASPLENIUM PRINGLEI, *n. sp.* (1837). Root-stocks tufted; fronds clustered, 3′ to 9′ tall, ½′ to ¾′ broad in the middle,

narrowed both ways, evergreen, pinnate, with from twenty to thirty pairs of variable oblique pinnæ; stipites short, blackish brown, naked, or with a few slight scales at base; pinnæ generally subsessile, 2" to 5" long, half as broad, deeply cut into irregular oblique obtuse lobes, unequally wedge-shaped at base, cut away most on the lower side, and sometimes almost if not wholly dimidiate, often truncate at base on the upper side with the superior basal lobe again deeply cleft into incised lobes; lower pinnæ gradually reduced, more equal-sided, ovate, slightly stalked, with cuneate or truncate bases, and cleft into three incised lobes; rachis, blackish brown, like the stipes, channeled, flexuose, curving from above the middle into semicircles; sori large, borne on the free veinlets in two to four pairs, each sorus, when mature, filling an entire lobe, and set obliquely to the costa.

Habitat: Wet cliffs, near Guadalajara, state of Jalisco, December 5th, 1888. This very lovely Fern bears some resemblance to the incised form of *A. Trichomanes*, and it is closely allied to that species. It differs from that species, however, conspicuously by the unusual size and position of the prominent sori, which are placed within and near the edges of the lobes, so that the fructification appears to be marginal, and by the remarkable curvatures of the exceedingly flexuose rachises. In some specimens there appears to be a slight membraneous edge running along the sides of the rachis and round the margins of the pinnæ, having the appearance of a faint bloom when held to the light.

The excellent portrait of this Fern, on page 449, is from a drawing by Mr. C. E. Faxon.

Foreign Correspondence.

London Letter.

THE end of the flower-season in the open-air garden is approaching, and the Dahlias almost monopolize the attention of florists, for the unusually wet and cold August has been disastrous to such flowers of the sun as Gladioli and Lilies, which are the features of English gardens in August. This week I have had a look in at some of the nurseries, and the finest flowers of the season, to my mind, are the hybrid French Cannas at Cannell's, at Swanley. No doubt, the grand productions of Crousse have already crossed the Atlantic, and your lovers of brilliantly colored flowers and noble foliage already have the older kinds under cultivation. These gorgeous plants have come upon us all of a sudden, for I know of no flowers that have been improved in such an extraordinary way in so short a time, and our French neighbors seem to have been at work upon them before we were aware of it. The French florists seem to take the initiative in the production of new races of garden-plants, which they do with few exceptions; Roses, Gladioli, Delphiniums, Ivy Pelargoniums, Montbretias, Chrysanthemums, Caladiums, of all of which we have now such a variety, are mainly due to the enterprise of the French hybridists. These Cannas are well worth a long journey to enjoy, for the brilliancy of their flowers en masse rising from their handsome foliage is different from the ordinary run of greenhouse plants. There are now a good many sorts, mostly all with French names, but those that pleased me most were the following: Paul Bert, a noble, tall-growing variety, with broad leaves stained with plum-purple and large Gladiolus-like flowers of a brilliant orange-red; Francois Morel, three feet high, flowers an intensely deep crimson; Keteleeri, dwarf flowers, orange-scarlet; Edouard André, brilliant orange-scarlet, rather tall, and certainly one of the finest; Wilhelm Pfitzer, flowers large and of the richest deep crimson, remarkably showy; Madame de Grillon, flowers yellow, with red centre; Jules Chretien, flowers large, brilliant scarlet; Comte de Choiseul, dwarf, only about one and a half feet high, and similar in color to the last; Admiral Courbet, cherry-crimson; Professor David, a very distinct sort, with flowers scarlet, blotched and margined on the petals with yellow; Legionnaire, tall purplish foliage, vivid crimson flowers; T. S. Ware, orange-scarlet. These comprise a dozen of the very finest kinds, and though from description they may seem to be similar to each other in color, they are really distinct, either in growth or shade of color. The best time to obtain a stock of Cannas is when the plants are in a dry state in autumn; they will then travel as safely as bulbs, and I am taking with me to India a large number of the best kinds. I can foresee what grand plants they will be in masses in the open, as the common *Canna indica* is one of the most effective plants there in the garden-landscape.

At Veitchs', at Chelsea, one may see another new race of hybrids which is purely of English origin. These are the hybrid Streptocarpuses, which Mr. Watson has already mentioned. It may be well to add, however, that these new Streptocarpuses are regarded here as one of the most important novelties that have been produced by skillful hybridizing. It seems but a few years ago when the species from which these hybrids have been mainly produced were obscure botanic garden-plants, and even up to within a year or so they were not generally known, and Mr. Watson had raised his first crosses at Kew long before even the nurserymen knew about them. But now that the Messrs. Veitch have taken up the thread of the work where he left off, we shall soon see these beautiful plants common in every greenhouse, for they need only to be seen to be appreciated even by those who will only look at showy plants. The species that have been worked upon were generally known in cultivation under the names of *S. Rexii*, *S. biflorus*, *S. floribundus*, *S. polyanthus* and *S. Saundersi*, but it was not until the extraordinary monophyllus species, *S. Dunni*, was introduced that any decided break was obtained. This species has a huge leaf, and produces an abundance of dull red small flowers, different in tint from any of the rest, so that there was something to work upon. Mr. Watson raised several striking crosses, among them being those named *S. Watsoni* and *S. Kewensis*, the former especially showing in its flowers the distinct reddish color of *S. Dunni*. Among the multitude of seedlings he has raised you may single out every shade, ranging from pure white to bright purple, stained with plum-purple and violet, and these are the foundation that the hybridist at Veitchs' had to work upon. Now one may see seedlings at the Chelsea nursery by the thousand, planted out in cold frames, and flowering profusely, and, naturally, some show an advance on the original Kew hybrids both in size of flower and variety and brightness of coloring. It may not be rash to predict that eventually we shall have Streptocarpus-flowers as large as those of Gloxinias, the horizontal-flowered type of which they somewhat resemble. As the Streptocarpuses are so easily grown in an ordinary frame during summer, or in a greenhouse, they are destined to become popular, and the fact that they flower so freely and so continuously for several months in the year enhances their value. I counted as many as twenty flowers on a small plant at Veitchs', and being on slender long stalks they are very suitable for cutting. Already the seed of these hybrids is enumerated in the seed catalogue of the firm, so that a pinch of seed may be obtained that would furnish enough plants for a greenhouse.

As this is the dull season for Orchids they comprise one of the features of the great Chelsea nursery, but I lingered over the other great feature at the present time, which is the Nepenthes, or Pitcher Plant house, which, at this season, after the pitchers have reached full size and color, is at its best. Among the kinds that the grower points out as being of superlative merit is the new *N. Northiana*, named after Miss North, the traveler and artist who, I believe, discovered it. It has the full-grown pitchers, over a foot long and from three inches to five inches broad, heavily spotted and striped with crimson on a pale green ground. It is extremely handsome in form also, as the broad rim of the pitcher is shaped and reflexed in a beautiful way. The other new or notable Pitchers are *N. Burkei*, *N. Curtisii superba* and *N. cincta*, which has the pitchers most beautifully marked with crimson and purple-crimson on pale green. But I consider the finest of all is *N. Mastersiana*, which has a number of red pitchers on every small plant, and has a striking effect among the others. It is

such a strong grower, and produces pitchers so freely, that it is decidedly one of the best.

Coming to Kew, one finds some remarkable plants in flower, perhaps none more interesting to the general public than the Wedding Flower of Lord Howe's Island. *Iris Robinsoniana*, which has flowered for the first time at Kew, has been illustrated in the daily papers, and has been inquired for by visitors more than any other plant during the past month. It is certainly a noble plant, producing a huge tuft of long, reflexed leaves and flower-branched spikes, five or six feet in height, on which numerous flowers expand in quick succession day after day. The blossoms resemble those of *Iris Kæmpferi*, but are smaller; they are pure white, with blotches of clear yellow at the bases of the petals. *I. Robinsoniana* has been described and figured in GARDEN AND FOREST, vol. iv., p. 355.

The "Wedding Flower" absorbs more interest at Kew than the grand climber, *Solandra grandiflora*, which is in flower close by. This, though an old plant from South America, is rarely seen in bloom. It has very large tubular, or rather funnel-shaped, flowers of a creamy white, stained with purple, inside the tube. It is a rampant climber, but may be grown and flowered in small pots, as Mr. Parker used to do, in his nursery at Tooting, in the old days.

Another climber I must mention as being a great attraction at Kew just now, and, indeed, has been throughout the summer. This is *Solanum Wendlandii* (see GARDEN AND FOREST, vol. iv., p. 258), a tropical American species, and, I consider, the finest of the cultivated species. It has huge clusters of rich, mauve-purple flowers, two inches across, which are produced abundantly and hang from the long rambling shoots in a most graceful way. It is, I believe, not in commerce yet, but when it is readily attainable it will be sought for as a choice stove climber. A more modest climber, but very pretty, is *S. Seaforthianum*, which is a less vigorous plant, and bears much smaller flowers in drooping clusters. This is also in flower in the stoves at Kew.

W. Goldring.

Kew.

The Bermuda Onion.

THE island of Bermuda, where the Onion, Potato, Tomato and other garden vegetables make their most vigorous growth from December to May, lies seven hundred miles due south-east from New York, and eight hundred miles due east from Charleston, South Carolina. The temperature from November to June ranges from fifty to seventy-five degrees, never higher, never lower, with never a greater monthly range of temperature than twenty-three degrees, or a greater daily range than fourteen degrees. It is in such a climate as this that the Onion grows with that mild and delicate flavor which gives the Bermuda product a special value on account of quality apart from the advantage it has of coming at an unusual season.

Fig. 72.—Harvesting Onions in Bermuda.

The seed (black seed) of this Onion is all grown in Teneriffe Island, and is of two kinds, one producing white bulbs, and the other red bulbs. The white variety matures from two to three weeks earlier than the red, but is not quite as sweet. No other seed seems to be worth planting in this climate. I have tried many kinds from all parts of the world—black seed, tops, buttons, potato onions, and many more, with the invariable result of a fine crop of "scullion"; they absolutely refuse to "bottom," while with the black seed Teneriffe nine out of ten will make fine bottoms.

The seed is very thickly sown in rows eight inches apart in seed-beds three feet wide, these beds being prepared with the most scrupulous care and enriched with enormous quantities of well-rotted cow or pig manure. The failure of these seed-

beds means the failure of the crop. The first sowing is usually made the last week in September—at the time when the northern farmer is getting ready for the long winter—and the sowing is kept up with seed of both varieties until the first week in November, and this gives a succession of plants for transplanting into the fields. This transplanting begins in December and continues until the middle of January.

The fields are little pockets of earth scattered here and there over the island, being deposits in the depression between the rocks at some period during the submergence of the island; they seldom contain an area of more than two acres, and the larger proportion of them contain less than half an acre. These fields are usually surrounded with Oleander-hedges to keep off the winter gales which are likely to do some harm to tender vegetation. The soil is prepared with great care by plowing or spading in stable-manure, sea-weed and every artificial fertilizer known in the market. Beds three feet wide are made by treading paths through the field, and in these beds the little plants, about as large as a goose-quill, are transplanted from the seed-beds. This is a rather slow process, but the Bermudian farmer finds it much the best method of cultivation. It is often asked by Americans, "Why not sow the seeds in the field to begin with, and thus save all this labor of transplanting?" In the first place, the Onion makes a better growth and forms a better bulb when transplanted, and not two out of a hundred plants are lost by transplanting, as they are sure to take root, and in two or three days are just as fresh as when they were taken from the seed-bed. Again, it takes from four and a half to five months for the Onion to mature for the market from the seed, and from two to two and a half months of this period, while the plants are in their tender growth, is spent in the seed-beds, where one man can weed and care for enough plants for ten acres. If these plants were in the fields, at this stage, it would take at least ten men to keep the weeds down, and therefore much labor is saved. Bermuda weeds do not succumb to the hoe and sun as in the north, but each weed must be carefully pulled by the roots and carried away to the pig-pen or else spaded deep in the walkways.

I suppose no land is free from plant-disease, and the Onion here has its diseases, though the only one causing much trouble is a fungus growth, attacking the leaf just as the bulb is forming, causing the leaves to rot and arresting the growth of the bulb.

When the Onion is ready for the market, men, women and children, mostly colored, are employed to pull, pack and cart to the steamer, packing the Onions in bushel crates made from box stuff brought in shooks from Maine. These crates, when ready for packing, cost about twelve cents each. During the crop season a steamer is loaded and departs for New York every Thursday. The balance of the year we only have fortnightly communication with New York.

The number of crates harvested from an acre varies with the year, season and amount of disease. I have known eight hundred crates to be gathered from an acre, but probably two hundred is nearer the average. The price varies with the season, usually opening in January at $2 a bushel box here, and rapidly dropping to $1.50, and then on down to $1 and to 75c. in May.

The average price paid here for the past six years is as follows: 1886, $1.35; 1887, $1; 1888, $1.65; 1889, 53c.; 1890, $1.44; 1891, $1.28.

The quantity shipped for the same period is as follows: 1886, 154,000 bushels; 1887, 197,000 bushels; 1888, 163,000 bushels; 1889, 227,000 bushels; 1890, 252,000 bushels; 1891, 261,000 bushels.

The total number of acres cultivated on the island in the winter of 1890-91 in Onions, Potatoes, Tomatoes and Beets was 2,422.

Much alarm was felt over the M'Kinley bill, as onions now pay to the United States a duty of forty cents per bushel, but, after all, the price kept up well through all the season. The Bermudians generally feel that they pay this tax, as that amount has to be paid before they can enter into competition with the American farmer. $104,400 was paid into the United States Treasury by somebody because of the importation of 261,000 bushels of Bermuda Onions into the port of New York during the winter of 1890-91. As the average price paid here was less than any year, except one, during the past six years, I am inclined to think we pay the tax.

Hamilton, Bermuda Island. *Russell Hastings.*

[The illustration of an Onion-field in Bermuda, on page 451, gives a fair idea of the general appearance of the scanty farm-land on the island and the ever-present Cedars.—Ed.]

Cultural Department.

Insecticides for Greenhouse Plants.

In the press of fall work the cleaning of plants is often postponed until some more convenient time, and this is usually regretted afterward when the stock is found permanently injured by the ravages of scale or other insects. Among Palms, for instance, some of the scale insects are the most troublesome, and if allowed to remain on the foliage or stems for any length of time the plant will be badly disfigured. A whale-oil soap solution, made by dissolving one ounce of the soap in one gallon of water, or a very weak kerosene emulsion, may be applied with a spray-pump or syringe about once a week, with good effect, though if a plant is badly infested with scale it will need more than mere spraying to clean it. In using the kerosene emulsion it is safest to make the solution rather weak, to guard against injury to the young foliage if the liquid drains down into the heart of the plant.

Some of the prepared insecticides, for instance, Fir-tree oil, may also be used in the same manner, and they are doubtless of some value, though much more expensive than the home-made remedies. Thrips are best controlled by the use of tobacco-stems for fumigating, or the infected plants can be dipped in tobacco-water, the latter plan being most convenient where many kinds of plants are grown in the same house. Red spider is seldom found among plants that are syringed properly, but when it gets a foothold in a warm house the plants should be carefully sponged at once.

The so-called "spot" on Pandanus, and on *P. utilis* especially, is caused by a minute mite or insect, and is not, as some have supposed, due to a fungus, and the most satisfactory remedy is thorough dusting with sulphur. The credit of this discovery should be given to Professor Halstead, of the New Jersey Experiment Station, who kindly examined specimens and suggested the remedy which has proved effective in practice.

The Ferns are subject to various insect pests, the most injurious of which are scale and thrips, and as these plants will not endure as much smoke as the insects will, it becomes necessary to depend on dipping the plants in weak tobacco solutions. Some of this trouble may be avoided, however, by keeping the Fern-house as cool as the welfare of the plants will permit during the winter. Many of the best-known species thrive admirably in a temperature of fifty degrees at night. Another troublesome pest to the Fern-grower are the snails, and while the old-fashioned method of spreading about the house cabbage-leaves or pieces of potatoes as traps is still a good one, yet a cleaner and more efficient plan is to sprinkle camphor among the plants. This gum is so obnoxious to the snails that a few pieces the size of a pea thrown in the crown of a large Adiantum will surely drive them out. Of course, the camphor needs renewing from time to time, as it soon evaporates, and, consequently, will cost rather more than the old vegetable remedies.

Among other insecticides that I have tested for general use are corrosive sublimate, one part in solution with 2,000 parts of water, and carbolic acid in various degrees of strength, but with little success in either case. Acetic ether is useful at times to destroy mealy-bugs in the flower-trusses of Ixoras or Stephanotis, but it should be applied with a camel's-hair brush. Sulphate of lime has been recommended for scale on Orange-trees, but my experiments with this mixture on some young Palms have not proved successful.

Holmesburg, Pa. *W. H. Taplin.*

Border Flowers in Autumn.

Erythrolæna conspicua.—This plant, the "Scarlet Mexican Thistle," as it has been styled, promises to be useful for sub-tropical bedding, for, though only a thistle, it has an imposing appearance when well grown, and when in flower arrests attention at once by the bright-colored bracts of the flowers. From a packet of seeds sown in February we obtained three plants, which were liberally treated, and one of these is now flowering. It is six feet high, with branches overshadowing a square yard of ground. The plant is distinct in habit, and, when in flower, very ornamental. It is necessary to sow the seed early in the year to get the plants to flower the same summer, as our seasons are too short, and, as it is, we shall not be able to obtain any seed this year.

Helianthus mollis.—Of the many species of hardy Sunflowers this is one deserving of front rank as a hardy garden-plant. I know of no species that flowers with such persistency, for since it began in July we have always had an abundance of bloom, and there are still many to follow until frost comes.

Part of our plants were obtained from Tennessee, where it is said to occur occasionally in a wild state, and is often cultivated in gardens even there. Other plants were received from another source, which, I believe, was said to have been originally New Mexico, and this is quite probable, as this species has a wide distribution in the southern and south-western states; consequently there were doubts in my mind as to its hardiness, and a plant was left out in a cold wet border last winter. It came through safely, so there need be no doubt about it in the future, for in the same border strong and established clumps of *H. orgyalis* were completely killed, and so was the double *H. multiflorus*, so often catalogued as being perfectly hardy, which it certainly is not here. *H. mollis* grows about five feet high in good soil. The flowers are large, bright yellow, of good substance, and can be cut with long stems for vases, and when it is offered to the public and becomes better known will surely be appreciated as one of our very best hardy Sunflowers.

Helianthus grandiplenus.—This is our first season's experience with this new form of the common double *H. multiflorus* as introduced by Hartland, of Cork. There are said to be other forms distributed under this name, so care was taken to procure the true variety direct from the introducer. The difference in the individual flowers is not very apparent except by comparison, when it is seen at once that in the variety Grandiplenus the outer row, or guard petals, are not present, as in the older variety, making it quite distinct in that respect. Our plants, also, are much taller than in the older variety. One clump has grown eight feet high and is much more spreading in habit, the flowers also can be cut with longer stems; but these three traits may all be due to liberal treatment. It is to be hoped it will prove hardier than the older variety. Judging from the plant as it is, it is a question if there is any great advance made from the old double *H. multiflorus*, of which there are several very good single forms which do not seem to have gained popularity as they deserve, for they are as beautiful as single medium-sized Sunflowers for cutting purposes.

South Lancaster, Mass. *E. O. Orpet.*

The Water Garden.

Nymphæa Mexicana, of which Mr. Pringle wrote so charmingly in Garden and Forest (vol. iii., p. 415), may be botanically the same as *N. flava*, but it proves superior to the type in its more free-flowering habit. Growers generally find *N. flava* very slow to establish and very shy to flower, but *N. Mexicana*, in its second season here, grows strongly, with many strong runners, which quickly bloom, and it has given a long succession of its deep yellow flowers, which are attractive, though small. They are much darker than those of *N. chromatella*, and, unlike this variety, the stamens and petals are of the same shade.

N. chromatella, however, is far the best yellow Nymphæa, a strong, compact grower, easily propagated from its numerous eyes, and constantly in bloom. A strong plant, with only the root-room of a small box, has been constantly in flower since early May, and still has some buds unexpanded.

Eichornia (*Pontederia*) *azurea*, the new pond-weed introduced this year by Mr. Sturtevant, proves much superior to *E. crassipes major*, it being not more interesting, perhaps, but less weedy. The stems, produced freely, are sent out laterally, and from these flowers are produced very freely. The flowers, which are clustered on a short stem, are one inch in diameter, a dark purple, with a darker eye, and in every respect more attractive than those of *E. crassipes*. Unlike the latter plant, however, which is a weedy grower, whether floating or planted in earth, *E. azurea* requires planting in shallow places.

Elizabeth, N. J. *J. N. Gerard.*

In the Vegetable Garden.

As the nights grow cool Celery is making its best growth. Pick off the rusted leaves, keep it clean and never let it thirst for water. It is too early to earth up the main crop, but it is well, once a fortnight, to draw a little soil about the plants needed for early use. Celery will whiten now much more rapidly than it does after the middle of October.

Lettuce can endure a light frost, but it is better to have cold frames ready. Lettuce had better be planted now in frames, but sashes should not be used, except as a protection against beating rains, until heavy frost comes. It is a good time to sow Lettuce, and if the ground is kept clean among the plants they will head in November, and the rest of the half-grown plants will head in the winter.

Spinach can still be sown in sheltered beds facing the south, and some of the plants will be fit to use before winter sets in. At all events, it will be in good condition for early spring use.

When the Asparagus begins to turn yellow it is well to cut the beds over before the seeds fall, for the young plants will prove troublesome weeds in the bed next year. If the tops are burned it will lessen the attacks of the beetles next spring.

Cabbage and Cauliflower which are still growing should be kept well hoed. If Cauliflowers do not make full-sized hearts before freezing weather they can be heeled thickly in cold frames, and will be fit to use by Christmas. If the larger Cabbage shows a tendency to burst open it is good practice to loosen their roots with a fork.

Lima Beans that are not matured can be kept through early frosts by laying down the poles so that they can be covered by newspapers or muslin; and Snap Beans can be saved for a little while if protected in the same way. If you have no Snap Beans this autumn make a memorandum now to plant some of the prolific sorts, like the Valentine, next year for autumn use.

Montclair, N. J. *S.*

Pelargonium Blight.—During the present season the variegated Pelargoniums, or Geraniums, as they are commonly called, so popular for bedding and borders, have been noticeably blighted, and in some instances so much so as to become positively unsightly. As a rule, the outer or lower leaves are the most susceptible, but not rarely the best of the large central leaves become attacked. This blight is due to at least two fungi, working singly or together, and either one of them is able to do serious mischief. One of these fungi is a Colletotrichum, akin to that causing the anthracnose of the Vine and many other cultivated plants. There is little doubt that this blight could be checked by spraying with some of the copper mixtures. A second fungus is an Aschochyta, which may be called a leaf-spot fungus. This is more inclined to produce a well-defined infested area near the centre of the leaf, but the two enemies may work together upon the leaf. The same remedy is recommended.

Nematodes in Zinnias.—My attention has been called a number of times recently to a trouble among the Zinnias, and particularly *Z. elegans*. The lower leaves prematurely die, and hang upon the stems as crumpled brown masses, giving the afflicted plants anything else than a handsome appearance. Above these the leaves are more or less blotched with light brown, the affected areas varying in size and color, but usually quite angular in outline. The whole aspect of the sick plants suggested the work of eel-worms, and a microscope examination revealed them at work in the leaf-pulp, and in great numbers. Plants thus infested are beyond recovery, and should be burned. Last season eel-worms were mentioned as occurring in quite a number of the cultivated plants, and particularly the Chrysanthemums, Coleus, Lantanas, Bouvardias, Violets and Roses.

Rutgers College. *Byron D. Halsted.*

Cestrum elegans.—This is generally grown as a climber, and is best seen trained over an arch, where its graceful flower-stems, sometimes nearly two feet in length, hang out in all directions, with clusters of tubular wax-like pink flowers. It would be a most excellent plant for cut flowers but for its strong potato-like odor when handled, an odor which is not surprising, for it belongs to the *Solanaceæ*. Grown as a pot-plant it is equally handsome, and useful for decorative purposes. Cuttings taken in winter, and planted out for the summer, grow to a size which makes a twelve-inch pot necessary when they are lifted in autumn. My plants are showing flower-buds now in the open ground, and will bloom in the greenhouse through November and December, when I take a few more cuttings and throw the old plants away. Although used as a climber when grown in the open air, it shows no tendency to climb in the house, and makes good bushy plants without any trouble.

Peristrophe speciosa.—This handsome winter-blooming greenhouse plant is of very easy culture, and should be common. Cuttings which have been rooted during the winter, when planted out-doors make very neat plants by autumn, and, unless large plants are needed, they are more satisfactory in every way than old plants cut down, which are generally used. To have them bushy, they need to be "topped" two or three times during the season. They can be lifted with a good ball of earth, and usually go into a seven-inch pot. Their foliage is handsome. The flowers are labiate, crimson or pink in color, and are sessile on conical heads.

Wellesley, Mass. *T. D. Hatfield.*

Correspondence.

The Boston Public Garden.

To the Editor of Garden and Forest:

Sir,—There are some questions that I should be glad to have answered with regard to the floral decorations of the Boston Public Garden.

We who live in the neighborhood of the Modern Athens naturally go there for our ideas about gardening, as well as other things, and we feel as if the Public Garden, which, next to the State House and Faneuil Hall, is an object of legitimate pride to that city, ought to furnish for the million the best sort of example.

That its directors, whoever they may be, understand their business no one ventures to doubt, but do they not make a mistake in trying to popularize the garden by introducing objects not in the best taste?

Is it conceivable, however the pure Greek artistic sense displayed itself in gardens, that Pericles and Aspasia would ever have encountered, at the foot of Mars Hill, such a horticultural construction as that which causes the bosom of the Modern Athenian to dilate with civic pride—Item, a spread eagle with a glass eye, complicated with a design of anchors, coiled ropes, and the shield of our country, surmounted by the letters U. S. N., painfully manufactured, at enormous expense, of minute plants of the requisite colors, and resembling nothing so much as those feats in worsted-work rugs which are the glory of agricultural fairs?

Would the Attic idea of color and form have found expression in floral hearts and rounds, aces of spades, crescents and likenesses to half-eaten doughnuts, brought out in shades that swear at each other in the loudest tones? Pink and yellow, deep crimson and scarlet, orange and rose-color, sometimes all six together in one bed, seem to be a favorite combination, to the defiance of harmony and repose.

Boston delights in sending missionaries of its somewhat Philistine civilization to Japan, why does it not occur to the philanthropists of the Flowery Kingdom to send it a few in return, missionaries of taste, whose "oriental eye" should educate it to a comprehension, if not of subtleties of color, at least to reticence in its use, and teach it, once for all, that the desire to mix crimson Coleus with scarlet Geranium is a temptation of the devil to be strenuously resisted.

Might it it not be well, too, that the same apostle should direct the curves of those labyrinthine paths, so that, however sinuous their course, they may lead somewhere, and not necessarily force you to come out, like the well-known parliamentary speaker, at the same hole you went in at.

Is the confusion of effect desirable or necessary? Is there not some way by which we could be given masses of color, and yet an element of repose? It is not that one objects to formal gardening, but to the lines on which that formal gardening is laid down. Certain ideas have occurred to me which I venture to submit for your approval, asking for correction if they seem unreasonable. And what especially strikes me is the thought of the great amount of money and labor necessary to maintain the grounds in their present condition, which, perhaps, might be expended to better advantage.

The Public Garden is in itself a lovely spot, well shaded, refreshing, with agreeable variety of shrubbery and grass, around a pond of shining water, that is a comfort to the eye and a means of amusement to innumerable children. With some few and inexpensive changes and some guiding taste, it seems as if it might readily be made the thing of beauty that it ought to be, to comport with the elegance and charm of the picturesque city of which it should be a thoroughly artistic ornament.

It is now conducted on an unnecessarily costly scale. The elaborate and doubtful floral designs once banished, with the Palms and Tree Ferns, money would abound for more pleasing adornment. The paths should, in the first place, be reconstructed, so that they would lead from one point to another without maddening turns upon themselves. The restricted patches of greensward should be combined into broad stretches of almost unnbroken lawn, shaded and cool, with borders and vistas of shrubbery that should seclude, and, at the same time, seemingly increase its extent.

Geometrical flower-beds and formal gardening need not be given up, but they should be confined, as in the great pleasure-grounds of Europe, to a central parterre in the neighborhood of the leading walk across the bridge, while the rest of the garden should be kept simple and restful.

The taste that demands eagles, and anchors, and designs drawn from the poker-table should be ignored, and an effort made to educate the public to an appreciation of something better. The instinct for beauty is strong in our people; though often misdirected, it can be easily influenced in the right direction by proper example in those public places which they frequent, and from which they bring away new ideas. The harm done by setting a false standard for imitation is incalculable.

The Public Garden should, above all things, be made a unit, and an intelligent design should animate the whole, and the varying parts be made interdependent. A pleasure-ground of this description is not a botanic garden, where it is necessary to exhibit myriads of incongruous things. Harmony and grace, and beauty, and continual bloom there should be, but not violent contrasts nor inharmonious groupings. There are numerous brilliant and beautiful flowers which could be kept protected in winter at a less cost than the great tropical things, that look so out of place when the east wind is whistling about their elephantine ears, and which would really render the grounds far more gay and charming and delightful to the popular eye.

The opportunities of the pond are wholly neglected, and we see none of those interesting groups of Lotus and Water Lilies that prove so attractive in New York, both in Central Park and in Union Square. If it is objected that the boats are incompatible with the Lilies, why could not some portion of the lake be set apart for their cultivation, and still leave room for the amusement of the children? The people all love these delicate flowers, which shows that they do not demand incongruous groupings for their satisfaction.

Why not make the Public Garden a school of appropriate floral design, rather than a museum of curiosities? The best intelligence and the subtlest perception are none too good to devote to it, since it should be properly regarded as a great educator. What people see here they imitate in their cemeteries, in their gardens, on their lawns. If purple and scarlet are seen combined in the Public Garden, you will find the same enormities repeated in handsome country places, whose gardeners think they have imported a brilliant idea. Canons of elegance must be laid down; beauty must be inculcated by a positive standard; teach what is lovely and of good repute, and education conquers even bad taste. How are we to know the evil from the good but by some striking example of loveliness and harmony to which all can repair for new inspiration? Such an example it is the duty of the Public Garden to set. To know a thing is wrong is easy; to know how to set it right is another matter; and nothing can be more idle than criticism which fails to suggest a remedy. This garden is a boon we all appreciate; the plants in it are remarkably well grown and healthy; we all desire that it should be perfect in beauty, and we ask nothing better than to be shown the paths of beauty that we may walk therein. Knowledge of plants is far more common than a proper sense of their artistic distribution, and it is for these we need the canons and the guiding hand.

Our Japanese apostle might find us unwilling listeners to the preaching of his crusade; but in his land, generations of cultured taste have made the very infants adepts, while the language of their subtle art is still foreign, and hard for many of us to learn. But its restraint, its simplicity, its delicate effect, we can study and practice in our clumsier fashion, until the lessons of ages shall have trained us, too, to a larger, a more subtle sense of what is alike beautiful and befitting.

Newton, Mass. *Sidney Hyde.*

Plants for Shady Places.

To the Editor of Garden and Forest:

Sir,—Will you kindly inform me whether *Daphne Mezereum* would thrive on the north side of a house, where the sun shines about two hours in the morning and perhaps a little longer in the late afternoon?

Millbrook, N. Y. *J. J. D.*

[Few plants can flower successfully on the north side of buildings when they are shaded during the greater part of every day. For such positions plants like the Periwinkle or the Ivy, whose chief beauty consists in their evergreen foliage, usually give greater satisfaction.—Ed.]

Periodical Literature.

In an article called "Woodlands," recently published in the *Nineteenth Century*, Mr. Herbert Maxwell reviews the extent and condition of the forest of Great Britain, and discusses the report of the committee of the House Commons which was appointed to investigate this subject in 1885, and formulated its conclusions two years later. This committee declared

themselves "satisfied that the management of our woodlands might be materially improved . . . and that some considerable proportion of the timber now imported to the (annual) value of £16,000,000 might, under more skillful management, be raised at home." They pointed out that, "whereas nearly every other civilized state possesses one or more forest-schools, there exists in this country (although it boasts a Department of Woods and Forests) no organized system of forestry-instruction except in connection with the Indian service." They unanimously agreed "in recommending the establishment of a Forest Board, of which the main functions should be the establishment of forest-schools, or, at least, of a course of instruction and examination in forestry." From the conclusions of these gentlemen Mr. Maxwell dissents. Although he says they deserve gratitude for having proved "beyond the possibility of doubt that British forestry is at a lamentably low level, and that hardly any effort is being made to redeem what might be a source of public and private wealth from the state to which it has been reduced by ignorance, indolence and indifference," he protests that "it is not possible to endorse their proposal to create a new department of the government to revivify it." He believes that reform should be brought about by concerted action on the part of large land-owners, and that "the first step in the right direction will be taken . . . by summoning a meeting in London of land-owners and others interested in the matter to discuss the position and to take counsel with the managers of the English and Scottish arboricultural societies with the view of securing their co-operation in undertaking the work which the select committee has rightly described as necessary, the neglect of which is discreditable."

Mr. Maxwell's article is suggestive reading for all who are interested in the subject of forests and forestry, but it supplies, of course, little help to those who are anxious to see our own forest-problems satisfactorily disposed of. The condition of our forests is so unlike that of English woodlands, their ownership is so differently distributed, the extent of our country is so much greater than that of Great Britain, that American and English needs cannot be discussed from the same point of view.

Mr. Maxwell's article contains, however, many items that should interest any reader. We read a family likeness to ourselves in his account of the way in which, in most parts of England, the minor products of the forest are systematically wasted. In Surrey, he says, convenient little fagots "made of small brush-wood bound together with a green withe" are used, in continental fashion, for the lighting of fires; but they are unknown in the northern counties and even in London, "whose countless fires are kindled by the much less effective fagots of split-wood." Brush-wood fagots, he explains, "have this advantage over fagots of split-wood, that they kindle much more readily, bursting into a blaze at once, whereas a fire laid with the larger sticks often requires re-kindling."

As an example of the lack of knowledge possessed by English owners and land-agents, with regard to even the commonest native trees, the author cites the case of a gentleman in the south of Scotland who, desiring to make a plantation of Oaks, procured with great pains fine acorns from the south of England. Here the indigenous Oak is *Quercus robur pedunculata*, while in the north of England and in Scotland it is *Q. robur sessiliflora*, the so-called "Durmast Oak." The latter flourishes if planted in the south, but the former does not find proper conditions of growth in the north, and, consequently, though "thirty, forty and fifty years have gone by since these woods were planted, the present owner of them has to deplore that the energy and good intentions of his predecessor were not better directed."

Under the rule of the Romans, which lasted some four centuries, says Mr. Maxwell, the vast forests that had covered England were largely swept away, especially in the north, where strategic considerations long remained paramount. But as early as the twelfth century strict laws were formulated in Scotland for the preservation of what remained, and in 1513 the Scottish Parliament insistently commanded the plantation of woods and hedges in denuded districts, and ordered land-owners to compel their tenants to plant on their holdings one tree yearly for every "mark" of land. "Many traces of this legislation may be recognized to-day in the scenery of Scotland. In every district round old houses or house-sites stand aged Ash-trees, the planting of which was specially encouraged for the manufacture of pike-staves, the pike being the national weapon of Scotsmen as the yew-bow was of Englishmen"; and, we may add, ash-wood having been the favorite material for spears ever since the days of the mighty Achilles.

But denudation went on in Scotland, unchecked by further legislation, until, in the last century, her people had leisure to appreciate their necessities and to attempt to meet them. Then many new plantations of great extent were made, and "a pathetic monument of the good intentions of one great Highland chief in this respect still remains. Just before the rising in 1745 Cameron of Lochiel received a quantity of young trees for planting round Achnacarry, his principal seat; when the summons came for the clan to join the standard of Charles Edward, the plants were hurriedly healed-in, in long lines, to await the return of more peaceful times. But the men who were to have set them out 'came back to Lochaber no more'; the saplings struggled into growth in the trenches as best they could, and there they stand to this day, a double row of Beeches, their silvery stems so closely crowded that a man may hardly force his body between some of them, and under this dark canopy of foliage, the outer boughs of which trail in the swift-running Arkaig, there broods a green twilight the long summer through."

Exhibitions.

The Elizabeth Horticultural Society.

THE flower-show of the Horticultural Society of Elizabeth, New Jersey, held on September 17th and 18th, was of more than local interest. In the early spring, the society, at the suggestion of one of the officers, Mr. T. K. Pembrook, concluded to offer a packet of Aster-seeds to any child who would agree to plant them and bring the result to an exhibition to be held in September, and some five hundred packets were applied for in response to an advertisement in the local journals. This was, so far, encouraging, showing rather more widespread interest than the society had expected, but there was some doubt as to the result, the successful growing of plants from seed sometimes puzzling older persons. The plants were brought in in great numbers, something over five hundred plants in all, and, on the whole, in creditable condition, scarcely up to the florists' standard but vastly more interesting. Taking them as a lot, they indicated probably too much attention, care having degenerated to coddling. There were pathetic exhibits of poor little single weaklings, starved and colorless, on which evidently great care had been expended. The most interesting plants were in two little window-boxes, from two little girls who had no garden, but had managed to grow the greatest variety from their packets of seed, and secured the prizes in the class. Such a curious lot of dwarf, starved plants perhaps never grew in the same space, but it was a pleasure to see the winning cards on them, as they spoke of so much simple, loving, patient care.

The wild flowers collected by the children were not a very satisfactory exhibit, owing to a failure to provide that they should be named and arranged for effect. The true province of a horticultural society would seem to be not the speculation in exhibitions, but the endeavor to induce the cultivation of plants and flowers by the masses, and such experiments as that of the Elizabeth society, if repeated, are sure to result in much good. The large hall was closely filled with collections of flowers and plants from amateurs and florists. The amateur exhibit was led by a grand mass of tropical plants from H. W. and R. Pierce, which occupied a space some forty by fifteen feet, in the centre of the hall. Among these were fine Cycads, Musas, Palms, Marantas, Ferns, etc. Other amateur exhibits were Palms, Dracænas, Tuberous Begonias, etc., by H. A. Haines; garden-flowers, by T. K. Pembrook, T. C. English, and F. K. Day; Eucalyptus, *Grevillea robusta*, Coffee-plants, etc., by E. C. Woodward; specimens of Papyrus, and Aquatics, Bamboos, interesting Begonias, etc., by J. N. Gerard.

The local florists exhibited some fine decorative plants, the first prize for which was awarded to John White. For the best display of cut flowers the first prize was given to J. W. Blakeley. Other prizes went to Miss Hutchinson, J. M. Horsburgh and J. W. Bonnell for floral designs.

The Elizabeth Nursery Company exhibited rare Retinsoporas and shrubs.

One of the exhibits which attracted most attention was a complete collection of rare Nymphæas, Nelumbiums and various Aquatics from Wm. Tricker, Dongan Hills, New York. From the roseries of S. C. Nash, Clifton, New Jersey, came a mass of the fragrant and popular American Beauty Roses.

The interest in this exhibition was so great that the society is considering a Chrysanthemum show during the approaching season.

Notes.

Immense tracts of the Pine-forests which cover the sandy shore regions called the *Landes* in the vicinity of Bordeaux, in France, were recently destroyed by fire, the flames spreading so rapidly that at least ten persons—wood-cutters, hunters and charcoal-burners—are known to have perished.

Under the title "Berlin et son Exposition Horticole de 1890," Monsieur Ernest Bergmann has reprinted from the pages of the *Journal de la Société Nationale d'Horticulture de France* his account of this important exhibition, in which he took part as a member of the jury for awarding the prizes.

A new edition of Gray's "Manual of Botany" has just been issued for the special use of the working botanist. The plates are the same as those from which the larger volume was printed, but this is reduced to 12mo size, printed on thin, yet tough, paper, bound in limp leather covers, and is sold for $2.

We rarely see the Sweet Birch, *Betula lenta*, planted for ornament, but if allowed room to develop into its full proportions it is one of the most graceful of trees. In Laurel Hill Cemetery, in Philadelphia, there is a specimen which stands by itself and has formed an open spreading head of great size, and among the many noteworthy trees in that place this is universally considered one of the most beautiful.

The variety of *Solanum jasminoides*, which has been largely distributed under the name of Grandiflorum, is certainly an admirable summer climber for the garden. The racemes are much larger and more open than those of the type and often carry as many as twenty flowers; while the flowers themselves are larger, some of them being an inch and a quarter across. Its foliage is clean and healthy, and of the deepest green, and forms an admirable background to the pure white flowers which are borne in abundance.

A fountain covered by a large stone canopy, ornamented with a bronze figure of Hebe, has recently been erected in Tompkins Square in this city. The name of its giver has not been made public, but his gift passed through the hands of the New York Moderation Society. The fountain will supply ice-water to all comers free of charge, and will be administered by a keeper who will open the faucets at eight in the morning and close them at midnight. It is estimated that in this poor and densely crowded district fully 5,000 persons will daily avail themselves of the luxury thus supplied.

According to the *Popular Science Monthly*, there are in Hungary about 22,000,000 acres of forest, the Government owning some 3,500,000 acres, while the rest is divided between public corporations and individual owners. "The Government does not sell any part of its forests, but buys more each year. In some parts of the country, as in the eastern region of the Carpathians, woods are found of several thousand acres in extent, consisting for the most part of Red Beech. This is used for fire-wood, carriages, staves and agricultural implements, and in the manufacture of bent wood. There are few fires, and they seldom permanently damage the woods. There are large resinous forests in Transylvania, but they are not very accessible; and there are also some in the district of Marmaros, in the north-east of the country."

The Government report on the condition of the crops notes that the condition of the Potato crop has never been so uniformly good since the Department of Agriculture began to issue these bulletins. This shows the continued prevalence, in all parts of the country, of favorable conditions. Last year there was a decline of twelve points, during August, in the condition of this crop, which followed the drought in the central and trans-Mississippi states. This year the rainfall has been distributed, generally, in accordance with the needs of the crop, although there has been some local excess in sections of the country lying east of the Alleghanies, and deficiencies over small areas in the Ohio Valley. The crop, however, is not entirely out of danger, since the blight appeared during the closing days of August, and the weather conditions since then have been favorable to the development of this disease.

A law was passed during the last session of the California Legislature making it the duty of the County Board of Horticultural Commissioners to inspect orchards, nurseries, or other places in their jurisdiction where they shall deem it necessary, and if such places are found infested with the scale insect, the codlin moth, or other pests injurious to plants or trees, that they shall notify the owner of such a fact, and that they shall request such owner to eradicate or destroy the said pests within a time specified. Such orchards or nurseries are adjudged to be public nuisances, and when their owners shall refuse to abate the same within a specified time it shall be the duty of the County Board to destroy said insects, and the expense thereof shall be a county charge. All such sums shall be a lien on the premises from which said nuisance has been removed, and may be recovered by an action against the property, in the name of the county making such payment, and when the property is sold, enough from the proceeds shall be paid into the county treasury to satisfy the lien and costs, and the overplus, if any there be, shall be paid to the owner of the property.

No. 7 in the "Evolution Series" of pamphlets, published to give permanent form to the lectures and discussions organized by the Brooklyn Ethical Association, is written by Mr. Frederick J. Wulling, and is called "The Evolution of Botany." Its title is somewhat misleading, for it is simply a brief history of the progress of botanical research and knowledge, which closes with a rather forced attempt to prove that this history establishes the truth of the doctrine of evolution. But in itself the pamphlet is an excellent one, supplying an account of the development of the science which, for combined clearness and brevity, we do not remember to have seen equaled. The only faults we have to find with it are, that the exact character of the "natural system" of classification, now universally adopted by botanists, might have been more definitely explained, and that the list of American botanists and explorers might have been drawn up with a keener regard for their relative degrees of distinction. For instance, the value of the labors of Rafinesque, Michaux and Pursh should have been more clearly pointed out than by the including of their names in a list of some dozen persons who have "contributed papers on botany to the various scientific journals."

Mr. C. Wolley Dod contributes to a recent issue of *The Garden* an account of the Madeira Orchis (*Orchis foliosa*), which he finds succeeds well in his English garden, where it is growing even more vigorously than the allied British species, as it is easy to believe from the illustration made from a photograph, and which seems to us to be about as perfect and delightful an illustration of its kind, both in composition and in the exquisite detail with which the wood-engraving has been executed, as we remember to have seen. In speaking of this plant Mr. Dod, who is one of the most skillful cultivators of hardy plants in England, recommends that "it must be planted in a sheltered place in good, moist, open loam or peat, where the soil does not dry up in summer. The shade of trees is not bad for it, provided their roots do not drain the ground too much, but the food of trees and the food of Orchises seem so different that I have seen this plant growing very fine within the limits of the roots of Lime-trees, especially near water where the subsoil is never dry. It seems to like rich feeding, and, though manure is generally forbidden for bulbs of this kind, I find a top-dressing of leaf-mold, mixed with well-decayed stable refuse, very beneficial to growth. August, when the annual growth is completed but before the leaves have changed color, is the best time for separating the bulbs, when they have increased into a mass and want replanting. Neither this nor any other plant ought to be moved when resting. *O. foliosa* does very well in large pots, wintered in a cold frame and moved into the greenhouse to flower, as they are there protected from the very injurious spring winds. Among the variable native Orchises included under the names of *O. maculata* and *O. latifolia*, individuals may be found well worth cultivating, especially amongst those intermediate forms which are not uncommon where these two species grow together."

Catalogues Received.

The Dingee & Conard Company, West Grove, Pa.; Bulbs, Hardy Shrubs and Plants, etc.—B. A. Elliott Company, Pittsburgh, Pa.; "Fall Garden Work," with a List of Plants for Fall Planting.—Peter Henderson & Co., 35 and 37 Cortlandt St., New York, N. Y.; Bulbs, Plants and Seeds for Autumn Planting.—George S. Josselyn, Fredonia, N. Y.; American Grape Vines, Small Fruit Plants, etc.—Jacob W. Manning, Reading, Mass.; Trade List of Hardy Florists' Flowers.—John R. & A. Murdoch, Pittsburgh, Pa.; Trees, Bulbs, Flowers.—Phœnix Nursery Company, Bloomington, Ill.; Wholesale Catalogue of Trees, Plants, Shrubs, Roses, Bulbs, etc.—Pitcher & Manda, Short Hills, N. J.; Special Offer of the Entire Collection of Orchids brought together by Mr. B. Onorato, New Orleans. Price List of Stove and Greenhouse Plants. Descriptive Bulb and Seed Catalogue.—Rea Brothers, Norwood, Mass.; Trade Offer of Hardy Herbaceous Perennials. Appendix to Descriptive Catalogue.—Vilmorin, Andrieux & Co., Paris, France, Theo. Pabst & Co., Sole Agents, 26 Barclay Street, New York, N. Y.; Electrotypes of Original Designs of Flowers, Fruits, Vegetables, etc.—C. B. Whitnall & Co., Milwaukee, Wis.; Bulbs.

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Jeffrey's Pine.

ONE of the interesting journeys that can be made through the forests of North America is from some point in Nevada, like Reno or Carson's City, at the eastern base of the Sierra Nevada, across the mountains into California. The Yosemite Valley can be reached in this way from Nevada by an easy drive of four or five days, during which the traveler will be able to examine the flora of the two sides of the range, and to study, as well as in any other part of the world, the influence of moisture upon the growth of forests. The scenery which will unfold before his eyes as he mounts the eastern slopes will well repay the fatigue and trouble of such a journey; and a more comprehensive and satisfactory idea of the Sierra Nevada and its forests will be obtained than can be acquired in the conventional, and now somewhat hackneyed, journey into the Yosemite from the California lowlands.

The hot, dry barren foot-hills which stretch along the eastern base of the mountains do not offer much that is beautiful or attractive, but when these have been crossed and the real ascent of the mountains begins, a wonderful forest of Pine-trees will be entered. The lowest limit of this forest is rather below 6,000 feet above the sea-level, and it is necessary to climb 3,000 or 4,000 feet higher to see its upper limits. To the person coming from the east for the first time this forest will appear marvelous. Its floor is bare of vegetation, except where here and there a Ceanothus has gained a foothold and spread into a low broad mass of spiny branches, or where taller shrubs occupy the abrupt sides and the bottoms of narrow cañons. The trees stand sometimes close together, and sometimes at considerable distances apart; they are often 250 or 300 feet tall, their great trunks ten or twelve feet in diameter and free of branches, except near the top of the trees. These trunks are splendid; there are not many things more impressive or more beautiful. The bark is immensely thick, and is broken by deep fissures into great cinnamon-red armor-like plates, across which the sunlight, as it flickers down through the scanty canopy above, casts long shadows. The branches are few and small in proportion to the trunks, and bear at their ends great brush-like clusters of pale blue-green foliage and immense quantities of large chestnut-brown cones, which, in early autumn, sometimes completely cover the ground under the trees.

This tree is Jeffrey's Pine, the *Pinus Jeffreyi* of botanists. It is a so-called Yellow or Pitch Pine, and, botanically, is very closely related to the California Yellow Pine (*Pinus ponderosa*). It belongs to a small group of western America Pines, to which the name of "Broken-cone Pines" has been applied, from the fact that when the cones ripen and fall their bases, with a few scales attached, remain on the branches. Jeffrey's Pine, probably, never grows to such an enormous size as the California Yellow Pine, but it is a handsomer tree, one of the noblest of all Pines as it is seen in its native forests, and one of the largest, for only two of the genus grow larger, the Sugar Pine and the Yellow Pine.

Jeffrey's Pine may be recognized by its stout, pale blue-green leaves, which are seven or eight inches long, and produced sometimes in twos and sometimes in threes on the same branch; by the pale glaucous shoots, which sometimes become orange-colored during their first winter, and which, when broken, exhale a pleasant aromatic perfume like that possessed by some plants of the Rue family. The cones, too, distinguish it from its nearest ally, the California Yellow Pine; they are elliptical, purple at first, and only become brown as they approach maturity, when they are from six to ten inches in length, and four or five inches in breadth after the stout scales, armed with slender, strongly recurved prickles, have opened. The seeds are an inch long, with long, rather narrow wings, and usually contain more cotyledons than the allied species.

Jeffrey's Pine, like most trees of wide distribution, varies considerably in habit and in general appearance in different parts of the country. The form, which may be considered a type of the species, as it was the first one known to science, is a comparatively low tree, with a trunk four or six feet in diameter covered with dark bark, and with rather pendulous branches. This is a common tree on the high mountains west of Mount Shasta in northern California, and occurs on the southern and south-eastern flanks of several of the high Sierra peaks in the northern and central parts of the state. On the eastern slopes of the Sierras, where Jeffrey's Pine is found, from northern California to the San Jacinto Mountains, Jeffrey's Pine becomes a larger tree, with red bark and larger cones. For this form Mr. Lemmon, who gives an excellent account of the California Pines in his two reports upon the Pacific coast conifers, proposes the name of Red Bark Pine; in a Pine of lower California he recognizes another form of our species, which he designates as var. peninsularis. "It forms," he tells us, "east of Todos Santos Bay, at an elevation of about 4,000 feet, an extensive forest upon loose débris of white granite, seemingly to cover the region where this rock prevails."

Economically and commercially, Jeffrey's Pine is a tree of the first importance. The wood which it produces, when it has been developed under favorable conditions, is strong and light, although rather hard and coarse-grained. It has been manufactured in immense quantities on the eastern slope of the Sierras, especially in the neighborhood of Donner's Lake and other points convenient to the line of the Central Pacific Railroad. It is this tree which has supplied the timber for the mines at Virginia City and Eureka, and at hundreds of less-important mining-camps. Three-quarters of the buildings which have been erected during the last twenty-five years in Nevada and western Utah are built of the wood of this tree. The demand has swept the mountains bare in many places, and it is still increasing. The climate in which Jeffrey's Pine has grown to its greatest size is one of excessive summer dryness. Trees in such a climate grow very slowly, and

sometimes require centuries in which to reach their full size. Few young trees are springing up on the Sierras to replace the giants as they fall under the axe of the Nevada lumberman. Fires are increasing in number and destructiveness in all this region, and it appears a foregone conclusion that as a national source of lumber-supply the forest of Jeffrey's Pine on the eastern side of the Sierras will have ceased to exist before another quarter of a century has passed.

The discovery of *Pinus Jeffreyi* was one of the results of the so-called "Oregon expedition," an association of Scotchmen who sent John Jeffrey, a Scotch gardener, to the Pacific coast in 1852 to collect seeds and plants. He found the Pine which now bears his name on Scott's Mountain, a rugged range west of Mount Shasta, and in the same region the rare *Pinus Balfouriana*, and, in different parts of California, a number of other plants, including *Pinus Murrayana* and *Pinus albicaulis*. These Pines and some other trees were described and figured by Mr. Andrew Murray, Secretary of the Oregon Association, and by Professor Balfour in a pamphlet of three pages, without a title or a title-page, but accompanied by five plates. It was printed privately and distributed among the subscribers, and is one of the rarest works which have been published on North American trees. A single copy is now known to exist in the United States.

The illustration on page 461 represents a grove of Jeffrey's Pine growing on an elevated spur of the Sierras, above the Yosemite valley. The trees are characteristic of the species as it is found at high elevations and in excessively exposed situations. They are small and stunted in comparison with the great trees which grow at lower elevations on the eastern side of the mountains, where, as we have already said, this species is seen at its best. The illustration is from a photograph made by Dr. William H. Rollins, of Boston.

Mr. P. L. Simmonds contributes to a recent issue of the *Gardeners' Chronicle* some interesting information about the so-called English walnuts, from which the following facts are gathered:

There are many varieties of these nuts, such as the oval, round, double, large and small-fruited, early and late, tender thin-shelled and hard thick-shelled. An almost huskless variety occurs in the north of China. The larger portion of the walnuts consumed in England are of foreign growth, and average in quantity about 250,000 bushels. The bulk of these come from France and Belgium, and small quantities from Germany, Holland and Italy.

Bordeaux is one of the largest exporting ports in the world, perhaps the largest for walnuts; and small quantities are now sent from Chili to Europe. The culture of the so-called English Walnut, which, by the way, is not an English tree at all, but a native of the Orient and of central and eastern Asia, from whence it was early introduced into Europe, is now diffused all over Italy, from the Alps to the valleys of Sicily. It is thought, however, that the number of cultivated Walnut-trees in Italy is diminishing as the demand for the timber is increasing, being in great demand by the cabinet-maker.

Persons with weak digestions will do well to bear in mind Mr. Simmonds' warning, that walnuts, as long as the skin can be easily removed from them, are a nutritious and healthy article of diet; but when they become dry, so that they cannot be easily peeled, they are indigestible.

Walnuts in the shell yield about one-third their weight of picked kernels, which are the crumpled cotyledons or seed-leaves. In some northern districts, particularly in Piedmont, Walnut-trees have always been held in high estimation for the production of oil, which, when newly made, has a very agreeable taste, and can be employed in cookery as well as in the preparation of varnish.

The Walnut grows abundantly in Kashmir, Nepal and other parts of India, where the fruits are largely used. It forms also an important article of consumption in Japan, quantities being eaten in a raw state. They are also much used for making a kind of confection, by cracking and removing the shell without hurting the kernel, which is afterward coated with white sugar, thus making an attractive and agreeable sweetmeat.

The Walnut also furnishes in Japan a bland oil, used for domestic purposes. In China it seems to be pressed for oil, as in some years over 12,000 tons are exported from the port of Tientsin in the year. The Walnut is extensively cultivated in the Punjab, among the Himalayas and in Afghanistan, a large annual supply being brought to the plains of India by the Kabuli and other traders from the hills. There are several well-known forms of this nut met with, the soft-shelled kind of Kashmir and Chamba being considered the best.

The Gardens of Le Nôtre.

THE determining power of fitness, appropriateness, in all periods when art has really been great, the fact that its greatness sprang from its truthful expression of material needs and social conditions, is well shown by the following passage, which we quote from Planat's "Encyclopédie de l'Architecture et de la Construction." What, asks the author, were the architectural requirements of society in the time of Louis Quatorze? "Spacious, richly decorated apartments, in which the court could stand in state while awaiting the passage of the king; in which painting and sculpture should play a secondary, decorative rôle, not the principal rôle as in Italian palaces. In an Italian gallery art was the chief occupant; here it was society; there, architecture supplied a setting for pictures and statues; here, pictures and statues adorned the architecture. French society demanded festal halls and gardens which might serve as open-air drawing-rooms, prolonging the architecture of the noble and stately palaces; gardens embellished with white allegorical statues and colonnades, with trimmed hedges enclosing rooms of living green; gardens furnished here and there with marble stairways, whereon the court could range itself in successive rows; gardens with canals and lakes dotted over with pleasure-galleys bedecked with flags, and with carefully managed perspectives opening in all directions. Under Louis Seize it became the fashion to ridicule these geometrical parterres, these trimmed Yews, these waters trained to spout in complicated patterns and figures, this entire absence of all real nature." But, the author explains, it was much more ridiculous for courtiers to disport themselves in the "dairies" of the Trianon, aping in satin and powder the tasks and amusements of peasants. The main fact is, that the destination of such gardens as those of Versailles "precluded all pretension to rusticity; that their architecture could serve only as a setting or background for the toilets of ladies in grand state and the costumes of men dressed in velvets and brocades; surely damp grass, wet ground, bushes and underbrush were out of the question in the circumstances. . . . In the city likewise, from the street which was still usually narrow and dirty and was nothing more than a way of communication, a lofty porte-cochère gave entrance to a vast court, where a great number of carriages could freely circulate; a noble flight of steps hospitably offered access to a well-lighted vestibule. Galleries with high windows opened, even in Paris, on broad regularly laid-out gardens, which imparted a seigneurial air to the edifice. Studying the old city maps one is struck by the number and extent of these gardens, and their existence explains the fact that so little attention was paid to the plan of the streets themselves."

The Weeds of California.—V.

THE entire tribe of Ragweeds (Ambrosia) is absent from the California list of weeds. The native Franseria is innocent.

Sonchus oleraceus (the Milk Thistle of Californians) and *Senecio vulgaris* thrive as well in California as anywhere in the world, and are found throughout the settled portions of the state. The Senecio will germinate in the middle of the summer's drought almost as well as the Centaureas.

Erigeron Canadense affects chiefly the irrigated lands, and there demonstrates an unexpected resistance to even very strong alkali, such as few useful plants could resist. In Fresno and Tulare counties it reaches easily the height of eight feet, and forms thickets not pleasant to penetrate. In unirrigated lands it rarely becomes troublesome, and is of small stature, but, nevertheless, maintains itself fully where once established.

Cichorium Intybus obstinately retains possession of fields where it has been cultivated, and spreads more or less, but outside of such cases can hardly be considered troublesome.

The *Matricaria discoidea* is extensively diffused in the state, and lines the roadsides all over the Bay country, emitting its pleasant fragrance in the hot sun. *Chrysanthemum Leucanthemum* has gained a foothold in a few localities in the same region, but is not troublesome, and does not seem to spread rapidly. *C. segetum* is found at a few points on the Bay borders.

Of native composites, the Tarweeds are the most objectionable; not so much because of their persistence as weeds as on account of the inconvenience caused by their viscid secretion, both to the person and clothes of the farmer and to certain products. *Madia sativa* is the most generally obnoxious, both because of its almost universal occurrence in fields and roadsides, its extremely abundant secretion and its disreputable aspect when covered with dust. An expensive bath of alcohol alone seems capable of removing the resinous slime from the injured clothes.

Several Hemizonias are hardly behind the Madia in these respects, and several add to it a strong, and sometimes disagreeable, odor; among these the *H. elegans* stands foremost, but this species is not often found in cultivated fields. The *H. luzulæfolia*, on the other hand, exhales a spicy odor of myrrh, which is wafted over the harvest-fields in July and August, and, in a measure, condones the disagreeable qualities of the plant, which really hurts the grain but little, attaining its growth after the crop is off the ground, and then seeding the latter most thoroughly when plowing cannot be done on account of the dryness of the soil. Several other species, however (*H. virgata*, *paniculata*, *Kelloggii*), are not so innocuous, as they grow up very rapidly among the grain while in milk, rendering it impossible to harvest without commingling it with the grain, and then often spoiling both straw and grain with its resinous exsudation. They often form impassable thickets along the irrigation ditches in the San Joaquin Valley.

The Wild Sunflower (*Helianthus annuus*, or *lenticularis*), occurring naturally on rich and moderately moist soils, finds greatly increased opportunities for development when the land is cultivated, and sometimes covers the ground first broken completely in defiance of crops sown. It is not, however, very persistent, and repeated mowing soon diminishes it down to an easily manageable condition. But its complete extirpation is quite difficult. *Helianthus Californicus*, occurring only in low, wet lands, is not very troublesome.

The place held in Europe and the east by the Dandelion is measurably filled in California by several large-flowered species of Troximon (popularly called Dandelions) and Hypochæris, whose feathered akenes fill the air in summer. They hardly invade the cultivated ground, but chiefly pastures and lawns. The true Dandelion (Taraxacum) was at one time introduced as a matter of sentiment by an admirer, but showed such wonderful powers of development that it was with some expense extirpated from the threatened lawns.

Of other composites that invade the fields more generally but without doing any material injury, the beautiful Layias deserve mention. They make the ground gay beneath the half-ripe grain and afterward develop more fully. The *Achyrachæna mollis*, very inconspicuous while in bloom, sometimes forms a dense mat beneath the grain, and after harvest covers the field and fills the air with its beautiful silvery winged akenes.

Matricaria occidentalis invades the grain-fields of the Bay region to some extent, but is not seriously troublesome.

The *Primulaceæ* furnish only the ubiquitous *Anagallis arvensis*, but this attains a degree of development which, from its prevalence in the moist European climates, would hardly be expected. From early spring until the beginning of winter the multitudinous seeds of this little plant germinate, from the surface of moist soil or from the depths of that which is parched and hot, and with a tenacity of life worthy of a better cause. With the two Centaureas, the Stellaria and the *Erodium Cicutarium*, it constiutes a group of weeds that make an exception to the prevalent rule that after the cessation of rains the California farmer may consider the weed-fight over for the season. In the northern part of the state its flowers have the usual dull red tint; in the southern, their color is frequently purple or almost blue.

Of the *Apocynaceæ*, *Apocynum cannabinum* invades pastures from the woodlands in the northern part of the state, but does not become troublesome south of Oregon and Washington.

Asclepias fascicularis maintains a place in cultivated fields of the black adobe character with some tenacity; *A. Fremonti* and *A. eriocarpa*, and locally *Gomphocarpus tomentosus*, maintain themselves in pastures to the occasional detriment of sheep and cattle who are tempted to vary their dry summer diet with something green, and are poisoned by eating the leaves.

Of the *Gentianeæ*, *Erythræa Muhlenbergii* keeps a place even in cultivated fields to some extent, and very commonly in pastures.

Of the numerous Gilias only *G. squarrosa* rises to the dignity of a weed, both in pastures and cultivated fields, where its spinous leaves and bracts, and, above all, the intense odor that has given it the name of Skunk-weed, render it obnoxious. Its viscous tomentum covered with dust give it a forlorn aspect, and one sees with surprise the small blue, star-like flowers amid this mass of dirt, spines and fetor.

Acelia tanacetifolia is the only weed here from the large family of *Hydrophyllaceæ*; its prickly hirsute stem and foliage render it an uncomfortable invader of the fields, and there is no compensation in its dull, yellowish white flower-coils. It does not withstand persistent cultivation.

Among the *Borragineæ*, two native Amsinckias, *A. intermedia* and *A. lycopsoides*, are truly troublesome weeds in the Coast ranges, maintaining themselves on the heavier clay soils which they naturally occupy, despite of cultivation and to the material injury of grain crops, with which in many seasons they share the ground evenly or prevalently. From the clinging quality of their hooked, hirsute tomentum the Amsinckias have received the inappropriate name of Yellow tarweed, although entirely innocent of resinous qualities. The nutlets accompany the bristly calyx on its migrations in the hair of cattle.

University of California. *E. W. Hilgard.*

How We Renewed an Old Place.

XIX.—A WATER GARDEN.

IF one is unable to secure ample assistance, and is obliged to develop a place slowly, the order of planting should be trees first, shrubs second, flowers last of all.

Trees may be considered as the skeleton, the frame-work upon which the whole scheme is constructed, giving it strong substantial outlines and decisive meaning. Shrubbery plays the part of muscles and flesh, covering the unsightly bare places, rounding out the form, supplying the essential, and giving grace and symmetry to the enclosure; while flowers may be regarded as the clothing with which the completed body is finally adorned. Naturally, one cannot resist sticking in a few flowers as he goes along, but their disposition is not final, and they take up a deal of time, and are, consequently, to be relegated to a subordinate place at first, and looked forward to as the occupation reserved for those future unemployed hours when the woody plants can be left to grow and fulfill their mission.

Here, where the watering during summer, and frequent digging about and top-dressing, to retain moisture, are absolutely essential to trees and shrubs, flowers that have to be weeded and tended are much neglected, and only those hardy perennials that will take care of themselves and defy weeds, have as yet any kind of a show. But we are always dreaming of a period when the ligneous plants can be let alone and we can turn our attention seriously to the purely ornamental.

In the mean time, such wild things as come up of their own accord, on the hill and in the meadow, are full of interest, particularly in early spring and in late August, when the stock of hardy garden-flowers runs comparatively low.

At the latter period the little spot that I call my water garden is really quite a sight for such a humble affair, a mere mud-hole as it were, formed by a spring at the foot of the hill, which makes a tiny frog-pond, about ten feet or less in diameter. The frogs themselves are quite ornamental, wearing, as they do, the most gorgeous yellow and green coats, and being quite sociable and friendly, ready to sit on a chip and croak when we pay them a visit, and making music for us in the spring before the birds are fairly abroad. The old bull-frog, with a hoarse cold, is not always a comfort, for he has a way of coughing at night, like an asthmatic old gentleman, that is sometimes distressing, if you lie awake to listen, for it makes you sure his family must be anxious about him, but the piping little ones have quite a cheerful note, which blends agreeably with the chirpings of the grasshoppers.

On the marshy banks of the little pool, which cannot comfortably be reached without overshoes, some slim Willows are bravely growing, which I fear will some day make it too shady for the flowers, but at present they serve to give the spot a cosy and protected air, and the sunlight shifts through the light foliage, and falls kindly on the bright group of blossoms that make it so gay at the end of summer.

The pool is close to an old gray fence, over which the wild vines clamber, and against which the Milkwort, with its stiff stems and smooth leaves, stands up erect, its panicled pink blossom a-top; not a very choice plant, but a sturdy one, and the vivid color "carries" well against the green, and composes agreeably with the masses of Arrowheads that are at this season full of blossoms and tall-stemmed sharp leaves, like a group of Amazons with their shafts drawn to the ear.

At the edge of the pool a mass of sedges has been left unmown, and here are clumps of the creamy blossoms of the wild Foxglove, mixed with all sorts of Golden-rod and some budding Asters, while the flowers of the Grasses are themselves beautiful and various in their own quiet way, some with plumes and some with spears, as if ready to oppose the Arrowheads.

The wild Carraway and the Yarrow show white among the grass, and there is a wonderful rosy hue in the tall spikes of Dock that are blooming near by. The Forget-me-nots are still full of blue blossoms, and spread out into the water far and wide, the earliest to come and the last to go of all the simple ornaments of the water garden.

But the glory of the pool is the Cardinal Flower, of rich dark red, which lifts its bracted racemes proudly and with the dignity of a true hierarch. This shows to advantage for the first time this year, having before fallen a victim to the careless scythe, so that its blossoms, which it persisted in putting forth in spite of discouragements, were only a few inches high. But this summer no mower was allowed to come within six feet of the spot, and we are well rewarded by the glow and stateliness of this superb flower, which would be an ornament to the proudest parterre. The Water-lily bulbs that we got from a nursery in the spring have proved a failure, whether because they were planted too deep in the mud or because the bulbs were defective, it is impossible to say. It may be that the spring is too cold for them, and that they require the warmer water of a pond; but they should not be difficult to raise, for I saw a pink Water-lily blossoming this summer in a rocky pool, with nothing to grow in but the ball of rich mud in which it had been tightly packed before being gently laid in its stony bed.

A picturesque spot it was, with a stream trickling down the face of a high granite rock, that formed the background to a tiny terrace-garden, in proportion to which the miniature brook was a river, along the grassy shores of which minute water plants were growing. A flight of stone steps led down into this terrace, which was banked around with flowers, leaving in the centre a turfed semicircle large enough for an afternoon tea-table and a few seats. Tall Pines waved overhead, and the tops of Oaks and Hornbeams intervened between the garden and the sea, which gleamed whitely between their rustling leaves. On the stone curb of the spring stood a quaint blue water-jug, and a drinking-cup made of a shell and a bit of bamboo. In a corner more rough stone steps led to a lower terrace, also girt about with flowers, from which a rocky winding path led down through the forest to the beach. Ivy clambered over the rocks, and wild flowers and grasses, intermixed with Ferns, hung from the crevices. It was a bit of artistic naturalness that would have enchanted a Japanese, and was the result of a fair woman's skillful planning and fine sense of the picturesque.

But, returning to our own water garden, we find higher up the bank the Hawkweed showing its yellow stars waving on slender stems, and the Prunella displaying its stiff blue clusters, while more Asters blossom, and tufts of Golden-rod cling to the hill-side, and entice us to a climb among the Pines.

Here we find that the dry summer has made havoc. Of the thirty-five planted in April we shall barely save a dozen. This is discouraging, but we have gone bravely to work to set some more, and try whether August skies will be more propitious in the way of rain. We have also put in a few Savins, though we hear they take unkindly to transplantation.

The little Oaks and Maples have thriven, and are showing green against the already withering grass. The soil is yearly improving by letting it lie fallow, and the foot sinks into the soft cushion the uncut hay is making as a covering for the sand and gravel. If it were not for endangering the seedlings, quite a crop could be harvested. It is not soil the hill lacks so much as rain; but the long drought parches and distresses the plantation, and will do so till the trees can shade the ground and preserve its moisture.

The small Chestnut group of which I boasted in the spring has made very little progress, and hardly looks larger than it did last summer. Insects injured the early growth, and there was no later growth for lack of rain. But the trees are alive and healthy, so that we have something to be thankful for. Our one Mulberry-tree bore fruit plentifully, but failed to make much leaf-way. None of these trees were either top-dressed or watered, or they would have done better. It is impossible for us to keep everything in high condition, so that we must content ourselves with the slow progress that nature affords when unassisted. It really seems as if sunshine and water are the prime essentials, and that feeding is not half so important as drinking. With this view, it is hard to understand why it would have upset the economy of nature to have a shower every night in summer, to refresh the fields and gardens of the world. Possibly in time, when the new system of producing rain has been brought down to a fine point, there will be twice a week in villages a pyrotechnic display, accompanied with explosions, that will transform the year into a perpetual Fourth of July.

Seriously speaking, should this new enterprise prove successful, what a revolution man is to produce in nature! To trust such powers to his pigmy hand is dangerous, for the consequences of his personal gratification may be fatal to millions. Fertilize the Desert of Sahara, and you cool off the south of Europe. Alter the temperature of Spain and Italy and southern France, and what is to become of the British Isles? It may be that thus the future of the Dark Continent is to be fulfilled. Migrations southward may begin. Norway and Sweden, like Greenland, may be left principally to the inferior races, while new colonies spring up in lands now tenanted but by the wandering Bedouin or the swarthy Soudanese.

Given new conditions, results are incalculable, and if the rain, as well as the lightning, is to be harnessed to the Chariot of Man, who can tell what disaster shall await the Phaeton who dares to drive such mighty and resistless steeds? Shall he too be hurled to ruin as a punishment for his over-topping ambition; or will he prove master and lord even of the elemental forces from whence he came? What is most sure is, that before they yield themselves wholly to his bidding he must suffer the consequences of his rashness, and win his way to control only by ghastly sacrifice of human life.

Hingham, Mass. *M. C. Robbins.*

Forest-vegetation of the Upper Mississippi.—I.

THE Mississippi River and its tributaries, from Trempealeau, Wisconsin, to Dubuque, Iowa, are enclosed by bluffs varying from 200 feet to 600 feet high. At Dubuque they are much lower than at La Crosse; in the latter place they are something more than 500 feet above the level of Lake Michigan; sometimes they present steep, sandy rocks; in other places they are covered with a dense growth of trees. The region is well watered by numerous small streams emptying into the Mississippi, while it contains a number of streams of good size, as the Wisconsin, Black, La Crosse, Root and Turkey rivers. The smaller as well as the larger streams are well timbered with Oaks, Poplars, Birches, Maples, Hickories, Butternut, Walnut, Plums, Cherries, a few conifers, and, southward, the Coffee-tree and Honey Locust.

Much has been written concerning soils and the character of the vegetation. It is, indeed, a puzzling question, and I doubt whether it can truly be said that certain species strictly confine themselves to certain definite soils, yet certain trees, as well as herbaceous plants, may preponderate in certain soils. Perhaps this may be due to the physical condition of the soil rather than its chemical constitution. The Soft Maple (*Acer saccharinum*) and Black Birch (*Betula lenta*) are the predominating trees in the Mississippi, Wisconsin and Black River bottoms. They also follow up the smaller streams which flow into these rivers, but as soon as these streams are left these trees become rare. The Soft Maple and Black Birch occur most numerously where the lands are subject to overflows every year. Most of the Oaks never occur in such situations, yet the Swamp White Oak (*Quercus bicolor*) is an exception. The only place where this species occurs is in the low sandy and black bottom-lands of the Mississippi and Black rivers. The White Pine only occurs on the sandy rocks or sandy loam soil of the region, always near streams, but in the northern part of La Crosse County it is encroaching on the loamy soil. The Tamarack (*Larix larcinse*) only occurs in cold wet swamps.

The soils of the region may be classed under sandy, loamy, calcareous, alluvial and peaty. The greatest areas of sandy soil occur near the mouths of the rivers. (This is not true for the interior of the state.) These sand prairies are not, however, numerous on the west side of the river. As an illustration, at La Crosse, Wisconsin, there is a sand prairie some eight miles long, and from one-half to three miles wide. The only arboreal vegetation growing on these soils are two species of Oak, Burr Oak (*Quercus macrocarpa*), Black Oak (*Q. tinctoria*), and occasionally the Green Ash (*Fraxinus viridis*) and Black Birch (*Betula lenta*). These trees, however, only occur in close proximity to the Mississippi bottoms. Other sand prairies, similar to this one, occur at Trempealeau and Prairie du Chien, Wisconsin. As regards the herbaceous vegetation on these prairies, it might be said that it is a typical prairie flora. *Liatris cylindrica, Verbena stricta, Baptisia leucantha, Petalostemon violaceus, Œnothera rhombipetala, Bouteloua hirsuta,*

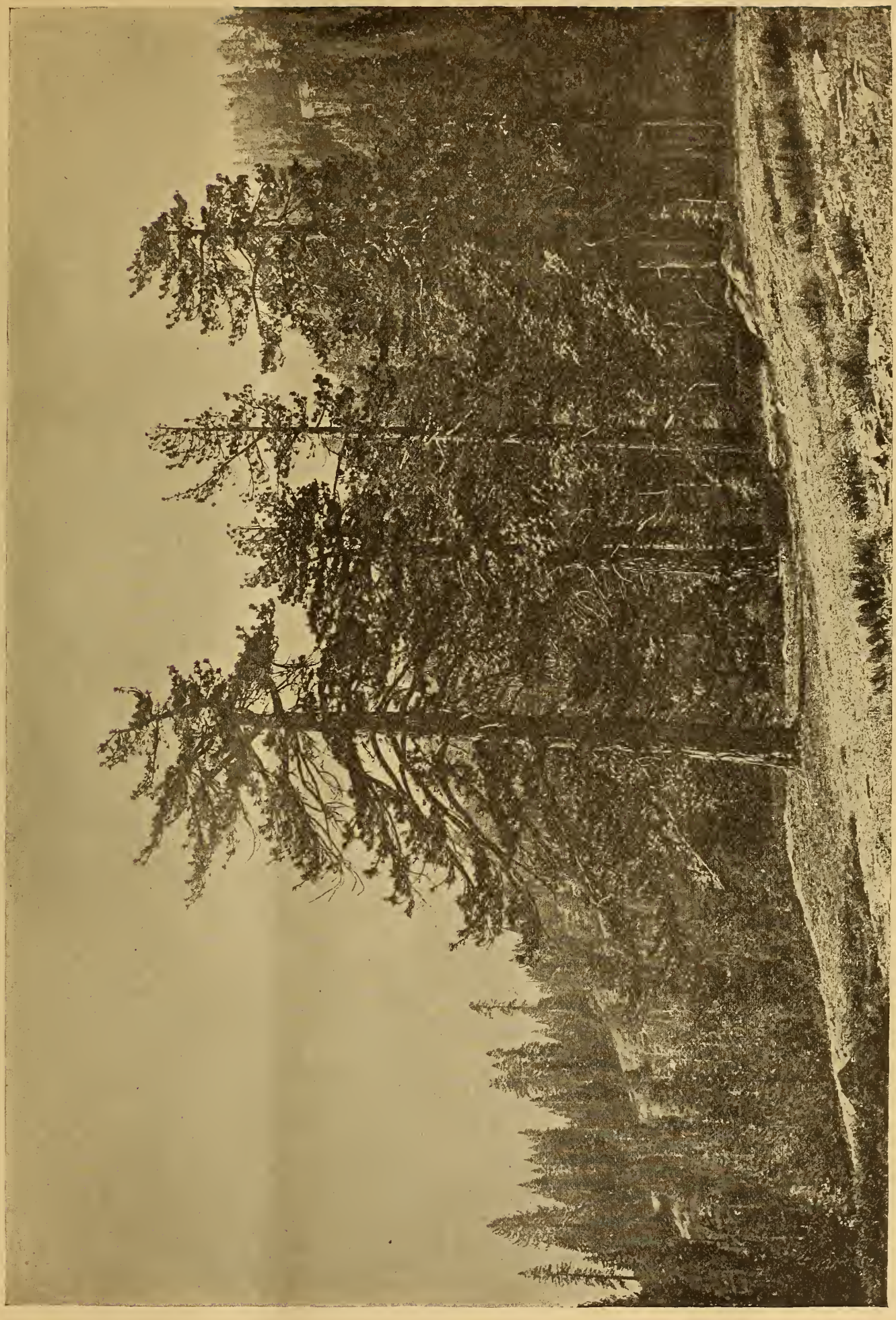

Fig. 73.—Jeffrey's Pine (*Pinus Jeffreyi*) on the Mountain above the Yosemite Valley.—See page 457

B. racemosa, etc., occur very frequently, though the Sand Bur (*Cenchrus tribuloides*) is the most characteristic plant where the soil has been plowed, or loosened by the winds.

The calcareous soils occupy the tops of the hills, and are of smaller extent, near La Crosse, Wisconsin, than Dubuque, Iowa. Birches, especially the Canoe Birch (*Betula papyrifera*), are a most marked feature of it, but this species is by no means confined to soils of this character. Two other plants only occur, so far as I have observed in this region, on the calcareous soils; they are, *Zygadenus elegans* and *Camptosorus rhizophyllus*.

Loamy soils are by far the most abundant; they occur on the slightly rolling ridges and in the valleys. The White Oak (*Quercus alba*) grows excellently in such soil. Alluvial soil does not occupy great areas, except at the mouths of some rivers. The great bottoms of the Mississippi consist mostly of a sandy soil, covered over in some places with a black, rich soil. The White Elm, Box Elder and Soft Maple are common.

The peaty soils are impassable during early spring and summer. Few trees are able to grow—only an occasional Willow or a Tamarack. The bulk of the vegetation consists of species of Carex and Scirpus. Now and then *Lilium Canadense*, *Cypripedium spectabile*, or, here and there, patches of *Drosera rotundifolia* and *Pogonia ophioglossoides*, where the soil is very peaty and wet, appear.

During the past thirty years some important changes have taken place in the growth of timber along the river. The pioneer settler found little timber on the hills, except those with a northern slope. The timber standing on the sunny sides was usually of poor quality, owing to numerous fires. Now these lands are mostly fenced, and fires are kept out, at least by the more enterprising farmers. The bleak hills are being rapidly covered with a forest-growth.

It is not an uncommon thing to observe patches of Hazel (*Corylus Americana*) beyond the outskirts of the timber; here, in course of a few years, will be found Oaks, Birches, Hickories and Poplars. The humus formed where Hazel grows is extremely rich and fertile, and I doubt whether trees could cover our treeless hills very fast without its help

Agricultural College, Ames, Iowa. *L. H. Pammel.*

Recent Plant Portraits.

The following plants are figured in the September number of the *Botanical Magazine:*

Heritiera macrophylla (t. 7192), a large timber-tree of the East Indies, which has long been known in cultivation as the Looking-glass Plant, and forms a conspicuous feature in the Palm-house at Kew with its handsome leaves, bright green above, and opaquely silvery beneath, like the silvering on the back of a mirror. It is a large evergreen tree, a native of the forests of Bengal, Silhet, etc. In India it does not, like *H. littoralis*, with which this plant appears to have been usually confounded, affect the sea-coast or tidal swamps; and it differs from the littoral species in the much larger size of more acuminate leaves, which are also longer-petioled, and in the fruit, which is nearly globose, and furnished with an abrupt flattened beak.

Tulipa Sintenesii (t. 7193); this pretty dwarf species, which belongs to the Gesneriana group and is closely related to *T. undulatifolia* and to *T. Eichleri*, was discovered by Sintenes while traveling in Turkish Armenia to collect bulbs for Max Leichtlin, by whom it has been successfully cultivated and distributed. The flower is two inches long, with nearly uniform, oblong, acute segments, which are dull pale glaucous red outside, bright scarlet inside, with a large black blotch on the claw with an obscure yellow border.

Citrus Aurantium, var. *Bergamia* (t. 7194); this is the so-called Bergamot, or Bergamotte Orange, which is believed to be of a distinct race or variety of the common Orange, although probably better distinguished by its properties than by botanical characters, which are more or less variable. The Bergamot resembles the Lemon in its large light-colored fruit, in the elongated cells of the flesh and in its acidity. The tree, however, is less spiny, the young shoots are green, the petioles are only slightly winged, and the smaller flowers are hermaphrodite, pure white, and fragrant with a peculiar subaromatic odor. "It is one of the three principal races of the Orange proper as distinguished from the Lemons and Limes, the others being the sweet Orange, which is found truly wild in hot valleys of the eastern Himalaya and the Deccan Peninsula; the Bigaradia (bitter or Seville Orange), which, like the sweet Orange, has larger convex surface-glands of the fruit, those of the Bergamot being convex or depressed. There is no record or tradition of the origin of either the Bergamot or Bigaradia, though they may probably have been differentiated in Persia, where the passion for scents being universal, that of a variety or shoot of the Orange differing so greatly in strength and quality of odor as the Bergamot does from its allies, would be sure to attract attention and lead to the propagation of the race. It has been assumed by Gallesio to be a hybrid between the sweet Orange and Lemon, but there are no definite grounds for the assumption."

We learn from Flückiger and Hanbury that the Bergamot Orange appeared in Europe toward the end of the seventeenth century, and that its essential oil was included in a list of the stores of a Giessen apothecary in 1688. The first precise notice of it is contained in *Le Parfumeur François*, printed at Lyons in 1693, where it is stated that the oil is obtained from the juice of a Lemon-tree grafted on the stem of a Bergamot Pear.

Oil or essence of Bergamot is the product for which the Bergamot Orange is cultivated. It is used in perfumery and confectionery, and is extracted by distillation or by sponging the surface of the fruit, or by means of a machine which crushes the skin and thus forces the oil from the glands. The fruit is gathered when still green, in November and December, and from two and a half to three ounces of oil are said to be obtained from a hundred fruits.

The Bergamot is principally cultivated in Calabria, and the manufacture of the oil is chiefly carried on there, and also in Sicily and on the Riviera. The name Bergamot, it appears, is derived from the Italian Bergamotta, a pear; the Bergamotte Pear itself is from the town of Bergamo.

Impatiens mirabilis (t. 7195). "It would be difficult to conceive," Sir Joseph Hooker remarks, "a wider departure from the habit of its genus than this remarkable plant presents. It is an undoubted Impatiens, but, whereas the other species of that large genus are weak, succulent annuals, or low-branched perennials, *I. mirabilis* possesses an erect naked trunk that attains, in its native country, to four feet in height and the thickness of a man's leg, crowned with a tuft of many large, long-petioled, fleshy, spreading leaves, nearly a foot long, from the axils of which spring erect racemes of golden flowers, larger by far than in most other members of the genus known to me, but singularly uncouth in form." *I. mirabilis* is a native of the Island of Langkawi, off the coast of Sumatra, where it was discovered by Mr. C. Curtis, the superintendent of Penang Botanic Garden, by whom it was sent to the nursery of James Veitch & Sons, at Chelsea, where it is in successful cultivation.

Phalænopsis Esmeralda (t. 7196), a now well-known plant in most of the large collections of Orchids, and a native of Cochin China, whence it was introduced into cultivation in 1874. *P. Esmeralda* differs from all the other known species of the genus in its erect, many-flowered racemes, and in the structure of the lip, which is not clawed, and bears no cirrhi, either at the apex or on the disk, but two narrow auricles on the prominent claw, one on each side. The plants described by Reichenbach as *P. antennifera*, *P. Regnieriana* and *P. Buissoniana* are now believed to belong to this species, although they vary a good deal in the size and in the coloring of their flowers.

Cultural Department.

Plums and Plum-trees.

THE Plum crop has been unprecedented in size and quality. The curculio was not as abundant as usual, and I believe that even those who wholly neglected to fight against this pest have had a full crop. This is certainly true of the Lombard and the Damsons. I took special precautions in the way of shaking my trees twice a day, as the plums began to form, and have had an astonishing harvest. The trees would all have broken down but for a system of tying the limbs to poles which were tied at the other end to the tree or to a fence, or rested on the ground. We used all devices to aid the trees, and succeeded in saving them.

I have seventeen varieties in bearing: Magnum Bonum, or Duane's Purple, ripening early in August and continuing to the middle of September. These, in crates, sold so as to bring about three dollars a bushel. They are excellent plums, in size, color and quality, and the texture is good for canning. Their season is late, and they are only good for the table when fully ripe. The Magnum Bonum, after beginning to ripen, if in shaded places, is likely to rot, and one rotting will infect others. Plant them in uplands and enrich the soil. My trees were loaded with superb fruit. Green Gage; this is

the richest and sweetest of plums, and when well ripened on open sunny trees is very beautiful, a ball of gold with crimson cheeks. It is unexcelled for sweetmeats and rich preserves. It melts down too easily to be a handsome fruit in cans. Washington is a handsome, large, sweet plum, oval in shape, ripening just after the Green Gage. It is moderate in flavor, a great bearer, but not a specially good plum for any purpose. It melts down as soon as it is ripe and becomes useless. On the whole it might as well be discarded. Yellow Gage, as I have it, is, in shape and size, a duplicate of Washington, but ripens ten days later. It is of moderate quality and excellent texture for canning and shipping. The color is good, and for table use it is excellent when fully ripe. Lombard, or Bleeker, is ripe with Yellow Gage, that is, from the first of September to the fifteenth. It is large and fine-looking, a reddish purple. No plum is so popular. It is sufficiently solid, and is midway between the tart and the sweet sorts. The tree multiplies rapidly by suckers, and is easily obtained and generally planted. This variety brings less in market than some others because it is so abundant. Robinson is a handsome, small, native plum, yellow-marbled red. It is of about the same value as other native plums. I do not yet find any that equal in quality the best that are of European origin. Wild Goose never bears at all with me. Abundance, a renamed Japan sort (the Botan), is a fine plum and very prolific. Coe's Golden Drop ripens in September, from the first to the twentieth. This is not a firm plum, and it is too small. A tree full will not measure a bushel. Clingstone Damson is an excellent fruit for cooking and preserving. It is round, of medium size and high flavor. It is fit to pick by September twentieth, but is better if left on the trees until October. Shropshire Damson I see no reason for preferring to the preceding, although many do prefer it. It resists the attack of curculios quite successfully and bears solid masses of fruit. The noblest plum of all for home use, and one of the best for market and all purposes, is Bavay's Green Gage. This remarkable plum is an improved Green Gage. It ripens the last of September, is exceedingly rich, and, unlike the Green Gage, is firm. It is very large, averaging with the largest Bleekers. It should become a universal family fruit. It is handsome, and the tree bears well. *Prunus Simoni* is an interesting plum that looks like an apricot and grows on a tree so upright as to suggest a Lombardy Poplar. *Prunus Pissardi*, the puple-leaved Plum, bears fruit of fine texture, the deepest purple-color and very early, ripening the middle of August, and is one of the handsomest.

For home use, I should select Magnum Bonum (or Duane), Bleeker (or Lombard), Green Gage, Simoni, Bavay and Damson. For market it is desirable to have a long season of ripening, beginning with Magnum Bonum and ending with Bavay and Damsons. The custom of sending plums to market in crates, like those used for berries, is now spreading. Packing, heating and rotting are thus avoided, and the fruit is in fine condition for retailing. The profits to the grower are one-third greater, and pay him for all extra care. The plum is a tender fruit, decaying quickly, and must be handled with care.

I have never sprayed my Plum-trees, being deterred by the experience of my friends, who have spoiled the foliage with a solution of one pound of London purple to two hundred gallons of water. This solution I have found admirable for Apple-trees. For Plums I follow the well-tested plan of jarring on sheets twice a day for three weeks. Two boys carry the sheet, which is a large spread of cotton cloth tacked to light poles on the sides, and on one end slit up to the middle, so that the tree stands in the middle of the cloth. A man butts the tree sharply with a rammer padded on the end, to avoid bruising the bark. The curculios fall, and are quickly gathered and destroyed. This is absolutely a remedy, if you begin as the petals fall and continue for between two and three weeks.

Plum-knot is never a necessary nuisance, although it will appear to some extent each year. The knot should be cut off with a sharp knife, always cutting an inch below and above each excrescence. If this were universally done the disease would soon be quite exterminated. The worms inside the soft warty swellings must not be taken as the cause of the knot, but as a coincidence. It is a fungal growth. There are trees wholly given over to the pest, and it spreads to healthy trees. Some varieties are much more subject to attack than others. Worst of all is the English Hesse Plum. This I still grow, but the battle is so constant that I retain but few trees. The cutting should be done twice a year, to be sure it is thoroughly done—once after picking the crop, and again in November, after the leaves fall.

The plum is so very hardy and so useful for canning and for preserving, that it should receive more general planting and more intelligent care. If the two enemies mentioned are attended to, the crop is assured. I have had no difficulty in marketing over fifty bushels at very remunerative prices. The chief point is nice handling and putting into market when exactly ripe, not green, and not over-ripe. Among those I have not named, McLaughlin, Pond, Bradshaw, Peters' Yellow Gage and Spaulding are all fine, as grown by my neighbors.

The Plum-tree is, at best, not long-lived, and new trees should be planted continuously. These can, in some instances, be multiplied rapidly from suckers, as is the case with Bleeker, Green Gage and Damson, if you leave these on their own roots as I have. A Plum-tree exhausts itself by bearing, or is out of health and beauty, in five years. I find that the crop is increased by growing trees quite close together, but the quality is always better on trees grown openly in sunny spots.

Clinton, N. Y. *E. P. Powell.*

The Planting of Hardy Bulbs.

OUR public parks and gardens have shown us for years the possibilities of floral decoration with plants of a bulbous nature. The great majority of these are spring-flowering, and, in consequence, die down early in the summer, and need replacing with other suitable plants. I would like to offer a few remarks upon the culture of bulbs which are really desirable, and, at the same time, hardy in the eastern states.

The best soil for bulb culture is that of a sandy nature, but a stiff clay soil may be used with good success provided a liberal quantity of sharp sand or grit is mixed with it and also placed immediately under the bulbs. I was shown recently some soil taken from one of the bulb farms in Holland, and it was composed almost entirely of white sand enriched by large applications of thoroughly decomposed cow manure, the remains of which, on shaking the bottle, were easily seen on the surface of the heavier sand. It is evident from this example that there cannot be a soil too sandy to grow bulbs successfully, if it is well fertilized and sufficient moisture is assured, until June at least. If the soil is heavy, plenty of sand must be added. Naturally moist soils, with no means of draining, would offer the worst condition for bulb culture, assuming that the bulbs are to be planted, not for one season only, but permanently. I am satisfied that this can be done with the majority of bulbs, with the exception of Hyacinths; but, although these bulbs are perfectly hardy, and will flower for several years, the bloom of the first season will never be equaled.

Of strictly hardy bulbs there is no genus that will give so much real pleasure as the Narcissus, of which much has been already said in the columns of GARDEN AND FOREST. The long lists that bulb-dealers are offering to their patrons, and the number of communications received concerning Narcissus culture, indicate the growing popularity of this flower. In a list recently received from an American dealer the genus is subdivided into the different sections, as in the lists of the large European dealers who make a specialty of the Narcissus. Our experiments with Narcissus, begun last fall, were distinctly successful, as was the large bed of Asters planted between the rows this summer. We shall now give the bed a moderate top-dressing, and shall expect double the quantity of flowers next spring. There has been just one incident to mar the entire success of the plan. A zealous but unintelligent assistant, after removing the Asters from the bed, proceeded to pull up the labels he found there, which, of course, belonged to the Narcissus.

We intend to double our planting this fall. The bulbs were ordered early in July, and August delivery insisted upon, but they have not yet arrived. Directly after they reach us they will be planted in rows six to eight inches deep, and six to eight inches apart in the rows, according to the variety, the rows themselves eighteen inches apart. This allows of hoeing and keeping the beds clean until the annuals are planted between them in summer, when the weeds must be pulled by hand. Writers have differed as to the depth at which Narcissus should be planted, and have doubted the advisability of growing other plants over them in summer. It is only necessary to add that our soil is light, with a gravelly subsoil, and our success has always been certain with deep planting in soils of this nature. I do not anticipate any harm to the bulbs from the planting over them, as their roots are dormant when the other plants are growing, and, in a wild state, they always grow in pastures where they have a perennial covering of herbage above and around them. I have an idea that premature ripening of the foliage, which often occurs here during a hot and dry season, is considerably lessened by the partial shade afforded, both to the soil and foliage of Narcissus, by the summer occupants of the beds. Narcissus are equally good for massing in beds, as is done with Tulips; but for this purpose the commoner kinds should

be used, and these should be planted about six to eight inches apart each way. These need not necessarily be removed in summer, as there will be ample space between them for the insertion of Coleus, Vinca, Geranium, and other bedding plants.

South Lancaster, Mass. *E. O. Orpet.*

The Newer Phloxes.

THE garden Phloxes have lately taken a fresh start in the way of improvement. Many of the newer sorts have individual flowers which are enormous as compared with the best of the older ones, as, for example, Juliet Round and Cross of Honor. Eclaireur has a very dark carmine flower, immensely large and of a rich shade. The plant is dwarf, and the truss as fine as the flower. Bounetain is of a rich rose-color, paler at the centre, and having a ring of a brighter tint midway between the centre and circumference of the corolla. But of all my collection Liberté is most novel, and perhaps most beautiful. The clusters are large, but not the largest, while the flowers are of a deep salmon, with an intense carmine centre. Gold-leaf is notable mainly for its bright yellowish leaves. But we have little reason for indulging in abnormal colors in foliage or encouraging their propagation. Snowflake has large panicles of pure white flowers of the first quality. But of all the whites I have found none to surpass Croix du Sud. The flowers are porcelain-white, with a touch of carmine at the centre, and the plant is decidedly a dwarf. Aurore Boréale has a deep purple centre, surrounded by a shade of orange, and is very effective. General Breart has attractive flowers, which are white, touched with violet and a distinct violet centre. The Nearry has a deep rose-colored flower of the finest form and texture, while the centre is a rich carmine. Richard Wallace is better known. It is a fine flower, white, with rosy eye. Paul Bert, a bluish lilac, with violet centre, is a grand flower. Panama is a noble white, and of the best possible form. Diplomate is a soft rosy carmine, and very satisfactory. Deliverance approaches as near to scarlet at the centre as can be found in any Phlox, while the body of the flower is lilac. Regulus is a dwarf plant, giving fine panicles of salmon, with dark centre of violet shade.

The Phlox is one of our most reliable flowering plants, and is capable, evidently, of still further improvement. Its propagation and cultivation are so very easy as to make it the universal home flower. Its chief drawback is a tendency to multiply shoots and flowers at the expense of size and quality. The plants should be divided every second year. My plan has been to transplant them to a new bed, cutting them away until the root is reduced to a capacity of about three stalks. In the old bed I allow a few roots to send up shoots, which blossom much later. In this way my Phlox season is prolonged until November. Root cuttings make fine plants.

The Phlox requires soil that is strong, but not too highly manured. It must also be mulched thoroughly during the dry season, or the flowers will be unsatisfactory. No other plant on our lawns is so easily affected by drought or by dry weather. I mulch with fine cut grass, or with well-rotted manure, which is mainly sawdust run through the stables for bedding. Next to my Roses, Lilies and Gladioli I place the Phloxes. It is not a good flower for culling, as it has a habit, in vases of water, of dropping very quickly. It is, however, beautiful, fragrant, refined and very floriferous.

Clinton, N. Y. *E. P. Powell.*

Protecting Plants in Mild Climates.

PASSING along one of the streets of Raleigh recently I was attracted by a massive bush, almost a tree, of *Erythrina crista galli*, loaded with great spikes of its gorgeous flowers. It was standing in a smoothly shaven lawn, and looked like one of the oldest inhabitants. As I have kept up my old habit here of lifting Erythrinas and keeping them in a cellar, I was curious to know if this great plant was lifted. On inquiry of the owner I was assured that it had occupied its present place for many years. "We saw it off a foot or more above the ground each fall, after frost has cut the top, and make a mound of saw-dust over it, and it has greatly increased in beauty since we quit lifting it years ago." I am inclined to think that a mound of earth, sodded over, would be an improvement on the saw-dust, and shall try it this winter.

This mounding with earth is a very effective protection for half-hardy plants, particularly if a cover is put over the earth-mound to keep it dry. Amateur gardeners in mild climates frequently lose half-hardy plants that they could save with a very little effort. The Lantana and *Aloysia citriodora* can both be wintered over here by the same treatment our friend gives his Erythrina. A Lantana, trained to a single stem, and pot-grown for a year until the stem gets somewhat woody, will do better for treatment than a young plant set out in spring. Cannas are commonly wintered here where they grow by cutting down the tops and laying them over the bed, but they ought to be lifted each alternate spring, and reset as growth begins, otherwise the rhizomes get so tangled up that growth is impeded. *Canna flaccida* gets to be quite a weed without any protection, and its rhizomes creep under the fences and invade neighboring grounds. It is hard to make our people understand that these tuberous roots ought to be lifted, divided and reset in spring. The fact that they live over without attention in great masses and grow vigorously is accepted as evidence of hardiness, but the scarcity of flower-spikes on these masses shows plainly that the cold has destroyed the flower-germs already formed in autumn. The earthen mound might insure the safety of the flowers, but there is no doubt that the lifting and curing of the bulbs, as practiced at the north and by commercial growers here, is the best plan, even for this section.

For plants with evergreen leaves, like the *Gardenia florida* and the Camellia, we find that the best protection is one that will allow a circulation of air, and at the same time give shade from the early morning sun. Therefore, we stick branches of Pine and Cedar thickly around them, but do not tie them up at all. In the flat, low country of eastern North Carolina these need no protection at all. This same protection with evergreen boughs will always insure the safety of the Fig here. The past two winters have been so mild that there is danger our growers will have so much confidence in the safety of their Figs as to neglect even this protection, and a sudden cold snap may injure the plants, or, at least, destroy the early crop. The cover of evergreen boughs can do no harm even in a mild winter, and will always insure a crop. When the southern people learn the full value of a light protection here our gardens will take on new beauty and productiveness.

Raleigh, N. C. *W. F. Massey.*

Centranthus ruber.—Red Valerian is one of the hardy plants the seeds of which are a regular stock article of the seedsmen, and are offered with much praise and with no qualification. The descriptions are correct, as far as they go, for the plants are neat, strong-growing trailers, covered in the spring with large rosettes of pink flowers. They are not such flowers as one would care to gather for bouquets, but for a wild place, trailing over stones, the plants would be desirable were it not for the unmistakable polecat-like odor emitted by the stems. The smell of this plant is so curious and interesting that I have continued to grow it, though I should scarcely recommend it for general culture, in the endeavor to locate the source of the scent, which seems to hover over the plant instead of being strongly localized in its parts. There seems not only an opening for a chart of colors, but for a scale of scents in describing flowers, since the favorite description of "fragrant" and "very fragrant" fails to convey a lucid idea to the intending grower. No one, for instance, in describing perennial Phlox thinks it necessary to mention the fragrance as that of burnt sugar, which is homely, but exactly describes the odor. Many plants, such as night-blooming Ipomœas and Nicotiana, are found to have the fragrance of the common Datura, a fact which somehow escapes the notice of the trade-writer. However, we are a nation of advertisers, and are accustomed to making the most of our own wares, so that if our friends, the commercial growers, characterize a flower which looks like Canton-flannel as "ostrich-plumes," the proper attitude is not one of irritation, but amused attention.

Nicotiana affinis does not seem to me to be an improvement on *N. acutifolia*, which for some years came regularly in my garden from self-sown seeds. *N. affinis* has larger flowers, and fragrance which is rather Datura-like, but it only expands its flowers late in the afternoon, and during the rest of the day the plants are unattractive. *N. acutifolia* only closes its flowers as they fade, and in this respect is a superior plant in the border. They are such easily grown and effective annuals that they are both desirable where space can be spared, the large leaves requiring considerable room in which to develop properly in true character.

Elizabeth, N. J. *G.*

Cereus triangularis, now in bloom in the Palm-house, was introduced in 1690 from Mexico. The specimen must have been in the garden for a great many years, as shown by its dimension and appearance. It covers the entire roof of the north end of the Palm-house, and I should say it will

weigh from 400 to 500 pounds. This enormous plant had no less than fifty flowers open in one night, and for several nights there were from twenty to thirty flowers open. Unfortunately for visitors the flowers of this and several other of the largest and handsomest Cacti do not open before dusk, and they close again soon after sunrise the next morning.

The flowers, when fully unfolded, measured thirteen inches across the sepals and six inches across the cup formed by the white petals. Lining the inside of the flower are numerous long hair-like stamens, which are bright yellow in color. The fleshy cylindrical style reaches just over the top of the cup formed by the petals, and is divided at its apex into a number of spreading filaments about an inch long. It is impossible to give a description of these flowers that would convey anything like a full idea of their beauty.

The cultivation of the large night-blooming Cacti is not difficult, and I would recommend them for covering bare rafters and walls in large conservatories. In addition to *C. triangularis* there are *C. Macdonaldiæ*, one of the best of the night-blooming species; *C. grandiflorus*, *C. Lemaire*, *C. nycticaulis* and *C. Napoleonis*. All these grow freely, and produce large and handsome flowers which open at night.

Botanic Garden, Cambridge, Mass. *R. Cameron.*

Symplocos cratægoides.—This Japanese shrub, which has found a place in a few American gardens in late years, under the name of *Symplocos paniculata*, is surprisingly beautiful just now. Its branches are loaded with fruit of a bright ultramarine blue, quite different in color from the fruit of any other hardy tree or shrub. The merits of this plant have already been set forth more than once in these columns, but it is unusual to find a hardy shrub, perfectly easy to cultivate, of good habit and productive of handsome flowers and beautiful fruit, and it is always a pleasure to recommend it. Those who have gardens cannot go amiss in adding this to their collections, however choice they may be, or however small the space they can devote to the cultivation of hardy shrubs. Mr. Thomas Hogg has placed us, in America, under deep obligation for several useful and beautiful plants which he was able to send home from Japan at a time when Japanese plants, with a few exceptions, were almost unknown in America and Europe. Among them none has greater value, or possesses more conspicuous and individual beauty than the subject of this note.

Boston, Mass. *S.*

Correspondence.

The Beaver and the Flow of Streams.

To the Editor of Garden and Forest:

Sir,—The most practical methods of retarding the flow of water in the smaller streams, to prevent destructive floods and maintain constant water-supply, is now a pressing question, and a question well worthy of study. Dams on rivers and on their larger tributaries—except at the outlet of lakes—are not to be thought of seriously, for the elements of expense and danger are too great for any extended practical use. The work that has been done in Europe, such as the building of retaining walls, to prevent erosion on the convex side of bends, and the construction of dams, forming basins to hold back the water and catch boulders, gravel and sand, may prove the best devices in a steep, hilly country, with valuable property immediately threatened below; but no two cases will be found precisely alike, and the individual judgment in dealing with such questions will always have ample opportunity for the exercise of practical invention.

Any attempt to give details that will apply to each case will be idle, for such work should always be in charge of men who can invent new plans for the needs of each case. A few suggestions may, however, be in order as indicating the importance of turning to use the forces of nature, when, as so often is the case, these forces, wisely guided, may be utilized to do the work.

A beautiful illustration of such management is found in the fascine dams for retarding water and débris in the rivulets at the remoter sources of streams in Europe. These dams are made by digging a shallow trench across the water-course and bedding in this trench immense bundles of live willow-rods. These bundles are then banked on the upper side, and at once the Willows begin to grow, and a living dam is formed of material that is both effective and self-perpetuating.

To one who has traveled in the primitive woods of North America, these fascine dams at once suggest the work of the beaver, whose dams of willow-fagots and mud, up to four and even five feet high, and sometimes over half a mile long, have formed or increased lakelets, from which the water has filtered in a manner best adapted to the preservation of constant water-flow.

These dams, abandoned by the destruction of the beaver, are now nearly all cut through, and to a great degree rendered of no value in retarding water, yet they remain as historical indices of the past condition of our primitive forests, and no small factor to be considered in accounting for the increased inconstancy of streams which follows settlement in a wooded country. The restoration of this valuable fur-bearing model of industry to its former domain is suggested as a project deserving serious consideration. Such a restoration might be quite effective in retarding water-flow, preventing erosion and soil moisture, and maintaining water-ways, city and mill-supply, at a minimum expense; and this expense the production of valuable furs would aid materially in defraying.

Washington, D. C. *H. B. A.*

Pomology.

Meeting of the American Pomological Society.—I.

THE American Pomological Society held its twenty-third biennial session at Washington on the invitation of the Secretary of Agriculture. As a rule, the society accepts the hospitality of some local organization, but in this instance the gathering was welcomed by the Honorable Edwin Willets, the Assistant Secretary of Agriculture, in the Lecture Hall of the National Museum. During the sessions papers were read by several of the experts connected with the department, and all the material of the department in the way of fruit models, etc., were placed at the service of the society.

The fruit exhibit, which the older members say has not been so good of recent years as it was twenty-five years ago, was very creditable in every way. The state of Virginia, through her Commissioner of Agriculture, showed one hundred and sixty-three varieties of Apples, which represented all the fruit regions of the state, from tide-water to the mountains, and many of them, notably the Albemarle Pippins, were exceptionally good. From Mississippi, Tennessee, New Jersey and many other states there were promising seedlings, and Messrs. Ellwanger and Barry had a very large display of Pears. Of the minor exhibits there was a striking collection of Citrus fruits from Florida shown by the Rev. Lyman Phelps, with some admirable Pines from the same state by Mr. H. S. Williams. President Berckmans exhibited an interesting collection of Japanese Persimmons of all sizes, shapes and colors, and Mr. H. M. Engle, of Pennsylvania, some of the remarkable Chestnuts which he is growing.

A good deal of time was spent on the revision of the catalogue, which is really one of the most important functions of the society, but very plainly it is a difficult matter for a few members in the hurry of such an occasion to pass any such deliberate judgment as they deserve on the merits of fruits and their adaptation to different regions. Mr. Berckmans' suggestion in his address, that this work should be practically done by local societies, under the supervision of the national one, commended itself to all of the members. We give below a few of the more important paragraphs from this address, which was a general survey of the field and a careful record of pomological progress since the meeting of the society in Florida two years ago. The officers chosen for the next two years are Prosper J. Berckmans, of Augusta, Georgia, President; C. L. Watrous, of Des Moines, Iowa, First Vice-President; G. B. Brackett, Denmark, Iowa, Secretary; Benjamin G. Smith, Cambridge, Massachusetts, Treasurer.

THE PRESIDENT'S ADDRESS.

In speaking of the work of auxiliary societies, Mr. Berckmans said:

These local organizations could hold meetings every month, or even oftener if need be, especially during the fruit season, and at these meetings the merits and demerits of fruits could be ascertained, annual reports made to the state society, to which these local societies should be auxiliaries. In this way the

chairmen of state fruit committees could collect more reliable reports than can be obtained where state and district societies do not exist. Our state reports are in some instances deficient in reliable and practical information. To persons unacquainted with the scope of our state reports and their influence in bringing the most desirable class of citizens to their borders, let me say, that one of the main considerations a prospective settler takes in view is the adaptability to successful fruit-growing of any section where he intends to make his residence. The state which gives the most comprehensive and reliable report as to its advantages in these productions will receive the most intelligent, energetic and desirable addition to its population; and that community most exclusively devoting itself to fruit-growing and horticultural pursuits is found to advance more rapidly in everything tending to elevate, refine and enrich its citizens.

In urging the necessity of scientific pomology, Mr. Berckmans argued as follows:

While this society has never deviated from its original object, which is the advancement of the science of pomology, yet the wonderful strides made in the production of fruits make it imperative to give commercial fruit-growing all due attention, inasmuch as the magnitude of that source of production is, in a measure, the result of the scientific work of this society. When we compare the wonderful array of the various fruits with which our markets are now supplied with those of a generation past, well may we feel amazed at the variety and abundance as well as improved quality of our market products. A few years ago many fruits were offered in such limited quantities that the names of special varieties were almost wholly ignored. Strawberries were all strawberries; the Isabella was the only name used to specify a variety of Grapes that could be found, and among Pears the Sugar Top was synonymous to the Bartlett, and every Orange, good, bad or indifferent, was sold as a Florida Orange. Now, on the contrary, the market reports issued by every commission man who values his interests name the varieties of all classes of fruits, and quotations are made according to their value. Purchasers have become gradually educated to the knowledge of the best varieties, and thus inferior sorts are driven out of the market. With these facts in view, commercial fruit-growers are interested in improving our popular varieties of fruits by the most careful methods of cultivation, picking, sorting and packing, and they can increase their pecuniary returns by promoting the advance of scientific pomology.

THE HYBRIDIZATION OF PLANTS.

Professor Charles E. Bessey began a paper on this subject by saying that in the lowest forms of vegetable life the process of reproduction is exceedingly simple—that is, one plant divides itself into two; each new plant divides again, and so on indefinitely. But when conditions are not so favorable, reproduction takes place in a general way as follows: Two of these free-swimming aquatic plants come together and merge their substance into one another—that is, fertilization consists simply of two entire plants, or parts of plants, which fuse into one, and lose their previous identity. This means the simple union of two individuals for the sake of strength and production. The united plant is able to live and resist adverse influences, which otherwise would have destroyed the single plants. The two plants after union become one round body, and this covers itself with a protecting shell, and since the larger the mass is, the smaller, proportionally, is the exposed surface, the united plant needs less covering than the two did before the union, thereby saving both material and force. Thus the union of the two into one mass has saved the life of the individual and has perpetuated the species. This is essentially what takes place in all plants where there is anything like fertilization. The law is, that fertilization is the union of two masses of living matter.

In the fertilization of flowering plants we have the same coming together of individual masses, and as a consequence of the union of the male and female cells, there begins a growth in the young seed which results in the formation of the embryo which is to be found in every seed.

This fertilization—that is, the joining of the substance of the pollen-cell with that of the seed-cell—does not differ in any essential respect from that which takes place in the simplest plant.

The old distinction between crossing and hybridization is one which has nothing like as much importance as at first sight it would seem to have. If varieties differ from species only in degree, then crossing of varieties differs from hybridization of species also only in degree. Furthermore, it is well known that no two animals are ever exactly alike. No two plants are ever exactly alike, even where they belong to the same variety; and therefore when the pollen is taken from the flowers of one plant and carried to those of another there is a slight crossing of kinds. It is not as great as when the pollen is taken from a flower of one variety to that of another, nor by any means as great as when it is taken from the flowers of one species to those of another, but all these differ only in degree.

Whenever crossing takes place the offspring will partake of the character of both parents. This follows as a necessity from the nature of the act. We have seen that in any fertilization there is a union of two plants, or two parts of plants, and in crossing the male organ belongs to one variety or species, while the female organ belongs to another. When these two organs are joined the result is a union of the character of the two varieties or species. In this way the offspring must partake of the nature and characteristics of its parents. It is impossible for it to be otherwise. Now, it has been noticed in the breeding of animals, and to a certain extent in the breeding of plants, that the two parents do not always exert the same influence upon the offspring. In the case of many natural crosses which take place between the wild species of plants, noticeably in the Verbenas, the Oaks, the Willows and others, we have been able to detect this difference with such certainty that it is not at all a difficult thing to tell whether, in the case of any particular cross, the pollen comes from this or that species.

In nature, crossing is accomplished largely through the agency of insects, but when we bring this matter within the domain of horticulture we cannot afford to depend upon such precarious aid. The time is coming when the grower of fruits will as carefully select the parents for his crosses as the grower of fine animals now does. The grower of plants, however, has one advantage over the grower of animals. He need not pen up his plants, he need not grow them in different greenhouses or in different fields. As the pollen of our fruit-trees is always yellowish, there is no difficulty in handling it upon the black point of a hair-pencil. The pencil should be slightly moistened, so that the pollen will adhere to it, and then, when loaded with pollen from one flower, it can be gently brushed over the ends of the pistils of the next one. In order to be sure that the stamens of the flower to which the pollen is brought do not themselves drop pollen to the pistils, it is well to remove them at once by clipping them out by means of a delicate pair of scissors.

This operation is not difficult. It simply requires care in watching for the exact time of the maturity of the flower, and then a very little skill will enable one to place the pollen. The maturity of the flower may be told in the following way. The stamens are matured when they are dropping the pollen. This can be seen by any one at a glance. The pistils are matured when the top stigma has a moist appearance. This moisture is what makes the pollen adhere, so that any attempt at crossing before the maturity of the pistil would be ineffectual.

There can be no question that horticulture will be greatly benefited when horticulturists begin to breed varieties scientifically. It is a well-known fact that the seeds of apples, taken from any particular tree, will produce all sorts of variations. Now, the secret of this is, that the flowers which produce these seeds had been crossed with pollen taken by insects, perhaps, from a dozen different kinds of trees. Furthermore, all our Apple-trees are now of mixed blood, and we know very well what that means, especially in the animal kingdom. Now, careful experiments should be made by members of this society. Suppose that you select two Apple-trees which are not far from one another, and which, for convenience, are not very large. It will be best to select trees of marked varieties. If they are trees which have characters about them which would indicate that they were likely to reproduce their kind and their characters, it would be better still. Now, when these trees are just about ready to flower, cover each one with mosquito netting which has been carefully sewed together, so as not to leave any opening to admit insects. When the stamens on the one tree are just bursting open so as to shed their pollen, take a soft camel's-hair brush, wet it slightly, and carry some of the pollen from certain flowers on the first tree to certain flowers on the second tree. Then carry pollen from the second tree to certain flowers on the first tree. If you remove the stamens from the fertilized flowers it will add much to the certainty of the results. Mark the flowers which you have experimented upon; keep the trees covered with the mosquito-netting until the flowers wither, and then remove it. Carefully note the growth of the apple during the season. Notice whether the flesh of the apple has been changed in any way, and when the fruits are finally

cut up save the seeds for planting. When these seeds have grown, cions should be taken from the young seedlings and placed upon old trees, so as to bring them into bearing at the earliest possible period. It will be very interesting to compare the results of such crossing. If the parent tree possessed marked characters, we should expect to find these reproduced in a modified way in the offsprings.

Similar crosses may be effected between varieties of vines, and it is still easier to secure early returns from the experiments. Cherries, Plums, and even the ordinary small garden-fruits may be experimented upon in the same way. If the members of this society were to plan a series of experiments, each man confining himself to a single one, within the next ten years we should without doubt have some surprising results.

It is by the application of exactly these principles that the breeders of animals have been able to reach the results with which we are so well acquainted. It still seems to us in horticulture rather a theoretical thing when we talk of crossing and breeding in order to produce new and desirable species, but that which has proved of such great value in the animal kingdom will in like manner prove of value in the vegetable kingdom.

The horticulturist of the future, and of the near future, too, will be a breeder of plants, and he will be able, by judicious crossing, by intelligent working for a particular form, to control the results of his breeding.

SUCCESS WITH SMALL FRUITS.

Mr. J. H. Hale delivered an address on this subject. As a first requisite he named a thorough preparation of the soil. Such a recommendation seemed hardly necessary, but in a great majority of cases fruit-growers fail for lack of attention to this fundamental matter. Of course, in the virgin soil of the prairies different treatment is needed from that required in thin and worn lands in the eastern states, but there is the same necessity of deep preparation and thorough drainage, although there is less necessity for fertilizing, which is the second requirement wherever the soil is not absolutely rich. For small fruits, potash and phosphoric acid are the plant-foods principally needed in Connecticut. Wood-ashes is the most effective form in which potash can be used, but in the south, where it can be obtained, the ashes from cotton-hulls is better still. Two hundred bushels of ashes to the acre is not too much, and to this a ton and a half of finely ground bone may be added to supply the phosphoric acid. Ground bone had proved the best form in which phosphates could be applied, but South Carolina rock and other forms of phosphate should be tried. As a rule, but little nitrogen is needed, since the tendency of this is to make a growth of foliage. Of course, in certain instances it is valuable, as, for example, while the Cuthbert and Golden Queen Raspberries will flourish under treatment of potash and phosphates only, the Marlborough, in the same field, would be improved by the addition of a trifle of nitrogen, because it is a feeble grower, and needs strengthening. (In other districts nitrogenous manures have proved essential to the highest success with small fruits.)

It is a great mistake to grow the plants too thickly. It generally happens that from two to three times as many Raspberries, for example, are planted to the acre as can be grown to advantage. They should not be set closer than six feet apart each way, and seven, or even eight feet apart, are better for strong growers like the Cuthbert. Then the berries will be big, bright and firm. Hedge-row culture and matted-row culture is wrong, and the hill system is right almost always. Berries grown in this way will be superior in size, texture and quality, and will yield more quarts to the acre, and, besides, the cultivation will cost less when it is done thoroughly.

Irrigation should be provided for Strawberries, where it is at all possible. The grower cannot afford to take all preliminary care for thorough preparation and painstaking cultivation up to the time the plants bloom, and even up to the time the green berries appear, and then lose all on account of the failure of rain for a few weeks. At such a time the control of a supplemental water-supply is invaluable.

After the crop is grown the marketing demands much thought and study. Fruit-growers often work too hard and think too little. It pays to study fruits as they come into the market and to mark the different styles in which they are offered. Fruit which is nicely topped, but does not run uniformly throughout the package, may sell well for a time, but in the long run that grower is always sure of a market who has his best fruit at the bottom, and who is willing to stamp his name and post-office address on each package, so that the people who buy his fruit will know whom to address when they want more of just the same sort. As an instance of success Mr. Hale cited the case of a man who was careful to select and grade every basket of his strawberries, and in the bottom of each basket he placed a card bearing his name, the name of his farm, with the date and the hour of the day in which the fruit was picked added in stencil, and after all this, in big type, was the legend, "This fruit will cost five cents more a basket than the market price."

The eye of a buyer must first be pleased, and the value of an attractive style of placing fruit on the market cannot be overstated. A strawberry grower in western Massachusetts found that it paid to put a rosebud on the top of each basket in the crate, for these decorated packages would sell when no other ones were wanted. The most certain way of securing a market for fruit is to establish a reputation. A grower must make his name have a positive value. He must persist in careful selection and uniform packing until buyers know that his berries are certainly of the first quality and can always be relied on. A name which stands for all that is best in the possibilities of fruit-culture will always sell the fruit upon which it is found.

After all, the home is the best market for American fruit-growers. The average American family uses too little fruit. Farmers, and even orchardists, rarely have enough small fruit. They say it does not pay to raise berries and they can buy all they want. Really they buy a few now and then instead of having an abundant supply every day. Half a bushel of fruit the year through can be profitably disposed of by the average family every day. Every one with half an acre of ground to devote to the purpose can have enough small fruit for home use. This does not mean a few berries in a corner of a garden, but a full line of the standard varieties of all kinds of small fruits planted in long rows, so that they can be cultivated by horse-power, yielding an assured abundance for the table, for canning, etc. Last year a Connecticut farmer kept account of the fruit which he supplied to his family from half an acre of ground. He watched the markets and charged his family with the price of all they consumed, and it amounted to $365, or more than $700 per acre. This was the actual money value of what the consumed fruit would have cost, but the account makes no mention of the pleasure and zest which the product brought to the table in that household, nor of the beauty of the garden, which was an ever-changing picture for the enjoyment of its owner and his family, nor of the advantages from the healthful out-door habits it encouraged, nor of the delights of tasting new fruits, or the hundred other subtle ways in which a garden ministers to mental and physical health.

NEW AND PROMISING SMALL FRUITS.

The paper of Mr. J. T. Lovett on this subject covered all kinds of small fruits, but we only have space for the following:

But little of interest is to be found among new varieties of the Currant. Fay's Prolific is a success with me, and I hear none but good reports of it from any quarter. North Star gives promise of being a valuable variety, especially for the market-grower. Black Champion is an improvement upon the old Black Naples; the berries are larger and produced in greater abundance. I am told it is of better quality, but to me all the black currants are repulsive, in odor and flavor. The Crandall has some merit for culinary purposes. It is of strong growth, exempt from the attacks of insects and disease and very prolific; but the fruit is too harsh and austere to be acceptable as a dessert-fruit. The berries are exceedingly large, almost equaling in size the Delaware grape, and are decidedly attractive. The claim that a good jelly can be made from it is founded on fact, as I can bear witness.

The Industry Gooseberry has not proved as successful with me as it has in many other places. In Monroe County, New York, and upon the Hudson River, it is giving the greatest satisfaction. I also saw it fruiting in perfection in Atlantic County, New Jersey, the past season. Although the best of the foreign varieties I have yet tasted, it loses its leaves prematurely and fails to ripen its fruit.

The dwarf Juneberries have given considerable satisfaction at the east. The chief complaint has been that the plants do not yield heavily enough, and that the berries and foliage are attacked by a fungus. The variety known as Success is an improvement upon the type in point of size of fruit, quality and productiveness, and has suffered less from the attacks of fungus than the common dwarf variety. It has suffered also to a slight extent. I find the Juneberry much better for canning, pies, etc., than as a dessert-fruit. In its natural state it lacks flavor, but when cooked it is quite acceptable.

Eleagnus longipes is an interesting fruit. Did it ripen in late autumn instead of July its value would be greatly enhanced.

The bush is of low spreading habit, densely clothed with foliage, and it comes into bearing as quickly as a Red Currant. Its yield is simply wonderful, the berries being literally crowded upon the under side of the branches. The fruit is borne upon slender stems about an inch and a half long, of cinnabar color, with numerous small light gray dots, and about three-quarters of an inch long by half an inch in diameter. It is tender and juicy, with one large, long, shapely pointed seed in each berry, but so acid as to render it unfit for use as a dessert-fruit, but useful for tarts—in fact, for all the purposes for which the Cranberry is used.

Notes.

The latest reports indicate that the raisin-crop of California, which has been estimated as high as 2,000,000 boxes, will fall considerably short of that figure.

It is reported that the presence of troops in the Yosemite this year has kept the sheep and shepherds away from the Reservation, and, as a result, there have been but two or three small forest-fires. Such fires are usually numerous in August and September.

It is probably an unusual thing for *Ficus elastica*, the so-called Rubber-tree, grown as a pot-plant, to produce fruit. The fact is worthy of notice, therefore, that a plant in the garden of the Honorable M. P. Kennard, in Brookline, Massachusetts, which has stood out-of-doors all summer, is now covered with its miniature figs. The same plant has produced fruit in previous years.

It is recorded of the isolated Andaman Islands, which have been scientifically observed since 1858, that, between that year and 1866, fifteen intentionally introduced plants and sixty-one "weeds of cultivation" were added to the six hundred species of indigenous origin; and that by 1890 twenty-three additional plants had been wittingly introduced and fifty-six additional ones had established themselves, while four of the foreigners noted in 1866 had disappeared.

Last week the Board of Health in this city seized some grapes because the stems were discolored by one of the copper mixtures used as a preventive of Black Rot. Of course, this caused something like a panic in the market, and the grape-growers on the Hudson, who were already receiving low prices, have suffered severely. We shall be disappointed if investigation does not show that the alarm was groundless. The Bordeaux mixture is certainly harmless when taken in such minute quantities as adhere to the skins of grapes which have been sprayed.

One of the most striking proofs of the advantage which may result to science from the earnest efforts of even "amateur," or partially instructed investigators, is supplied by the history of Leeuwenhoek. At the time of the invention of the microscope, in the seventeenth century, he was book-keeper and cashier in a clothing house at Amsterdam. Fascinated by the attractions of the new instrument, he devoted himself to its manufacture and use, and, despite the deficiencies of his education, made many important discoveries in plant anatomy, as well as in that of human beings, and was the first to point out that difference in the structure of stems upon which the first great division of flowering plants into monocotyledonous and dicoteyledonous is based.

In a book on the "Useful Plants of Australia," written by Mr. Maiden, we read that, with the exception of such as produce timber, these plants are not of extraordinary value. Almost all Australia's medicinal plants come from the northern regions, where species from the Malayan Islands and from the south of India mingle with those that are strictly indigenous. The Eucalyptus, with its 130 species, are the most valuable trees, supplying certain food-products as well as oil and timber. Next in value seem to be the Acacias, the leaves of which furnish fodder, while the bark is extensively used in tanning. The trees are being so rapidly destroyed for these two purposes that efforts are now being made for their systematic planting. Few Australian trees supply good fibres.

At the exhibition in connection with the meeting of the Pomological Society in Washington last week the superior brightness in color of northern fruits was very clearly shown. The apples from Wisconsin could be distinguished from those of the middle states as far as they could be seen, and it would hardly be a figure of speech to say that they fairly illuminated the part of the hall where they were placed. It is fair to say, however, that the season in Wisconsin has been exceptionally unfavorable to the growth of fungi, and this may partly account for the entire absence of all specks and discolorations on the fruit. But, after every allowance is made, the fact remains that apples of such perfect smoothness, clearness of color and delicacy of marking are rarely seen in our eastern orchards. It was remarked by more than one of the visitors that they never before realized how beautiful a perfect apple can be.

Hardy shrubs which are in full bloom during the first week of October are not common in our northern garden. The Sea-shore Groundsel-tree (*Baccharis halimifolia*) is just now in full bloom, and, although not very often cultivated except by the curious, is well worth a place in the shrubbery. It is a tall resinous, or glutinous, shrub, growing sometimes to the height of ten or twelve feet, with dark yellow-green, abundant foliage, and small heads of yellow or white flowers. Baccharis is a genus of *Compositæ*, and its individual flowers are minute and are gathered together in small heads without the conspicuous ray-flowers which make the inflorescence of Asters, Sunflowers and so many other plants of this family conspicuous. The heads are not large, and, individually, not very showy; but they are produced in such great profusion in leafy panicles at the end of the branches, that the plants make a good show at this season of the year. This is especially the case with the fertile one, for in Baccharis the male and female flowers are borne on distinct plants. The tufts of long pure white hairs give to the females an entirely different appearance from that of the yellow-flowered males. Plants of Baccharis grown in good garden-soil will be a surprise to many people who have only seen it in its native sea-beaches, and once seen under good condition its cultivation, no doubt, will become more general.

"We do not realize," says the *American Architect and Building News*, "how imperatively necessary a supply of wood is, or how little we have left to satisfy our increasing needs. The forest-producing area of the United States has long ago been settled as thickly as it is likely to be, and the tendency of population is now strongly toward the treeless, though fertile lands of Kansas, Texas, Nebraska, Colorado and Montana. The people who settle in those states must have houses, and must have timber to build them with, and the railroads which serve them must have perennial supplies of ties. For all these needs wood must be had, even if it is brought from the ends of the earth. We have known building timber to be sent from Boston to Zanzibar, and from New York to Buenos Ayres, and we may rest assured that when our stock is exhausted we shall have to buy more, and shall have to pay the people who have it whatever price they choose to ask for it. So far, the steps which have been taken by the public authority to check the annihilation of the forest-wealth of the country have been hardly more than the feeblest demonstrations of a consciousness of the evil against which they were directed. Something was done to encourage tree-planting by settlers, under the so-called Timber-Culture laws, which provided that a settler who cultivated trees on one-sixteenth of his homestead claim should receive his patent in three years instead of five; but this is a mere trifle, and the unwillingness of Congress to do anything of serious practical significance is curiously shown by the law adopted at the last session, in which it was declared that it is 'important to reserve all public lands bearing forests, or covered with timber or undergrowth, on which the timber is not absolutely required for the legitimate use and necessities of the residents of the state or territory in which the lands are situated.' It need hardly be pointed out that 'the legitimate use and necessities of the residents' in the neighborhood of Government timber-lands have generally required them to plunder and denude the lands to their hearts' content, and will be likely to continue to do so until some much more forcible language than this is used in the public statutes, and officers are assigned to see that the statutes are complied with; and even then, in our opinion, little will be accomplished toward restoring the balance between the production and consumption of timber until private plantations, as well as natural forests, are brought under official supervision."

Catalogues Received.

Currie Bros., Milwaukee, Wis.; Flowering Bulbs, Plants, etc.—Frederick W. Kelsey, 145 Broadway, New York, N. Y.; Choice Trees, Shrubs and Hardy Plants.—Samuel C. Moon, Morrisville, Bucks Co., Pa.; Circular of Exochorda grandiflora.—Schlegel & Fottler, 26 South Market Street, Boston, Mass.; Bulbs for Autumn Planting.—Dr. H. Schroeder, Bloomington, Ill.; Fruit-trees, Grape Vines, Small Fruits, Roses, etc.—Thomas S. Ware, Tottenham, London, England; Select Collection of Bulbs and Perennials for Autumn Planting. Complete Collections of Narcissus, Lilies and Irises. Autumn Catalogue of Carnations, Pæonies, Phloxes, Primroses, etc.

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Government Timber Tests.

IT is an admitted truth that there is too little precise knowledge, even among those who are considered experts, of the technical and physical properties of the more prominent woods that are used as timber in the United States. The country has been so far blest with such an abundant supply of excellent material that every one has been able to secure a kind of wood suited to his needs, so that there has been little practical necessity for studying the nicer distinctions between the various species. Again, wood of the same species varies very largely in its qualities as it is grown under different conditions, and it varies, too, in different parts of the same tree. But the study of these differences can only be made at great expense and by persons of special training, and it is not a matter of wonder, therefore, that our knowledge is no greater. It would hardly be credited, however, by the public that large dealers in lumber, and even inspectors, architects and builders, do not even know, in many cases, what kind of timber they sell or use. A large dealer in a western city, in writing to the Forestry Division of the Department of Agriculture, stated that he was selling Long-leaved Pine which came from Arkansas, but since *Pinus palustris* does not grow there he is probably buying and selling *Pinus mitis* for the true Long-leaved Pine. Not long ago a prominent dealer in Chicago, where millions of feet of southern pine are handled every year, wrote to know how timber of the Long-leaved Pine could be distinguished from that of the Short-leaved Pine, showing that such prominent timbers as these are not well known, even to those who handle them. It is a fact that, owing to the increased demand for Norway pine, certain dealers in the west met the emergency by branding some southern pine as Norway, and the sales went on as before. The ordinary macroscopic resemblance between the woods of some of the different species of Oak is so great that the three of them are indiscriminately sold as White Oak.

Now, it is plain that any help which will enable persons to identify the various woods by an examination of their structure would be of great value to all those interested in the use or the sale of timber, and this is hoped for as one of the results of the investigations instituted by the Forestry Division within this year, since the studies of Mr. Roth, of the University of Michigan, who has in charge the physical and microscopic work, are expected to furnish the means of distinguishing the wood of one species from another even when their resemblance in superficial characters is close. As a result of this there ought to be fewer mistakes and misunderstandings, not to speak of deceptions and frauds which can be practiced in general, while the vital distinctions between the woods of different species are not recognized. This work will be still more valuable in connection with a check-list of the arborescent flora of the country which is now in preparation by the Forestry Division, and which will aim not only to give all the synonyms, both common and botanical, of each species, but the geographical distribution of the common names, because nurserymen, lumber-dealers and others who use these woods are naturally misled by the indiscriminate use of the same name for different timbers in different localities. Mr. Fernow calls attention to the fact that buyers of southern pine in the north are quite uncertain how to order and how to distinguish the three kinds that reach the market here, since the same name is applied to each in various regions; and since the botanists have undertaken to revise the scientific nomenclature it is still more desirable to publish the new names, so as to establish a basis of intelligent communication.

Attention has been directed to this subject by a circular recently sent out by the Forestry Division in relation to the Government timber tests now going on, and which, as is stated with justifiable pride, are the first to be made in so complete a way in this particular direction. In order to make these investigations of the highest utility the material for study must be collected by a careful observer who has the judgment to note accurately the conditions under which the samples have grown and sufficient intelligence and training to make certain determinations on the spot. Dr. Charles Mohr, of Mobile, has been doing this work in the south, and a no more trustworthy agent could have been selected. He chooses trees of each species from a number of localities with different soil and climatic conditions, and from each site five trees are cut up into logs and disks, each division being carefully marked to show its proper position in the tree. Disks of a few young trees, as well as of wood from the limbs, are collected for biological study, so that from fifty to seventy disk pieces and ten to fifteen logs are collected for each species, and a full account of the conditions of soil, climate, aspect, measurements and determinable history of the tree and the forest-growth about it is added to the collection from each site. This is the material from which Mr. Roth makes his studies of the physical properties of the tree. He notes its specific weight, the amount of water and the rate of its loss by drying in relation to shrinkage, the structural differences between the pieces, especially as to the distribution of spring and summer wood, strong and weak cells, etc., and the rate of growth and other biological facts which may help to show any relation between the physical appearance of the tree, its conditions of growth and its mechanical properties. Finally, the logs are shipped to St. Louis, where Professor J. B. Johnson will test one-half of the logs while they are green and the other half after a thorough seasoning, in order to judge of the strength of the wood under various kinds of strain and pressure. Besides the beam tests, fifty others will be made of each tree, or about two hundred and fifty tests for each species and situation.

A few problems upon which this work ought to throw more light are stated by Mr. Fernow, as follows: What influence has seasoning of different degrees upon the quality of wood? How do age, rapidity of growth, time of felling

and after-treatment change quality in different timbers? In what relation does structure stand to quality? How far is weight a criterion of strength? What difference is there in wood of the different parts of a tree? How far do climatic and soil changes influence quality? In addition to the study of these and other problems which will suggest themselves as the work advances, it is proposed to test the influence of continued use upon the strength of timbers by experimenting, for example, with timbers which have seen service in bridges for a given length of time.

We are glad to observe that the American Association for the Advancement of Science has appointed an advisory board to assist in securing improved methods for this work, and co-operation is invited from all other scientific men and institutions, so that this will be made a truly national work. We have been permitted to examine a schedule under which various data are placed on record, and it is very ingenious and comprehensive; and, altogether, we agree with Mr. Fernow that this is the most promising work in which the Division of Forestry has yet been engaged. It is plainly a work worthy of the Government, and, from its magnitude and cost, it could hardly be undertaken by private enterprise. Many of the problems to be investigated have already been made the subject of careful study in the Tenth Census, but we cannot have too many tests to corroborate or check each other. If, therefore, the work of the Government is to be carried on with thoroughness at all stages, it has begun none too early, for some of our most valuable woods are growing scarce, and we ought to know what other kinds are best suited to particular uses, for, as the circular referred to states, the knowledge gained by these tests will enable us not only to apply our timbers to the uses to which they are best adapted, but will help us to supply conditions which will produce these required qualities, and thus direct both the consumer of the present and the forest-grower of the future.

Some years ago something like a panic seized a few city boards of health who had just learned that preparations of arsenic had been used upon potatoes to protect the crop from insects, and there was much discussion about condemning all potatoes as dangerous, unless it could be proved, in each case, that no poison had been applied to them. It was long before this that the insects made their memorable march from the Rocky Mountains to the Atlantic and farmers had been using arsenical preparations for several seasons with no evil consequences. But the city people had not heard of this, and when the matter was brought to their notice the newspapers at once sounded the alarm and the boards of health aroused themselves to sudden activity. There was a fall in the price of potatoes, which caused much loss at that time, but the arsenites are still used, and we hear no more of poison potatoes.

Four years ago we described the method of spraying Grape-vines with the copper mixtures as a preventive of certain fungous diseases which were desolating our vineyards. Without some protection against the Black Rot, the cultivation of the Vine in many parts of the country would be impossible. The use of the so-called Bordeaux mixture has become almost universal, and no one has ever been injured by it. It seems strange, therefore, that the discovery of some copper stains on the stems of a few grape-clusters should have created so much excitement as it did ten days ago. If any growers have been foolish enough to spray their vines after this treatment was useless, or with a mixture of more than the regulation strength, this mistake could have been rectified without so much noise and circumstance. The startling head-lines in the newspapers naturally terrified timid buyers, and the grape market was literally paralyzed.

Scientific men in city health boards should keep themselves a little better informed as to the diseases of plants and the remedies generally used to hold them in check.

Sacred Trees of the World.

The Palm, the Oak and the Ash are the three trees which since times immemorial were held to be sacred trees. The first among them, which figures on the oldest monuments and pictures of the Egyptians and Assyrians, is the Date-palm (*Phœnix dactylifera*), which was the symbol of the world and of creation, and the fruit of which filled the faithful with divine strength and prepared them for the pleasures of immortality. "Honor," said Mohammed, "thy paternal aunt, the Date-palm, for in Paradise it was created out of the same dust of the ground." Another Mohammedan tradition of a later period says that when Adam left Paradise he was allowed to take with him three things—a Myrtle, because it was the most lovely and the most scented flower of the earth; a Wheat-ear, because it had most nourishment, and a date, because it is the most glorious fruit of the earth. This date from Paradise was, in some marvelous way, brought to the Hejaz; from it have come all the Date-palms in the world, and Allah destined it to be the food to all the true believers, who shall conquer every country where the Date-palm grows. The Jews and the Arabs, again, looked upon the same tree as a mystical allegory of human beings, for, like them, it dies when its head (the summit) is cut off, and when a limb (branch) is once cut off it does not grow again. Those who know, can understand the mysterious language of the branches on days when there is no wind, when whispers of present and future events are communicated by the tree. Abraham of old, so the rabbis say, understood the language of the Palm. The Oak was always considered a "holy" tree by our own ancestors, and, above all, by the nations of the north of Europe. When Winifred of Devonshire (680-754 A. D.) went forth on his wanderings through Germany to preach the Gospel, one of his first actions was to cut down the giant Oak in Saxony which was dedicated to Thor and worshiped by the people from far and near. But when he had nearly felled the Oak, and while the people were cursing and threatening the saint, a supernatural storm swept over it, seized the summit, broke every branch, and dashed it, "quasi superni motus solatio," with a tremendous crash to the ground. The heathens acknowledged the marvel, and many of them were converted there and then. But the saint built a chapel of the wood of this very Oak and dedicated it to St. Peter.

The sacred Oaks, it must be admitted, do not seem to have always done their duty. Thus, for instance, a famous Oak in Ireland was dedicated to the Irish Saint Columban, one of the peculiarities of the tree being that whoever carried a piece of its wood in his mouth would never be hanged. After a time, however, the holy Oak of Kenmare was destroyed in a storm. Nobody dared gather the wood except a gardener, who tanned some shoe leather with the bark; but when he wore the shoes made of this leather for the first time he became a leper and was never cured. In the Abbey of Vetrou, in Brittany, stood an old Oak-tree which had grown out of the staff of St. Martin, the first abbot of the monastery, and in the shade of which the princes of Brittany prayed whenever they went into the abbey. Nobody dared to pick even a leaf from this tree, and not even the birds dared to peck at it. Not so the Norman pirates, two of whom climbed the tree of St. Martin to cut wood for their bows. Both of them fell down and broke their necks. The Celts and Germans and Scandinavians, again, worshiped the Mountain Ash, and it is especially in the religious myths of the latter that the "Askr Yggdrasil" plays a prominent part. To them it was the holiest among trees, the "world tree" which, eternally young and dewy, represented heaven, earth and hell. According to the Edda, the Ash Yggdrasil was an evergreen tree. A specimen of it (says Adam of Bremen) grew at Upsala in front of the great temple, and another in Dithmarschen, carefully guarded by a railing, for it was, in a mystical way, connected with the fate of the country.—*Deutsche Rundschau.*

How We Renewed an Old Place.

XX.—UTILITY VERSUS BEAUTY.

On any moderate-sized place, with only a man or two to do the necessary work, there is a constant conflict between what is of present importance and what serves for future adornment.

This is one reason why we like to have as many things done in the autumn as can safely be accomplished at that time, because of all seasons of the year the spring is the one when everything comes at once, and your factotum is more than ever distracted by the various calls upon his time and attention.

I used to wonder why farmers were always behindhand with their work, and, while apparently idle part of their time, were driven to death for about two-thirds of the year; but I have discovered that the weather is responsible for a good deal, first by being cold, and perhaps wet in the spring, so that the ground cannot be tilled until late, and then suddenly sending everything ahead by a few unseasonable days of heat and sunshine. Then there is a skurry for the hitherto impracticable digging of the vegetable-garden, a headlong rush to get the seeds in; the grass, which always interferes at unseasonable moments, demands the lawn-mower, and will not wait a minute. The shrubs that you have been waiting to move until the weather should be mild enough to permit your superintending the operation (one can cope with a piercing east wind for this purpose, but not with a north-west snow-storm), shake off their icicles, and all at once begin to leaf out; in a day or two it will be too late. If there is a tree that you have intended to plant at this season the complications are increased, for setting a tree properly is a work of time, and delay here is dangerous.

The perennials need overhauling and replanting in the flower-garden; the weeds are rushing ahead and choking everything; you want your man to attend to them when he has to be putting in Peas and Potatoes for your future sustenance.

The whole spring is one breathless moment, through which you are rushed helter-skelter, leaving half your needs unattended to; and while you are still endeavoring to catch up with the work, all of a sudden our headlong summer bounces into haying-time, and the hapless beautifier is worse off than ever.

Of what account are trees and shrubs and flowers, or even the ever-clamoring lawn itself, when the fields are to be shorn, and possible thunder-storms lurk low along the horizon? This is the weeds' moment, and they avail themselves of it promptly. Up comes the Chickweed among the Peas and Corn; the flower-garden fairly bristles with Plaintains and Mallows, and the paths are slippery with Purslane. On the lawn the Dandelions begin to intrude, and go to seed when they are only an inch high, lying down deceitfully under the lawn-mower, and poking up their white plumes the minute it has passed, in the most imperturbable manner.

It is of no use to summon any one. "That grass must be cut to-day," or "the hay must be turned, or forked over, or got in, or whatever"—there is no appeal, harvest-claims take precedence, and the weeds nod their heads at each other, and say "Come along!" and life is to them a beautiful holiday.

By the time the last load of hay has been safely stowed away these same weeds have to be coped with, for they have become a forest, and that still further postpones the time when the æsthetic side of your place can really have any consideration given to it. At last, when you do get round to it, it is too late to do anything, and one can only sit down and make plans for another season, which will again be buried out of sight in the rush which is sure of a periodical return.

For this reason August is a month which I delight in, for then there is a moment's breathing-space before the fruit-harvest and the terrible "second crop" are again upon the carpet. It is a good time for grading and sodding before the autumn rains. With care and a ball of earth, some of the hardy shrubs can be moved; if it has been a dry summer, now is the chance to put in some evergreens and to remodel your beds of dwarfs. But no sooner do we get fairly to work, and the general effect begins to improve and ideas to take shape, than the marsh, which usually claims the whole late fall and the months of March and April, puts in an appeal for drainage, and, presto! the men who were engaged in ornamental work are whisked away, and you can only see the tops of their heads above the edge of a pile of dirt, as they burrow their way along an unsightly ditch.

Then come the pears and apples. Your own fruit is a fine thing to have in theory, beautiful to look forward to, something to be proud of, but it is a tremendous burden when it comes. The gathering is an important labor, but taking care of it when it is gathered is infinitely worse. The pears, especially, must be watched daily, turned and selected, and the refuse rejected, till their owner would be happier if he never saw a Bartlett or a Jargonelle again. The early apples, welcome and useful as they are, demand the closest attention, and it is not until the last Russet is gathered and barreled and stowed away in the cellar for winter use, that the amateur farmer can have an easy mind.

Perhaps it would be wiser to choose between ornamental and useful management of a place to begin with, and content yourself with either a farm or a garden, as the case might be; but in this event, though one would probably have better results to show, he would miss much of the fun of the more helter-skelter methods of landscape-practice, as well as the profits of orderly market-gardening, which can never be very successful in the hands of amateurs. There is, however, a sense of profit in your own garden as an accessory, whatever statistics show, which is not to be foregone; and, as to the pleasure of getting trees and shrubs in their proper places, who that has read these papers can doubt that they are a source of amusement and instruction alike, even to the most unpractical of their protectors?

The problems of the old place will continue to develop and add puzzle to puzzle in our uninstructed minds; we may pay dear for our whistle, but we shall have the whistle anyhow. After a few more years of experiment and failure, or success, as the wheel turns, we shall probably come to the conclusion to let the grass and shrubs grow as they will under the trees, and let the rest go, which will, I am disposed to think, be wholly to the advantage of the looker-on. But while some vestige of vigor is left to us we shall think the puzzle part more interesting than the solution, and so struggle happily on, setting for ourselves ingenious examples, to be painfully worked out perhaps to a wrong result. Interest in the place will be less when we can no longer tinker at it to advantage, but to that excitement will possibly succeed the calm enjoyment of those who sit under the tree they have planted, and partake of the fruits of their own vine.

As we look up to-day to the trees, upon whose tops we could look down three years ago, we begin to realize the profit of our labors, and to feel that we may even live to take pride in them. The birds which sing in their branches, and build their nests among the twigs, thank us sweetly for the shelter thus provided, though their harmonious chatter adds to the precariousness of a morning nap. The shrubs expand healthily, the flowers we have planted flaunt gayly, the vines are climbing to the roof-tree. The spot not long ago so desolate and unpromising is now sheltered and verdant. The dull red walls of the house have taken on a mantle of green, as it begins to nestle into the shadow of the up-reaching branches that will, ere long, overtop its chimneys. The raw freshness has largely disappeared, the new place is melting into the old, and in a few years more people will have forgotten, as they so soon do, the former conditions, and will cease to realize the importance of the changes made.

The beauty of stately expanses, of deep solitudes, of extensive lawns, and broad park-like spaces, we can never attain, but travelers on the village highway will look kindly through the overarching trees and say, "A pleasant home is there, and a fair outlook on a quiet scene."

Already the Willows of the boundary stretch up to hide us from the rear. The Pines are showing dark once more against the hill sun-browned by the September sun. Yellow leaves are shining on the Elms and Birches, and the shrill wind streaks the green grass with bright-hued foliage torn from the Maple-boughs. The gay-colored blossoms of autumn flowers gleam from the shrubberies, and the low-declining sun casts long shadows across the turf. Soon will a nipping frost bestrew the lawn with wrecks of summer glory; the birds are gathering for their southern flight; the year is past its prime. A few short weeks of hectic color, and then—the end, the sleep, the long dull silence of winter, the sheets of snow, the chains of ice that bind the earth until her re-awakening.

How swift the silent succession of the months! September seems to tread upon the train of June, it is so quickly here, so quickly gone. The Golden-rod is the first plume of the year's hearse, yet when its earliest yellow feathers wave we burn under the hot breath of summer, but ere they lose all their gold the hand of death is on the grass, and the brown leaves have fallen.

A cold rain patters on the gravel walk, and the branches of the trees are dripping as they hang unstirred. The sky is gloomy and leaden—one vast gray cloud sullenly enwraps the heavens. There is no hope, no outlook; all is sad and drear—rain overhead, a wet earth under foot. Summer has gone; the chill of autumn is here. But hark! what is the murmur? It is the north-west wind blowing his distant horn, and in a twinkling the leaden skies are broken with windows of light. The gray scud whisks up toward the zenith, the wet trees shake off their burden and wave joyfully in the keen breeze. October comes! What though his tramp is over the dead leaves, he comes like a warrior from battle, fresh and strong, inspiriting and brave. "Be not cast down!" he cries, "by the death of fair summer. Bold winter succeeds to the throne. He is a king worth having, and his reign shall restore your vigor, men of the north! and help to make you what you

are! Behind him, hidden by his furry mantle, lurks the spring, and then once more the dead summer shall be reborn, and the world shall be again all blossom and music!"

So, with this bracing note, October passes on, and, cheered by Hope and softened by memory, we leave the old place to sleep awhile, and turn to our winter fire and the companionship of men and books, in lieu of birds and trees and flowers which have gladdened us for half a year.

Hingham, Mass. *M. C. Robbins.*

THE END.

Forest-vegetation of the Upper Mississippi.—II.

THE best Oak growing along the Upper Mississippi is the White Oak (*Quercus alba*). It is not uncommon to find trees with trunks eight to twelve feet in circumference. This species once covered a considerable portion of the ridges, especially on clay soil. The shaded slope on which the snow long remains in the spring is also a favorable situation for it. Young growth of White Oak is rapidly covering situations of this character, which formerly contained no timber. Flattened expansions of the stem are found just underneath the surface of the ground. From these arise a number of trunks. It is not improbable that, before the country was settled, late fires in spring kept the forest-growth down, but after the cessation of fires a vigorous growth started. The timber of the White Oak is uniformly straighter and easier to cut than the Scarlet Oak (*Q. coccinea*) or Black Oak (*Q. tinctoria*). These Oaks grow in more exposed localities, where the soil is drier and vegetation starts earlier in the spring, and for this reason fires usually damaged them more than any of the others. The old timber is usually gnarled and hard to split. The young growth is, however, straight and easy to work where fires are kept out. The soils on which they occur vary considerably. They do well on sandy gravelly soil, as well as on clay and black soil, and even make considerable growth on poor sandy soil. *Q. coccinea* is the more common species, although the forms are puzzling. The Red Oak (*Q. rubra*, L.) is the finest of the Oaks in this region so far as beauty is concerned. The trees are tall and straight, and sometimes yield five cords of wood. It is not an uncommon thing for them to yield three cords. The wood is easily worked, and this is owing largely to the locality and soil where the species usually grows. The large trees were less affected by the early forest-fires than were the Black Oaks. The Red Oak occurs principally on shaded hill-slopes, where the snow long remains on the ground, also on clay ridges and black bottom-lands. Young trees of *Q. rubra* are the most easily recognizable of the Black Oaks when growing in such localities. Smooth bark and straight trunk, with few lateral branches, distinguish them at once from specimens of *Q. tinctoria* and *Q. coccinea*.

One of the most variable Oaks, at least so far as general appearances go, is the Bur Oak (*Q. macrocarpa*). On the sandy soils it is diminutive in size, producing numerous lateral branches. Here it is a spreading tree. On the poor sandy soil between the Black and La Crosse rivers it is the most common Oak. On clay and rocky soil it occurs mainly in small groups. Some thirty miles east of La Crosse, in the Kickapoo Valley, Bur Oak is a most valuable forest-tree. The trunk is straight, with but few large lateral branches. In its habit it is wholly unlike the form growing on sandy or rocky soil. Many trees are ten feet in circumference. It does not grow in isolated groups, but acres are covered almost entirely with this species. It also occurs in the rich alluvial bottoms of various streams. The Swamp White Oak (*Q. bicolor*) occurs only in the bottoms of the Black and Mississippi rivers. A large number of small trees occur near North Bend, Wisconsin. I have observed a few more just below La Crosse. It becomes more common southward; and a considerable number were observed near Turkey River Junction, Iowa. No large trees have been seen, though Mr. J. S. Harris informs me that he noticed some near La Crescent, Minnesota, many years ago. The only other Oak I have seen is *Q. Muhlenbergii*. It occurred in considerable numbers on the south slope of a limestone bluff just west of North McGregor, Iowa.

The most conspicuous Maple is the Soft Maple (*Acer saccharinum*). It occurs everywhere along the Mississippi, Black and Wisconsin rivers and their tributaries. It forms more than one-half of the forest-vegetation of the Mississippi River, but becomes less common as the sources of the smaller streams are reached. It grows where the lands are usually subject to overflow, and the soil is sandy or alluvial. The Red Maple (*Acer rubrum*, L.) is not a common species. It occurs in the interior of the country, away from the Mississippi, on sandy black loam. Although the Sugar Maple occurs in the rich rocky soil along the Mississippi River it is most common in the interior of Wisconsin, away from the river. On the low ridges drained by the Kickapoo River it is one of the most common of forest-trees. The Ash-leaved Maple (*Acer Negundo*) occurs in groups in the richer soils of ravines and bottom-lands. It is seldom found in the bottom proper of the Mississippi River. The tree requires a good soil for its development.

Two species of hickory have only been observed, Shell Bark (*Hickoria tomentosa*) and the Pignut Hickory (*H. porcina*). Both species attain to considerable size. The habits of the trees are quite different. *H. tomentosa* grows on clay soil, usually in groups. *H. porcina* grows on various soils, such as rocky, sandy, and along creek-bottoms. Shaded and moist localities are favorable to its growth, which is much more rapid than that of *H. tomentosa*. The Butternut (*Juglans cinerea*) is much more common than the Black Walnut (*J. nigra*), although both are found on the rocky banks of the Mississippi, and the Butternut is abundant in sandy and gravelly soil along the Kickapoo River, while Black Walnut was not observed in this region. The latter tree is confined quite closely to the immediate tributaries of the Mississippi. Along the Badaxe River and smaller streams about La Crosse it is quite common, but as the sources of the stream are reached it gradually diminishes in numbers. It needs a much richer soil than the Butternut.

Agricultural College, Ames, Iowa. *L. H. Pammel.*

Notes on North American Trees.—XXIX.

MR. A. S. HITCHCOCK, of the Missouri Botanic Garden, sends me the following criticism upon the notes on Piscidia, published in Garden and Forest for September 16th (iv., 435):

"You give to the Jamaica Dogwood the name of *Piscidia Piscipula*. In working up the literature for my West Indian collections I reach a somewhat different conclusion, and should like to consult you about it. It seemed to me that the genus Ichthyomethia, Patrick Browne ("Nat. Hist. Jam.," p. 296, 1756), antedates, and should replace the Piscidia of Linnæus ("Syst. Nat.," ed. 10, p. 1155, 1759), and that the name for this tree should be *Ichthyomethia Piscipula*. So far as I can see, there is no doubt about the identity of the plant. Browne describes it well, and Linnæus quotes Browne's Ichthyomethia under his Piscidia, only he misspelled it. If Browne's genera are to be taken up at all, should not this one stand?"

Mr. Hitchcock's criticism is a sound one. I knew of Browne's Ichthyomethia, but had carelessly overlooked the fact that two editions of his work had been published. The second edition, the only one I have seen, was published in 1789, that is several years subsequently to Linnæus' tenth edition of the "Systema Natura," although there is nothing on the title-page to show that it is not the first edition. Browne's genera have been taken up in many cases by modern authors, and there seems no reason why the name of the West Indian Dogwood should not be *Ichthyomethia Piscipula*, Hitchcock.

C. S. Sargent.

New or Little-known Plants.

Aster Shortii.

OUR North American flora is rich in Asters, Golden-rods, Sunflowers, and many other of the tubular-flowered genera or Composite which produce beautiful and showy flowers. These make this country bright during the autumn months, and give a charm and beauty to our autumn landscape which is peculiarly American, and which the inhabitants of less-favored regions look upon with delight and admiration. Among these plants are many well suited to adorn the garden, and it is always a matter of surprise that more attention has not been given in this country to cultivating them. It is true that they are, in a certain sense, familiar outside the limits of the garden. Many of them, however, are not widely distributed, so that a New England Aster, for example, might be as unfamiliar to an inhabitant of the south or of the far west as it would be to a Japanese or to an Englishman.

Fig. 74.—Aster Shortii.—See page 472.

A collection of all our Asters, or even of a dozen or two of the best, would make an important and most interesting addition to any garden, and its value would be all the greater because many of these plants flower after the first frosts have cut down more tender plants.

Several of the American Asters have already been figured in these columns, and on page 473 of the present issue is reproduced a drawing made by Mr. Faxon of *Aster Shortii*, which, although by no means a new plant, does not appear to have been figured before.

A. Shortii is a native of cliffs and river-banks from Ohio to Illinois and of the states south of the Ohio River, and is one of the handsomest of all our species. The stems are spreading, two to four feet high, and produce great racemose panicles of large bright blue flowers and ample lanceolate elongated leaves.

Like the other species, *A. Shortii* is easy to cultivate; it can be readily transplanted from the woods, and will thrive and spread in good garden-soil. Asters, like many strong-growing perennial plants, give greater satisfaction if the roots are lifted once in every two or three years, divided and reset. In this way a large stock of plants can be obtained in a few years, and the surplus not needed for the flower-borders can be planted by the margins of wood-walks and in other rough places where all such plants flourish and appear to the greatest advantage.

Foreign Correspondence.

London Letter.

Cattleya labiata vera.—An Orchid sale of quite exceptional interest took place on September 18th in the Cheapside auction-rooms. Messrs. Sander & Co. had advertised no less than 500 lots of "the supposed long-exterminated old autumn-flowering typical *Cattleya labiata*, . . from Swainson's hunting-grounds, . . . who actually used its stems in packing his lichens for transport" (vide sale catalogue). The plants are "guaranteed true." A large number of Orchid experts and others interested in these plants assembled at the sale, and from the fact that the plants realized over £1,000 we may conclude that experts were disposed to accept them as genuine. Every Orchid fancier knows the value, interest and beauty of the autumn-flowering *C. labiata* which Lindley described in 1818, founding the genus Cattleya upon it. According to Veitch's "Manual," *C. labiata* was found by Swainson in the Organ Mountains, situate about sixty miles north of Rio, "but where it is believed to have been exterminated many years ago. Although diligently sought for by collectors it has never been rediscovered." Mr. Linden, however, claimed to have rediscovered it in his *C. Warocqueana*, and there are some authorities who declare that some of the forms of this plant do not differ from the old *C. labiata*. And now come Mr. Sander's plants, which are guaranteed to be the true thing. The source of these plants, as well as of Monsieur Linden's *C. Warocqueana*, is a trade secret, but it has been hinted that Rio is nowhere near it. Certainly Mr. Sander's plants have all the characters of the true *C. labiata*, so far as pseudo-bulbs, leaves and sheaths show, but no definite decision can be come to until the plants flower. At present we can only say that there is no reason for doubting the genuineness of the plants, and every Orchid grower will hope that they will prove to be what Mr. Sander properly calls "*C. labiata autumnalis vera*, the queen of Cattleyas." According to information sent by the collector of Mr. Sander's plants they vary in the color of their flowers: "Plenty of whites are among them, and all shades of rose and red." The few plants known to exist of the old *C. labiata* are supposed to have been obtained by division from one or two original pieces, which will account for the absence of any difference in the leaves or flowers of those known in English gardens. But among Mr. Sander's imported plants I noted some with short thick, others with long thin, pseudo-bulbs; some with purplish, others with bright green, leaves, as well as differences in the length and width of the leaf-blades. But they were all alike in having the double sheath or spathe, the valves in which are of the same length. This character is said to be peculiar to *C. labiata vera*.

Arachnanthe Clarkei.—This appears to be by far the easiest to grow and flower of the species of Arachnanthe in cultivation. The genus is made up of the plants previously known as *Esmeralda* or *Vanda Cathcartii*, *V. Lowii* and one or two others not at present known to be in cultivation. The most remarkable of all is, of course, *A. Lowii*, whose gigantic size and long drooping inflorescence, bearing two forms of flowers, make it quite exceptional, even among garden Orchids. But it requires a good deal of space, and even when well treated it does not flower annually. The same remark applies to *A. Cathcartii*, whereas *A. Clarkei* flowers when only a foot high, and, so far as my experience with it goes, it never misses a year. It has the habit and leaves of *Renanthera coccinea*, and produces its racemes laterally. Each flower is three inches in diameter, the sepals and petals spreading, oblong, falcate, fleshy and colored chestnut, with yellow bars. The lip is three-lobed and yellowish white, with red streaks. There is a plant of it now in bloom at Kew with five flowers on the raceme, whereas published descriptions limit the number to two or three. The species was discovered in the Himalayas by Mr. C. B. Clarke, F. R. S., and introduced into cultivation in 1885 by Messrs. H. Low & Co. Mr. R. Pantling, an Indian botanist, who has seen this plant growing in the Himalayas, wrote of it in the *Gardeners' Chronicle*, in 1888, as follows: "It occurs on a thickly wooded crest or ridge, at an altitude of about 6,000 feet, where sun and wind have free play amidst its surroundings, drenched with cool rain and driving mists during the wet season, exposed to a fair amount of sunshine during the remainder of the year and visited by a sprinkling of snow at the commencement of the new year. At this altitude the temperature, during the hottest month of the year, never exceeds seventy-five degrees, Fahrenheit, in the shade, while in the two coldest winter months the thermometer ranges from about thirty degrees to forty-five degrees. As a consequence *A. Clarkei* assumes a much more stunted appearance, and never at any time approaches the straggling length of *A. Cathcartii*. The flowers open in October and last about six weeks."

At Kew the plants are grown in a warm house along with Vandas, Ærides, etc., their position being close to the roof-glass and directly over a water-tank, where the air is always moving, as the tank opens into a cool house as well. They are planted in pots, in crocks and sphagnum, and kept very moist all the year round. *A. Cathcartii* is represented by a plant at Kew about twelve feet high. It is planted against the back wall of the Aroid-house, its fleshy roots clinging to the wall in the same manner as Hoya-roots do.

Stenoglottis longifolia.—This is an easily grown and free-flowering terrestrial Orchid, which was introduced at Kew from Natal three years ago, and has since flowered yearly in the cool Orchid-house. The genus comprises only two species, namely, *S. fimbriata*, a small plant, chiefly remarkable for the conspicuous black eye-like blotches on the leaves; and this new one, of which a figure was published in the July part of the *Botanical Magazine* for this year. It has numerous herbaceous ensiform wavy leaves six inches long, and a central scape a foot or one and a half feet long, the lower half bearing bract-like leaves, and the upper a dense spike of rosy purple flowers with ovate sepals and petals and a lip with a fimbriated apex. After flowering the leaves all wither, and the plant remains dormant until spring, when it pushes up new growths from its fleshy root-stock. It requires plenty of water at all times.

Habenaria militaris.—This is now flowering in the tropical Orchid-house at Kew, and it is so exceptionally bright in color that, despite its dimunitive size, it is quite a great attraction. It was first described by Reichenbach in 1886,

from plants introduced by Monsieur Regnier, of Fontenoy sous Bois, from Cochin China, but it has remained a rare plant. Sir Trevor Laurence possesses about fifty plants of it, and these, when in flower, produce an effect as brilliant as a bed of scarlet Verbenas. The whole plant when in flower does not exceed six inches in height, the erect stem bearing from six to ten fleshy, strap-shaped bright green leaves and a cluster of numerous flowers, which Reichenbach aptly described as resembling in form the flowers of a well-developed *Orchis purpurea*. The lip is the conspicuous feature of the flower, as it is flat, trifid, nearly an inch across, and colored rich scarlet; "no English soldier can boast a jacket of a brighter scarlet than this." As with all Habenarias, this species loses its leaves and goes to rest in winter, pushing up new growth in early spring. It requires a tropical temperature and plenty of moisture all the year round, and for compost a mixture of peat, sphagnum and good leaf-mold. Thrips are specially partial to it, and soon destroy the leaves; to keep them in check it is a good plan to wash the leaves with soap and water about once a fortnight.

Habenaria carnea.—This is a new introduction from Singapore which has just flowered at Kew, and which, from the size and prettiness of its flowers, is likely to become a favorite with those who take an interest in small Orchids. It is not unlike *H. militaris* in habit, but the leaves are shorter and form a rosette at the base of the stem, which rises to a height of about six inches and bears about six flowers which have a clavate spur three inches long, a spreading, flat, incised labellum, one and a half by one inch, and ovate sepals and petals. The color of the whole flower is the most delicate flesh-pink, which fades to almost white with age. The flowers last three weeks. The cultural requirements of this species appear to be exactly the same as those of *H. militaris*.

Kew. *W. Watson.*

Cultural Department.

Early Grapes in the North.

Along our northern border, and across the Canadian boundary as far as the upper St. Lawrence River, the earliest Grapes can be grown with considerable success. The Catholic clergy of Montreal have long cultivated early kinds of European Grapes within their enclosures in and about the city, and have even used them for making wine; but my occasional visits have shown me that it is with the greatest difficulty, and only by the free use of sulphur and other chemical applications, that these foreign Vines can be kept sufficiently free from disease to produce crops of mature fruit. The wealthy people of Montreal have very fine graperies, and at the exhibitions of the Montreal Horticultural Society, which I have many times attended in the capacity of a judge of horticultural and pomological exhibits, the display of house-grown grapes has not been inferior even to those seen at the fruit-shows of the Massachusetts Horticultural Society.

There is a narrow strip of country in Canada, between the northern end of Lake Champlain and the St. Lawrence, where the Concord Grape is successfully grown and ripened. There are even a few commercial vineyards on a moderate scale in that vicinity, but by far the greater portion of the native grapes sold in Montreal are either from the United States or from the south-western part of the province of Ontario, which is an excellent Grape region.

In Vermont the whole shore of Lake Champlain, together with the several islands in the lake which constitute the county of Grand Isle, produces good grapes. It was here that the now fairly well-known Vergennes Grape originated. This grape is fully as late as Concord, yet it is esteemed not only for its very good quality, but also as one of the best keepers. But beyond these low-lying water-side regions, on both sides of the international boundary, the climatic conditions change. A late spring and early fall frosts materially shorten the growing season; and although the vines grown among the hills are much more healthy than elsewhere, it is useless to plant any but the earliest varieties, and these only in warm sheltered spots open to the south and protected from cold winds. Along the shores of Lake Memphremagog, the surface of which is upward of 700 feet higher than Lake Champlain, only forty miles away, there are many nooks well suited to Grape-culture, although very few of them are yet so occupied. In such spots even the Concord often perfects its fruit, but only where the water keeps off the September and early October frosts. I have been experimenting with Grapes in this region for twenty-five years, and have been successful with several varieties, though I have never been encouraged to plant them on a commercial scale in competition with more favored localities.

Soon after I began, the late Dr. Grant, of Iona Island, in the Hudson River, introduced his Eumelan Grape, and my first plantings were chiefly with this, the Delaware, the Israella, the Hartford and the Salem. Since then I have added the Tolman, the Brighton, Moore's Early, and recently the Green Mountain and Diamond, but from the Diamond I have not yet received fruit, though the vines have made a good growth. Perhaps a few notes on these varieties may interest readers who are cultivating grapes under similar conditions.

Hartford is the oldest and best-known of these early grapes. It is hardly in advance of the wild type, and the feeble attachment of the berry to its stem as it ripens robs it of what little value it might otherwise have. Eumelan is a very strong grower, making an immense quantity of wood and requiring a great deal of summer pruning. It is early and fairly good, but the clusters are imperfect. Israella is of about the same season as Eumelan; it is a more moderate grower, with good clusters of fruit that holds well to the stem. In quality it is quite good, but I have not found it as productive as it was supposed to be. Delaware is all that one could ask for in a grape of its class, but its thin foliage makes it the easy victim of the thrips, which is the only enemy that attacks my Grape-vines, and for which I find no perfect remedy. The insects make this small grape smaller, and, by injury done, the foliage retards ripening. Still we get a lot of Delawares nearly every year.

Salem is, with me, one of the earliest and surest to ripen. It is unlike other grapes, in being quite eatable before it is fully ripe; and it is also a long keeper, improving in quality to the end. If it had a good cluster, it would be the king of American grapes. I want to protest vigorously against the common practice of selling the Agawam grape under the name of Salem. Quite often I have been taken in by dealers in the city, for the two are strikingly alike in the basket, but with no other resemblance. Tolman is simply a wild grape, very early, good for making a jelly to go with meats, but for every other use valueless. I could grow them by the car-load more cheaply than currants, but I do not. Moore's Early is as detective in its clusters as Salem, but I hear that it does better with long training and age. It is what the street-dealers in Boston call it, an Early Concord. Brighton is a grape of peculiar habit; it is early in a hot season, but in a cool one it does not even begin to color—that is, it requires a higher average temperature than it gets in the mountains to be an early grape.

Green Mountain has fruited finely for me for the first time, this year. I saw it when shown for the first time at the meeting of the American Pomological Society, in Boston, four years ago, and was much struck with it. I must set it down as being as early as Tolman and as good as Delaware, with a much larger berry and cluster. For home use I put it at the head for the cold north, but I fear it will not be a success as a market grape, except, perhaps, for a near market, because of its tender skin and weak attachment to the stem. Otherwise it is as near perfection as I expect to see in so early a grape.

Newport, Vt. *T. H. Hoskins.*

Planting Hardy Bulbs.

When it is desired to mass Narcissus for color effect, as in flower-beds, it is obviously necessary to plant those kinds together that will be in flower about the same time. The flowering season lasts over a much more extended season in Europe than in America, owing to the more gradual approach of the spring season. With us Narcissus-flowers can be counted on in two weeks after the frost leaves the soil, and the different varieties may be had in abundance for about a month if the yellow kinds are used. The white varieties of the Poeticus section extend the season two weeks longer. One who wishes to plant yellow kinds can select a few of the most reliable kinds, like Princeps, which is cheap, early and good. *N. obvallaris*, the Tenby Daffodil, one of the best for any purpose, with *N. rugilobus*, *N. incomparabilis* and its variety Stella, which has white perianth and yellow crown, and *N. spurius*, the Trumpet Major of catalogues, are well-tried and reliable varieties, and we were much pleased with Ard Righ (Irish King) last season, although it is hardly cheap enough

yet to enable us to use it in quantity. All these flower early, and are suitable for naturalizing.

Of the Poeticus varieties, of which there are now many, a very interesting bed might be planted, the first of which to flower would be the variety Angustifolius, which, with us, is two weeks earlier than any other. Next comes Ornatus, followed by Poetarum, a variety with a rich orange-scarlet eye, a very desirable and cheap kind and distinct from all others. The typical *N. poeticus* is followed by Majalis and Recurvus, which flower in May and last, here, until after Decoration Day, when they are often invaluable to florists. The Poet's Narcissus are elegant when naturalized in grass or under trees. They never deteriorate under these conditions, and I have never yet found any reason to complain of flower-buds failing to develop, although I have often heard this lament from others. When planting for naturalization it is best to do so by taking out a good breadth of soil, about six inches deep, and placing the bulbs on the ground. The soil should then be filled in, and, when leveled, a little grass-seed should be sown over it and all will be well.

While the above-named kinds are all easily procured, even by those of moderate means, there are varieties which are much more expensive, and many of them are very beautiful. Among these are the hybrid varieties raised in gardens, such as Horsfield's, which have never yet been equaled, and for which we are indebted to a Lancashire weaver, John Horsfield, whose name will be perpetuated for many a year by this striking flower, with its creamy white perianth and its rich yellow trumpet. *N. Horsfieldii* will never be cheap, although it is a kind which every one wants and ought to have. Grandee, or Grandis, belongs also to the Bicolor section and is a noble flower, as is also Empress and a kind known as Maws Bicolor. We were much pleased with *N. bicolor præcox* last season; it was the earliest plant of the Bicolor section to bloom, and was quite two weeks earlier than Horsfieldii. It was in the vanguard with *N. pallidus præcox* and Ard Righ.

Of the Trumpet Daffodils, Golden Spur is among the earliest and a very fine flower, and with the true Maximus, Henry Irving, Princeps, Countess of Annesley and Obvallaris should be planted by all, if only one bulb of each variety. The latest of the Trumpet section is Abscissus, or Muticus, and desirable on this account, while Emperor is well described as a magnificent flower, and it has proved perfectly hardy with us and is increasing threefold. There is this satisfaction in growing Daffodils, that where one plants a bulb at least two, and often three, may be found the following year. There never was a more profitable bulb grown by dealers than Sir Watkin, which is surprisingly prolific, but many are disappointed on first seeing it flower; indeed, there are many better ones.

Of the Swansneck section of drooping flowered Narcissus, some are very elegant, and most of them are nearly white. Among the best are Leda, William Goldring, Pallidus Præcox, Cernuus Pulcher, and *N. moschatus*, a lovely white variety. All the above varieties are found hardy here, and can, no doubt, be grown almost anywhere in the United States. We have planted forty-two kinds this fall, and hope to be able to report later as to their behavior here. There is no end to varieties, but if one only chooses the most distinct of each section to commence with, the others can be added as time goes on and the love for them increases, as it surely will.

South Lancaster, Mass. *E. O. Orpet.*

Wintering Aquatic Plants.

THE exceptionally warm weather prevailing in September has this season extended the usual flowering period of the Nymphæas, and at the end of the month the tender varieties are still opening. The change of weather, which may be expected any day, will, however, quickly destroy the beauty of the water garden, and arrangements must be made to winter over the stock in safety. There is little difficulty with the hardy Nymphæas, which can be left where they are if planted so deeply that the rhizomes will not freeze; or the tank may be emptied of water and filled with a good depth of dry forest-leaves. If these are covered with boards to keep out wet, they will furnish sufficient protection to hardy Nymphæas and Nelumbiums. Where the rhizomes are planted out in boxes these may be lifted and stored in a cool cellar just free from frost, the only precaution necessary being that they do not become entirely dry or be subjected to too high a temperature. These deciduous species need an absolute resting period, and excitement of warmth at that time seems to be fatal. It is said that the hardy Nymphæas will not survive in the tropics, owing to the impossibility of giving them the needed rest.

The tender species, not being deciduous, may, in the shape of tubers, be wintered successfully in damp moss in a moderate temperature, but strong plants, such as occupy the water at this season, are difficult to keep unless one has a warm tank. If exposed to a low temperature at any time they suffer a serious check, from which they seem unable to recover. In a tank with the temperature at sixty degrees, and not going below fifty degrees, Fahrenheit, they will winter safely and will make no headway. If no tank is otherwise available, a temporary one may be made on a greenhouse-bench, which will suffice to keep them in health. It is well to house the tender species before they suffer a serious check, and they are seldom safe outside in this latitude after the 20th of September.

Elizabeth, N. J. *J. N. Gerard.*

Primula floribunda.—I first saw this pretty little Indian Primrose in England at the Birmingham botanic gardens in 1883. I was struck with its neatness as a pot-plant, but not until last year had I succeeded in growing good specimens of it. I find, however, that few of my gardening acquaintances are willing to accept my estimate of its value. In the growing stage it has long, soft, rugose, hairy, strap-shaped leaves, resembling the common Primrose, and recurving in the same way. The flowers are a soft canary-yellow, produced in great abundance, in successive verticals, during January and February, and lasting fully two months in good condition in a cool greenhouse. My employer considers it a first-rate window-plant, especially on account of its color, which is rare among pot-plants at that season of the year. It is easily raised from seed, and, although biennial in character, if the flower-stems be cut away just after blooming, it will produce suckers which make just as good plants as seedlings, and with less trouble. It succeeds best in a heavy loam, in partial shade, and the more water it receives the better it appears to grow; from this I imagine it to be a swamp-plant in its native country.

Primula denticulata, and some of its varieties are exceedingly handsome and make excellent pot-plants, although they are not so well adapted for greenhouse culture. They are hardy in this latitude, and bloom out-of-doors in early spring. As greenhouse plants for conservatory decoration they do not come in well until the end of February or March. It is not advisable to force them—better to keep them in a cool greenhouse and let them come along slowly. When forced, like many other hardy plants, they have a soft look, easily fade, and are generally unsatisfactory. This spring I planted a batch of seedlings along with my English Primroses, but evidently they do not stand the sun so well, and, therefore, many died. I have, however, a nice stock of smaller plants left which I intend to winter over in a cold frame and plant in spring in a shady place. Several varieties have been named, as, for example, Cashmiriana, Alba, Nivalis and, possibly, others, but in a batch of seedlings it is easy to find any and all of them represented, as this plant varies as much from seed as the common Chinese Primrose. It will grow well in a good rich loam and bloom the second year from seed.

Early Chrysanthemums.—Much complaint has been made of the difficulty of growing good specimens of the Madame Desgranges (white) and its sport, C. Vermig (yellow). As with most other Chrysanthemums, the difficulty is to retain good healthy foliage. Last year I had a fair specimen of the white variety, but it was not so satisfactory as this year. I started in the spring with two plants, one of each variety, and to get additional stock had to take late cuttings from them. These are now in nine-inch pots, and far neater and better-looking specimens than the original plants. It would appear from this that Madame Desgranges had better be propagated late. My plants have been grown continuously under glass, along with several others, some of which have not been so satisfactory as I expected. These were mostly good varieties, which had done poorly for several seasons, and I had hoped that in the greenhouse they would do better. Some have done so, but others have been thrown out as failures. Can some one tell me what to do about a lively green bug that is spoiling the buds of my leaders? They wilt, and eventually go blind.

Cyclamen Persicum.—Gardening has always been a specialized art, and is becoming more so. The private gardener is expected to succeed with everything, but this is impossible. He finds some plants with which he can do well without trying, and others which are constant failures, no matter what his efforts. I had never succeeded well with Cyclamens until this year. What I have hitherto done has been to sow seed in spring and grow along my plants in small pots, ripen them off and bloom them the succeeding year. This year I sowed in December, and have kept my plants growing ever since. They are now larger and handsomer plants than any of my two-year-old

plants ever made. Every other year I have prepared a frame in a partly shaded position out-doors, and watched them very carefully. This year, for lack of time and convenience at the right time, they were left, just after final potting, on the north bench of a greenhouse, and seeing they commenced at once to grow nicely I left them there, and they are doing admirably. My gardening acquaintances say the plants would have done better in a frame. I reply, "Nothing succeeds like success."

Wellesley, Mass. *T. D. Hatfield.*

Hollyhock Diseases.—The Hollyhock has suffered for the past few seasons from at least three fungal diseases. There is the leaf-spot fungus, *Cercospora althæina*, Sacc., that is widespread and very destructive, particularly to the foliage in early summer, causing it to become covered with dead specks, from the size of a pin's head to that of a pea, and frequently entirely defoliating the stems about the time the blossoms should appear. The Hollyhock rust, *Puccinia malvacearum*, Mont., while comparatively new to this country, is spreading rapidly throughout the whole United States. This develops upon leaves, petioles and stems, causing all parts to sicken and die. Still more recently found is the leaf-blight, *Colletotrichum malvarum* (B. and C.), South, but it is making its presence felt in the propagating bed, where it ruins foliage and stems, and is preventing many growers from raising the Hollyhock. Last of all, and the form about which this note is particularly written, is a second form of leaf-spot, *Phyllosticta althæina*, Sacc., entirely different from the first one mentioned, in general appearance as well as in microscopic structure. The only place in American publications where the species is mentioned is in the *Journal of Micology*, where, under *Septoria Fairmani*, E. and E.—which, by the way, is the fifth and last injurious fungus of the Hollyhock found in this country—Mr. Ellis states that on the same leaves was a Phyllosticta which agrees well with *Phyllosticta althæina*, Sacc. This species occurs in northern Italy and France, and it would be interesting to know how this pest found its way across the sea, provided it is not a native here upon some one or more of our wild Mallows or Mallow-like plants. This leaf-spot is quickly recognized by the naked eye by the large brown patches, an inch or more in diameter, upon the leaves, the centres of which are usually broken away, thus presenting large ragged holes and a dilapidated appearance.

Rutgers College. *Byron D. Halsted.*

Recent Publications.

THE latest bulletin issued by the Horticultural Department of the Census Bureau relates to seed-farms, and has been prepared by Mr. J. H. Hale. Seed-production, as a business, has been carried on in this country for more than a century, although before the year 1800 there were but two seed-farms in America, one established in Philadelphia in 1784, and the other at Enfield, New Hampshire, in 1795. In 1820 there were but three such farms, and in 1830 there were but six, and of the 596 that were reported during the census year, containing a total of 169,851 acres, more than one-half had been started since 1870. These 596 farms are devoted exclusively to seed-production, but besides them there are many test-gardens and farms, which are conducted by extensive dealers in seeds, where new and old varieties are grown side by side for purposes of comparison. In such farms, too, are tested all the seeds handled by the dealers who import their supplies or contract with farmers in favored sections of this country to grow such varieties of seed as are adapted to their particular locality. Besides this, there are many farmers who grow one or more varieties of seeds every year in connection with other farming operations, so that their product has not passed into record. This means that the total amount of garden-seeds produced in the United States is much greater than is shown in this bulletin as the productions of the seed-farms proper. One dealer, for example, reports that he supplies farmers annually with 1,000 bushels of peas and 2,000 bushels of beans for planting, and then buys back all the seeds that can be grown from this stock, or about 10,000 bushels each of peas and beans. This is only one of many contracts, so that it is plain that the garden-seed business on this basis has become an important feature in the agriculture of the country. It should be remembered, also, that most of the seed of grains, cotton, tobacco and staple crops of this sort, which are used upon the farm, is either of home or neighborhood production, where it can be readily exchanged for other products. In nearly every other county, however, there are one or more farmers who, by careful selection of seed stocks and better methods of cultivation, secure greater returns than their neighbors, and are able to dispose of part of their productions for seed purposes at advanced rates. Of course, these men are not classed as seed-farmers, and it would be hardly possible to estimate what proportion of their crops are sold for seed, and yet Mr. Hale assumes that one-third of all the small grains, corn, potatoes, tobacco and cotton seed planted in the country is produced in this way. Besides, there is annually sold for seed more than a million bushels of selected grains of standard varieties, very little of which is produced on the regular seed-farms, and the same is true of Grass-seeds, which are produced in enormous quantity in many of the states.

Nearly one-half of the seed-farms are in the north Atlantic division and they average 185 acres each, while in the north central division there are 157 farms, with an average of 555 acres each. The seed-farms of Massachusetts and Connecticut average 142 acres each, while those of Iowa and Nebraska average nearly 700 acres in extent, and several of these farms embrace nearly 3,000 acres each. Some of the details of the tables are interesting, as, for example, those giving the yield per acre of the different varieties of seeds. In several states beet-seed is produced at the rate of 1,000 pounds and even more to the acre, and in Nebraska it is reported that Asparagus will yield 800 pounds to the acre. Cauliflower is reported as yielding less than 100 pounds. Lettuce averages less than 200 pounds. Onions range from 200 to 600 pounds. Rhubarb from forty to fifty pounds. The prices per pound at wholesale are averages from the reports sent in by the majority of the seed-growers in each state, and as most of the crop is delivered to contractors or dealers who supply the wholesale trade these prices are below the market rates, even in commercial centres, and yet there are striking variations in different localities. It is singular that the price of seeds in Massachusetts is much in excess of that paid to seed-farmers in other states, and averages at least twice as much as the prices in any of the states which border upon it. One reason assigned for this is, that one of the largest growers in that state is a dealer, and disposes of most of his stock directly to planters, and thus secures a somewhat higher price; and a second reason is, that many of the most successful gardeners of that state are afraid to risk their success on seeds of unknown origin and are, therefore, willing to pay higher prices to the neighboring seed-farmers who grow their choice seeds from selected stock.

It is stated that there is a feeling of depression among seed-growers. They made exceptionally large profits in the business up to the year 1883, and under the stimulus of these prices more seed-farms were established than have been able to find a profitable market since that date. The general feeling now is that there must be an advance of prices, or else methods of production must be improved, so that a greater yield can be secured at less cost of labor.

Pomology.

Meeting of the American Pomological Society.—II.

IN continuing the report of the meeting of the Pomological Society in Washington it ought to be said that the intermingling of discussions and essays on widely different phases of Pomology helped to sustain an interest in the sessions which did not flag until the final adjournment. Perhaps more time was devoted to the scientific aspects of Pomology than to what may be termed its practical and commercial aspects, but every day the programme had something to stimulate thought and arouse the attention not only of the men whose activities find exercise in the nursery or orchard, but also of the trained investigators in colleges and the experiment stations, who are studying more profound problems. The most entertaining discussion followed an address by Mr. Meehan on the "Influence of Heredity and Environment in the Origination of New Fruits." Mr. Meehan spoke without notes for half an hour very forcibly to prove the baselessness of the notion that any change in varieties could be produced by their surroundings, and he fortified his arguments with a wealth of illustrations drawn from human history as well as from plants and animals under domestication. Dr. Riley attacked the position of Mr. Meehan with great vigor, and Professor Bailey added that he was unwilling to allow it to be placed on record that the American Pomological Society held heterodox opinions on so capital a point, and cited numerous examples of variation in plants which he at-

tributed to their environment. Mr. Meehan replied with great good humor that his critics evidently did not understand what was meant by the term environment; and then Mr. Fernow added that if there was doubt as to the meaning of the term environment, there was also ambiguity in the use of the term variation, which might be structural or functional, and it was necessary to know whether we were talking about morphological variation or biological variation. The discussion became enveloped in a haze of uncertainty, as it appeared that none of the gentlemen were quite sure what the others were talking about, and it finally closed in a thick fog. It was very instructive and interesting, however, to the laymen.

Mr. J. M. Samuels, the Chief of the Horticultural Division of the Columbian Exposition, was an interested attendant on the meetings, and in the name of Director-General Davis he invited the society to hold their session of 1893 in Chicago. He also assured the society that the Director-General would appoint any man whom they should name as the head of the Division of Pomology.

We add below extracts from a few more of the important papers offered :

RECENT PROGRESS IN THE TREATMENT OF THE DISEASES OF POMACEOUS FRUITS.

Professor B. T. Galloway, of the Department of Agriculture, read a paper on this subject, which was substantially as follows :

The treatment of plant diseases is a subject of such recent origin that comparatively few are aware of the progress made in this line of work during the past few years. At the Boston meeting of this society, held only four years ago, it is doubtful if any one could have told how Pear-scab, Apple-scab, Cherry-leaf blight, or any of the numerous other diseases of pomaceous fruits, could be cheaply and effectually prevented. Nevertheless, the losses occasioned in this country by some of the maladies of pomaceous fruits have been enormous. Take, for example, the apple crop. At the very lowest estimate the damage to this one fruit in 1890 by scab alone exceeded six million dollars. The damage done to Pears, in both nursery and orchard, by leaf-blight, scab and cracking is probably as great as that of the Apple. Add to this the damage to Cherries, Plums, Peaches and similar fruits by such diseases as mildew, leaf-blight, rot and yellows, and the sum amounts to no less than fifty million of dollars annually. How to prevent this damage is a problem which has long confronted the fruit-grower, yet it was not until the year 1886 that the national Government, through its Department of Agriculture, established a branch for the investigation of plant diseases. This division, for so it is designated, has been constantly at work since its organization, endeavoring to throw light on the prevention of plant maladies.

The usual method of work is first to make a careful study of the diseases in the field and laboratory, and to follow this with practical field experiments, first on a small scale, and later more extensively if the results justify it. In accordance with a plan of this kind the work on Pear-leaf blight was commenced nearly three years ago, and is still being carried on. First it was necessary to study the life-history of the Fungus causing the disease, as it was only with a full and complete knowledge on this point that an intelligent effort in the way of treatment could be undertaken. As a result of the laboratory and field work along this line it was found that to successfully prevent the disease it would be necessary to protect the young unfolding leaves from infection by the spores or reproductive bodies of the Fungus which had passed the previous winter in the fallen foliage. As a mere statement this problem may not seem like a difficult one. The fact is, however, that a great many difficulties have been encountered, and while some have been overcome, others remain to be mastered.

The time of the first application, when the leaves are about half-grown, being settled, the next questions to solve were (1) the kind of preparation to use in order to cheaply and effectually protect and not injure the foliage; (2) the number of applications necessary, and (3) the cheapest and most practical means of making the applications. Without going into details it may be said that in treating nursery stock the best results have been obtained from six or seven applications of the Bordeaux mixture, applied with a Knapsack pump and improved Vermorel Spraying nozzle. The Bordeaux mixture is so well known that a description of its preparation is unnecessary, the standard preparation containing six pounds of copper and four pounds of lime to twenty-two gallons of water. While the best effects from this mixture have been obtained when Knapsack pumps were used, it does not always pay to use such machines for work on a large scale. Where one has 30,000, or even 50,000, stocks, two Knapsack pumps can do the work. For more than this, however, it is best to use horse-power machines. We have recently devised two machines of this kind: the first, a cart machine, holding twenty-five gallons, made to pump automatically, drawn by one horse and requiring two men and a boy to operate it. Four rows are sprayed at a time, so that it is not difficult to spray 100,000 or 150,000 Pear-seedlings a day with it. With a Knapsack pump 20,000 to 25,000 seedlings of this kind is a good day's work.

The second form of horse-power machine is simply a barrel mounted upon wheels or runners and provided with a force-pump which is worked by hand. With a horse, two men and a boy, four rows can also be sprayed at one time with this apparatus. The work cannot, however, be done as rapidly as with the automatic pump, although, owing to better control of the machine, it can be done more thoroughly. The cost of the automatic machine will range from forty dollars to fifty dollars, while the last-described apparatus complete can be fitted up at home for fifteen dollars. This includes wheels or runners, pump, suction and discharge hose, four nozzles and gearing for attaching the horse. A special feature of the machine we have devised is the pump, which is a modification of the one we use on our Knapsack Sprayer. Most of the force-pumps capable of supplying four nozzles are expensive, ranging in price from eight dollars to twenty dollars. The one under consideration can be made for two dollars and a half, and it is as durable and effective as any of the more expensive pumps. By attaching the pump to the automatic machine already mentioned the price of the same may be materially decreased. In fact, we are now perfecting an automatic apparatus that will spray four rows at a time, and which, we think, can be made for twenty-five dollars. The plan is to devise a machine so simple that the various parts may be obtained from most any reliable implement dealer and put together at home. All the machines mentioned can be used for various purposes, such as spraying Potato and Tomato-vines, Grapes, nursery stock and orchard trees.

Laying aside the question of machinery, let us turn again to the treatment of nursery stock and briefly summarize our present knowledge of this subject. We may say (1) that leaf-blight of the Pear, Plum, Cherry and Quince are best controlled by Bordeaux mixture, applied first when the leaves are one-third grown, and thereafter at intervals of twelve or fifteen days, until six or seven sprayings in all have been made; (2) that the ammoniacal solution of copper carbonate, applied the same as the Bordeaux mixture, is most successful in combating powdery mildew of the Apple. In the orchard, however, the ammoniacal solution has, for various reasons, been more satisfactory for Pear-leaf blight and scab than the Bordeaux mixture. It is also found that three or four early sprayings give as good results as six or seven made at intervals during the growing season. This statement may not hold good in the nursery where, as yet, no experiments have been made to test the matter.

The first extended experiments in treating Apple-scab were made in 1889 by Professor Goff, of Wisconsin, and Professor Taft, of Michigan, under the direction of the Division of Vegetable Pathology. It was then demonstrated that scab could be cheaply prevented by at least two of the copper preparations, namely, ammoniacal solution and modified Eau Celeste. The cost of the treatment averaged about twenty-five cents per tree, while the increase of perfect fruit on the treated trees over the untreated ranged from twenty-five to seventy-five per cent. In 1890 we continued the experiment, endeavoring to obtain information on a number of other points, chief of which was the value of early as compared with late treatments, the number of treatments necessary to obtain the best results, and the comparative efficacy of three fungicides, two containing copper and one devoid of this chemical. An attempt was also made to cheapen the treatment without decreasing their efficacy. It was found that early treatments, particularly those made just as the flowers were opening, were better than late ones. Three early sprayings—one when the flowers were just opening, one when the fruit was the size of peas, and one two or three weeks later—proved as effective as five, six or even seven sprayings made at intervals during the summer. The best fungicide was one originating with us last year, and sent out under the name of Mixture No. 5. It consists of equal parts of ammoniated copper sulphate and ammonium carbonate. It was used at the rate of from eight to twelve ounces

to twenty-five gallons of water. The special advantages of the mixture are (1) cheapness; (2) ease of preparation and application, and (3) that it can be put up in dry form in small or large packages, making it easy and convenient to handle by the practical man in the field and the store-keeper who may wish to place it on the market. The chief objection to it is that it sometimes burns the foliage. While this drawback may in time be overcome, it is necessary that we know of it, in order that due care may be observed in using the solution. Work on the treatment of this disease is being carried on this year by us in the chief Apple-growing sections of the country. As yet it is too early to speak definitely of results, but enough is known to warrant us in saying that many new points will be brought out. The conclusion of the matter is, that, with even moderate care, Apple-scab can be largely prevented in the most badly affected regions at an expense ranging from ten to twenty cents per tree.

FRUIT DISTRICTS GEOLOGICALLY AND CLIMATICALLY CONSIDERED.

Professor E. S. Goff read a carefully prepared paper on this subject. After giving many illustrations of the fact that certain regions, often of very limited area, are specially adapted to certain fruits, the author gave a brief general description of the irregular zones in which tropical and more hardy fruits are found at their best, and continued as follows:

It is a fact of importance to horticulture that, other things being equal, the further north a fruit district is located, the more profitable is the culture of the fruits to which it is adapted. Competition from the same latitude is not only restricted, but the cost of transported fruits is great. In more delicate fruits, as the raspberry, blackberry and strawberry, the lateness of maturing in northern fruit districts shuts out southern competition. In the case of some other fruits, as the apple, the longer days of the more northern clime develops a brilliancy of color that is not found in regions further south. In Wisconsin, successful apple culture is limited to a comparatively few districts, and these are mostly of small extent, yet the profits realized from the few successful orchards surpass those from the finest orchards of western New York. These facts give an added interest to these northern fruit-regions, and invite a study of the causes which serve to locate and circumscribe them.

Within a few years the eastern shores of Lake Michigan, particularly in the portion south of Grand Haven, have become famous for peaches. On the western shore of the same lake the Peach rarely yields fruit, while a few miles further to the westward only the more hardy varieties of the Apple can be successfully fruited. On the east shore of the lake, however, Apples, and even Peaches, are said to succeed as far north as Mackinaw, which is a degree north of the northern boundary of New York and Vermont. The causes for these differences of climate in a similar latitude, according to Professor Winchell, "must be attributed to the fact that the prevailing winds which bring frost or severe cold are westerly, reaching the easterly, or Michigan, shore only after having traversed nearly or quite one hundred miles of deep open water, to which, during the warm season, they will have surrendered a very considerable increment of heat, to be retained until it shall be wrestled for and re-absorbed by the colder gales of late autumn and winter, thus quenching their excess of cold by the transfer to them of a portion of the surplus heat of the warm season. . . . It is also a fact that a current sets northward along the easterly shore of Lake Michigan, doubtless occasioned by the increased influence of prevalent south-westerly winds upon the waters nearest that shore; and there is a reverse current along the westerly shore, thus causing a slow but constant transfer of the warm waters of the south toward the northern extremity of the lake, and vice versa, much in the same manner as the tepid waters of the Gulf of Mexico are transmitted by the Gulf Stream to soften the climate of north-western Europe."

In like manner the southern and eastern shores of Lake Erie and the eastern shore of Lake Champlain present a somewhat softened climate as compared with localities more remote from water, making the former district well adapted to the culture of native Grapes, and the latter to that of hardy Apples. Even the smaller lakes of central New York, aided, doubtless, by the larger Lake Ontario to the north, are surrounded by fruit-districts in which varieties of the Grape and Peach succeed that cannot be grown in northern Pennsylvania. Especially is this true of Keuka Lake, on the banks of which frosts hold off until the middle of October, and the Catawba grape ripens to perfection in the average season. The influence of physical features in modifying climate is strikingly shown in California. Here the combined influence of the great Pacific Ocean, with its Japan current washing the coast with waters tempered by a tropical sun, and the mountain barriers to the eastward, deflecting the northerly winds, actually cause the isothermal lines, which normally run east and west, to extend north and south. Indeed, in some cases, fruits ripen earlier in the northern than in the southern parts of the state.

At certain altitudes in the mountain districts of California and elsewhere occur belts of greater or less extent that are singularly free from spring and autumn frosts. These locations have been called "thermal belts," and are peculiarly adapted to fruit-culture. Their altitude secures free circulation of air and immunity from violent summer heats, which make them less subject to many fungous diseases than the valleys beneath, while their almost complete freedom from frost gives them a prolonged growing season. In seasons when premature warm weather in spring is followed by severe frosts, these thermal belts are sometimes conspicuous along the mountain-sides from the lively green of their newly formed foliage, while both above and below the premature growth has been blasted by frost. The presence of these belts has been explained by the merging of the ascending current of warm air from the valleys beneath, with the more rarefied atmosphere of the mountains. The warm currents ascend until they reach strata of equal rarefication with themselves, where they cease and merge themselves into the existing atmosphere.

It would seem that the great mountain regions of our western states and territories must abound in these thermal belts, and though comparatively few of them have as yet been developed for fruit-culture, it is not impossible that the golden fruits and rich vintages of this vast mountain system may yet rival in value the outputs of their quartz mills and placers.

Certain fruits are especially susceptible to certain features of environment. The Cranberry, it is said, cannot endure a soil that contains any considerable admixture of clay or lime. The European wine Grape (*Vitis vinifera*) is very susceptible to extremes of atmospheric humidity; the fruit-buds of the Peach are very susceptible to the cold of winter. The area of successful culture for such fruits is greatly restricted as compared with what it might be but for these special weaknesses.

I may add, in conclusion, that the subject of plant adaptation should receive much more study than has yet been devoted to it. It would seem that a thorough study of plant environment in our distinctive fruit regions should enable us to establish a formula by which the adaptability of any given locality for any particular fruit might be determined without resorting to the costly method of experiment. What expense and disappointment might have been saved could it have been determined beforehand that the European Grape could not succeed in the eastern United States! De Candolle, who has given much study to the geography of plants, was unable to explain their failure from any data that he could procure. Could he have had access to more complete meteorological facts, it is probable that he might have assigned the true cause. This, indeed, is the crying need. I have made some attempt at these studies, but have been disappointed at the meagreness of the available data. It is true that the reports of the signal service have very great value, but before the science of plant adaptation can be fully developed we must have series of observations reaching through years, not only of temperature, humidity, precipitation, cloudiness and wind, but of the intensity of sunshine, of soil temperatures and moistures, of the prevalence of fogs and dews; and we must have these observations not simply from one or two localities in a state, but from every locality that has a specially interesting economic flora. Those who are patiently making laborious observations at our signal service and experiment stations, and who often wonder if their patient labor will ever be appreciated, should take new courage. It is from data of this kind that a new science is to be developed that will prove of vast importance to a future generation.

FRUIT NOTES FROM CANADA.

Mr. L. Woolverton, of Grimsby, Ontario, reported some experience with different fruits in Canada, from which we make the following extracts:

Some standard Apples which were once counted as most valuable from a commercial point of view are now condemned entirely by many of our leading growers. One of these is the Baldwin, which, for the past few years, has been almost barren. The Early Harvest and Fall Pippin, which were considered our principal summer and fall varieties, are now no longer of value, owing to the apple-scab. Even the Northern Spy and Greening have of late been badly affected with this pest. We feel exceedingly grateful to the Department of Agriculture of the United States for the remedies

which have been proposed for this and other fungi, and we are prepared to test them fully and report to you the results. During this last season I have sprayed faithfully with carbonate of copper, as recommended by your department, but there has been scarcely an appearance of the apple-scab in our orchard, whether sprayed or unsprayed, and, consequently, we are unable, as yet, to judge of its effectiveness.

Concerning Russian apples, we are scarcely willing to condemn them wholesale, for we are finding among them some which we think will be suitable to the cold north; for instance, the Golden White, which has been tested in the province of Quebec, is exceedingly promising. Among native varieties, we think highly of the Wealthy, which has been tested faithfully in the county of Renfrew, and some of the members of our association looked upon it as the very best variety that has ever been tried in that section. Samples were sent to me last fall from there, and also some from farther south, but those grown at the north were far superior, both in size and color. Of Canadian seedling-apples of promise the Princess Louise and the La Rue are worthy of notice. Renaud's Seedling is a winter apple which appears to be very promising. It is a chance seedling, found growing on the farm of Mrs. Renaud, at Grenville, forty-five and a half degrees north latitude; should it prove equal to its promise in size, beauty, productiveness and hardiness, it will be a great boon to that section of country.

Notes.

Several of the Ginkgo-trees in Central Park are bearing fruit this year, and one of the trees in the avenue which leads up to the Department of Agriculture in Washington is literally loaded with fruit which, hanging at the end of the long stems, adds much to the beauty of the tree.

In New England, about 1635, Woods says: "The ground affords very good Kitchen Gardens, for Turnips, Parsnips, Carrots, Radishes, and Pumpions, Muskmillions, Isquontersquashes, Cowcombers, Onyons, and whatsoever growes well in England, growes as well there, many things being better and larger."

At the late meeting of the Pomological Society in Washington, in speaking of Currants, Mr. John Saul stated that he had yet to find the equal of the true Red Dutch, which is not only the most productive variety he knows, but makes the richest jam and jelly. He, however, accepted the suggestion made by Mr. T. T. Lyon that the true White Dutch Currant was quite as good.

A good late-flowering shrub for latitudes south of New York is *Clerodendron trichotomum*, which is still blooming well in Philadelphia and Washington. It will live as far north as Massachusetts, but is usually injured by the winter, so that it does not flower freely. In sheltered places it will do well about New York. It becomes a large spreading shrub when well grown, and the branching cymes of white flowers in red calyces, held well above the foliage, make an interesting picture at this season.

A schedule of prizes for the Chrysanthemum show which is to be held under the auspices of the New York Florists' Club at Madison Square Garden, in this city, from November 2d to the 8th inclusive, has been published. Six thousand five hundred dollars are offered in premiums, besides prizes for Orchids, Roses, Carnations and miscellaneous plants. Special attractions are advertised for each day of the exhibition. The Garden offers 30,000 square feet of floor surface, and the display ought to be one of exceptional interest.

An interesting feature of the *Transactions of the Indiana Horticultural Society* for last year, which has just come to hand, is a catalogue of the birds found in that state. This catalogue is illustrated with cuts from Coues' "Key to North American Birds," and it will enable the young people of Indiana to identify any of the species which come under their notice, and no doubt will encourage among them the delightful study of ornithology. The last session of the Legislature of Indiana passed an act to protect birds, their nests and their eggs. The indiscriminate slaughter of our wild birds has much to do with the increase of injurious insects, and farmers and gardeners in all parts of the country are interested in protecting these true friends of man.

Schubertia grandiflora is proving itself very useful as a summer climber. A plant two or three inches high set out last May should now be twenty feet high. We recently saw a plant trained to a fence only six feet high, and it has now spread out so as to cover fifty square feet, and its score of trusses of glittering white flowers against the dark green of the foliage makes a striking picture. The flowers, when open, are more than two inches across. They are of a thick waxen texture, and are as glossy as if they had been varnished. The individual flowers remain open a long time, and very often all of the flowers on a truss, some five or more, are open at once. It is said that the plant will survive the winters in southern California. If this is true, a well-established plant there would be very effective.

It is well known that the foreign varieties of Gooseberry are rarely cultivated with any success in this country, although there are skilled growers here and there, like Mr. Benjamin G. Smith, of Cambridge, Massachusetts, who succeed with this fruit. The great difficulty has been that the plants mildew badly. Many preparations have been used to combat this disease, but, perhaps, the most promising is the one which has been applied at the New York Experiment Station, in Geneva, successfully for the past three years. The fungicide used there is potassium sulphide, or liver of sulphur, half an ounce of which is used to one gallon of water. The sulphide dissolves readily in hot water, and as it costs only fifteen or twenty cents a pound, and a gallon of the mixture is sufficient to spray ten or twelve large bushes, it will be seen that the expense is trifling. If the spraying is done with a syringe the amount will need to be increased. At Geneva, this year, the foreign varieties have been kept entirely free from mildew, and the plants were loaded with clean bright fruit, each plant yielding over ten pounds of berries. The practice at the station is to commence spraying as soon as the young leaves begin to unfold, and to continue at intervals of from eighteen to twenty days, except in case of heavy rains, when it would be necessary to spray the plants more frequently.

For three years past the chemists of the Kansas Experiment Station have been endeavoring to improve Sorghum as a sugar-plant, by seed-selection. Their plan has been to select the seed from stalks which show an exceptionally high sugar content, although other good points, such as size of stalk, amount of glucose and yield of juice, have not been neglected. The variety known as the Orange and Amber Cross gave 12.7 per cent. of cane sugar in 1888; 14.8 per cent. in 1889; 14.6 per cent. in 1890, and 16.5 per cent. in 1891. The best stalks in these years contained 14.2, 17.5, 16 and 18.2 per cent., respectively. These figures indicate gradual advancement, and so does the sugar from seed of three stalks planted separately. The product from the seed of last year's richest stalk is the richest this year. As Professor Failyer suggests, it would be rash to do more than point to the indications of these results. Other causes than seed-selection may have helped in securing them. The apparent improvement may prove to be apparent only, and another season may see the quality revert to its former stage. The improvement of four per cent. in three years is probably too great to be permanent. But if Sorghum can be grown with a juice containing an average of even fifteen per cent. of crystallizable sugar of an average purity of eighty, the profits of sugar factories are assured. At all events, it is worth while to continue the experiment of seed-selection for some years at least.

It is stated in *Science* that, sixteen years ago, Professor Rein, the well-known authority on Japanese art and industry, planted in the Botanical Garden at Frankfort some specimens of the Lacquer-tree (*Rhus vernicefera*), from which the Japanese obtain the juice employed in the production of their famous lacquer-work. According to the *Times*, there are now at Frankfort thirty-four healthy specimens of the Lacquer-tree, thirty feet high and two feet in girth a yard from the ground; and the young trees, which have sprung from the original tree's seed, are in a flourishing condition. It seems to be proved, therefore, that the Lacquer-tree is capable of being cultivated in Europe, and it only remains to be seen whether the juice is affected by the changed conditions. The *Times* says that, to ascertain this, Professor Rein has tapped the Frankfort trees, and has sent some of the juice to Japan, where it will be used by Japanese artists in lacquer-work, who will report on its fitness for lacquering. In the mean time, some of the most eminent German chemists are analyzing samples of the juice taken from the trees at Frankfort, and samples of the juice sent from Japan; and should their reports and the reports from Japan be favorable, it is probable that the tree will be largely planted in public parks and other places in Germany. In course of time a skilled worker in lacquer would be brought over from Japan to teach a selected number of workmen the art of lacquering wood, and in this way it is hoped that a new art and craft may be introduced into Europe. Professor Rein has been conferring with the authorities at Kew as to the results of his experiment.

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Report of the New York Forest Commission.

THE fifth annual report of the Forest Commission of the State of New York contains much interesting information, and is full of encouragement for the future in the indication it gives of increased intelligence and a greater interest in the forests of the state than prevailed in this community at the time when the present Commission came into existence. When it is remembered how feebly the public pulse beat ten years ago for the safety of the North Woods, and how great the opposition from the inhabitants of the northern counties was to every serious attempt made for their care and protection, the present feeling of the community must be a source of gratification to the men, very few in number then, who believed that there was no better piece of work to be done than to save this wild region for the benefit for all time of the people of New York. Something certainly has been accomplished; not very much, perhaps, when one remembers the great gashes which have been made in the wilderness during these last years, but a step forward has been taken, and the fact that the Commission is able to report that, through the rules and regulations it has made and enforced, fires, always the greatest menace to the forests of this country, where climatic conditions and forest-composition specially favor their spread, have decreased to a very marked degree. Even more encouraging than the diminution of fires in the Adirondack woods is the smaller number of willful trespassers on the state lands. People are learning at last to respect the forest as property which cannot be entered and despoiled with impunity, and the purchasers of forest-supplies in New York have gradually outgrown that peculiar moral attitude which enabled them to acquire, without any great strain on their consciences, lumber, bark or cord-wood of very uncertain origin. That the Commission, backed by increased public intelligence on the forest-question, has been able to accomplish what it has done already with only a very moderate outlay of money, is certainly hopeful, and seems to indicate that while we are still very far from attaining to the system and perfect methods under which European forest-property is usually managed we are as a people in a better mental condition than we were ten years ago to submit to the restrictions which forest-control must always impose on all inhabitants of forest-regions.

The most important part of the Commissioners' report relates to the proposed Adirondack Park, the possibilities of which they have been studying, their conclusions on the subject, here reproduced, having already been presented to the Assembly in a special report. The proposal of the Commission, stated simply, is that a forest-park shall be created in northern New York to consist of some 2,200,000 acres, to be surrounded by a line not yet actually determined on, but so drawn as to enclose the principal sanitariums and the wildest and most picturesque parts of the region. A portion of the proposed park the state owns already, generally in small and often in widely separated parcels; and a very considerable portion belongs to hunting and fishing clubs, which of late years have been buying up large tracts of the wilderness. Other parts belong to hotels and sanitariums, and the remainder, and probably the largest part, to individuals or firms, who hold the land for the value of timber growing on it. The community is fully alive to the necessity of the state's securing such a park or reservation or public forest, to use what is perhaps the most appropriate name for it, and the public is now so generally in accord with the views of the Commission as to the necessity of such a reservation that it is needless to discuss, at this time at least, the merits of the measure. But the Commission finds itself when the question of methods is reached in serious difficulties. It feels that if it recommends that the state exercise its right of eminent domain and take possession of all the land within the boundaries of the proposed park, the plan would create so much opposition from interested parties that the whole scheme would be defeated; on the other hand, the state is unable to purchase the land at anything like a fair price, as much of it is held by persons who do not want to sell at all, or by men who have bought their holdings in the hope of selling it, at some time or other, to the state at a greatly increased price. The land now held by the state has been principally acquired at tax-sales, but all Adirondack lands have now become so valuable that the time has certainly passed when the state will be able to add to its holdings in this manner.

The Commission has hit upon a compromise measure by which it is hoped that the forest-reservation can be secured through arrangements made with the individual owners, under which these will agree to manage their land in such a way that the community will obtain substantially the same advantages that it would if the title to all the lands rested in the state itself. The plan seems to us to be a bad one. A great state forest, such as is needed to accomplish what is expected of the Adirondack forest, cannot be established on a really stable and permanent basis until the state itself holds the fee to every foot of land within its boundaries. What security can private owners give that they will preserve the natural conditions of the forest beyond the time when it would be for their individual interest to destroy these conditions? What is to prevent the sporting clubs from selling their land by and by to men who will buy it simply for what they can make out of it? What restrictions can be put by the state on the cutting of timber from land belonging to individuals which can be enforced for all time? Can railroads be excluded from land belonging to individuals if it is for their interest to have them built that their timber can be sent to market? The whole question is not a very different one, except in its magnitude, from that presented in the establishment of a city park. What, for example, would have been the probable consequences if some of the owners of the land which is occupied by the Central Park, in this city, had been allowed to retain the fee to their land? What sort of a park would it

have been if men, without reference to the needs or the good of the public, had been able to build a hotel or a trotting-track or a block of stores in the midst of it?

No; there is but one way to proceed if the state of New York needs a great forest-park to preserve the flow of its rivers and to afford its people for all time the opportunity to enjoy the beauties and advantages which a communion with nature always brings to the human race, and that is to take the land. It is not easy to imagine a case where the right of eminent domain could be more wisely enforced, or where the individual suffering would be smaller in comparison with the benefits bestowed upon the public at large by the taking. Bricks cannot be made without straw. A public forest in this state, covering 2,000,000 acres, and 3,000,000 would be much better, would involve a large immediate outlay, perhaps twenty millions of dollars, probably more rather than less. It might have been had ten years ago for half the money; in ten years from now it will cost twice as much, and the necessity of the reservation will be incomparably greater. But even a larger sum than twenty millions of dollars will be well invested in securing such a reservation which can be made to pay at once a fair return for the investment. A large part of the land, once the fee is secured, can be leased to the clubs and to the lumbermen on long leases, with proper restrictions as to the cutting of timber. The hotel sites and the sanitariums can be leased to the original owners if they care to continue in the business. These rentals and the sale of timber—for any sensible management of the woods means the cutting of all ripe trees under some well-considered system—the fishing and hunting rights and other sources of income would, almost from the very beginning, pay the interest on the cost of the investment, and in the future, as forest-property becomes more valuable, the operation should show a handsome profit.

Money expended on a state reservation which the state does not control is money thrown away, for it will not accomplish any good results, but the money spent in acquiring a fee to the land is money well spent, as it will bring health and prosperity to the whole state. There will be serious opposition to such a scheme on the part of many interested men, but the people in the end would favor it; and there can be no doubt that in time the measure can be successfully carried out if it is advocated intelligently and persistently.

New England Parks.

THE LYNN WOODS.

THE distinctive character of this stately park of sixteen hundred broad acres is well indicated by its name. Here are no smooth lawn expanses, no manufactured terraces, no artfully artless shrubberies, no mall, no playgrounds of skillful fashioning, but, in their stead, gigantic boulders, deep ravines, and rocky summits, and everywhere the unending forest, where one can dream of Sherwood and the merry outlaw Robin Hood. One is half-tempted to wind a bugle in these wilds to see if the men in Lincoln green might not come dashing through the bracken at the call, and behind the boles of the great trees one fancies he may catch a glimpse of Little John, or the burly figure of Friar Tuck.

From the founding of the settlement in 1629 these woods of Lynn were held as commons by its farmers, but only of late years, thanks to the public spirit of some of her citizens, has the property been legally acquired by the town, to be held perpetually as a pleasure-ground for its people.

When the plucky race that dared to settle Massachusetts first took possession of this part of the country, they found a strip of level fertile land, lying near the sea, which received the wash of a line of wooded stony hills, a part of the picturesque low range that extends along the shore, from Cape Ann to the well-defined summits of the Blue Hills of Milton. Here were good arable fields, and they accordingly selected it for their homesteads, reserving the heights behind as a common pasture for their animals.

These commons the farmers divided by long walls, built by their combined labor, and they still retain their ancient names. The Cow-pasture was the part nearest the town, that the milky mothers of the herd might easily be reached for domestic purposes. The more remote and hilly section was the Horse-pasture, where the mares and colts, and horses not in use, could pick up an inexpensive living; and a third division, across the swamp which drained the hills, bears to this day the title of Ox-pasture.

This whole region, now, all but the last, included in the park, is thickly wooded with good-sized trees, mostly Oaks, Maples and Walnuts, interspersed with some Pines and Hemlocks of great size. Black Birches and Ash-trees are also found, and here and there some Beeches. The wide marshes that separated Ox-pasture from the others have been transformed into a chain of lakes, two miles in extent, along and across which the parkways wind, while the water, now limpid and sweet, serves to supply the growing city.

The margins of these roads by the water-side, unnecessarily stripped by the engineers of the water-works of all their trees and shrubs on one side, are struggling to renew their growth, and if the Park Commissioners will put in a few Willows here and there for quick effect, bountiful nature will in a few years repair the ravages of man, and restore the lovely green screen between the road and the water, which is very essential to the beauty of the drive. Picturesque glens border this parkway, on the uncut side, with a charming undergrowth of shrubs and ferns, and fine tall trees climbing the stony heights.

Under the guidance of an enthusiastic lover of the forest, who has done much for the park, we wandered through the woods along a cart-path, outlined in soft green ferns close set as turf, until in the heart of the woods we came upon a curious reminiscence of the old settlers, the wolf-pits—two grave-like excavations, lined with stone like a well, some six feet in length by three feet wide, and originally more than nine feet deep. These holes, covered carefully with brush and sprinkled with bait, attracted the unwary wolf, who could be easily destroyed by the trapper. Tradition tells of one of the forefathers coming upon an unexpected find when he drew his traps of a morning, for there, in one corner of the deep pit, sat a cowering squaw, glared at by a terrified wolf at the opposite end, each too alarmed to approach the other.

Within the park itself are curious formations of stone; great rocks with caverns beneath them, one of which is known as Dungeon Rock. The name implies a tradition, but none has survived to fit it with a legend. The nearest approach to one is the story of the spiritualists, who here held their meetings and performed uncanny rights, excavating the rocks under the direction of their familiars, and producing strange relics which were supposed to be found beneath them. Here they built odd circular dwellings of stone, miniature towers, that will, when overgrown with Ivy, prove effective as ruins. One of their leading prophets is buried here, at the foot of the rocks, in a grave surrounded with a pointed battlement of stones, and on the leaf-strewn earth within lay some fresh flowers, showing the recent visit of some disciple to this lonely spot.

Another picturesque feature of the woods is the ravines hung with ferns and bushes, one of which is over two hundred feet in depth; but what pleased me best of all were the four rocky hill-tops rising so high above the trees that the view over the surrounding country is unobstructed. From one of these the beholder receives an extraordinary impression of the extent of the woods which surround him.

This park is the largest in the country except Fairmount Park, Philadelphia, but even the knowledge of its numerous acres does not prepare one for the effect of unbroken forest he receives when he climbs this summit and looks off upon the landscape bounded by the sea and the far-distant mountains of New Hampshire. Ten miles away the glittering dome of Boston catches the eye above its misty group of spires and chimneys, and on the other side Marblehead Light can be viewed, out on its rocky point in the north, Chicorua and Monadnock raise their giant heads above the low-lying clouds, and hill upon hill bounds the horizon, but Lynn has disappeared. Trackless woods seem to encircle the spot. No houses or spires are visible near at hand. What seem to be miles of trees lie below in varying shades of green, over soft undulations which tell of alternations of hill and dale, ravine and boulder, but all that speaks of the busy town somewhere near by has melted into the wilderness. Between Mount Gilead and Shawmut are seen only the tree-tops and the gray line of water where the coast curves.

Such a sight, lacking the dome and spires, may have met the eye of the early settler when he first climbed his way through the forest to this bald hill-top. A far-away sympathy with that lonely pioneer seizes you as you gaze. How desolate, how unconquerable must have seemed that waste of woodland, even to his dauntless spirit, strong to combat with virgin

nature. To-day, again, one feels the power of the encroaching forest; of the littleness of man against the eternal forces. Let him pause an instant and he is swept from the face of the earth; his proudest home a ruin, over which the wild vine clambers; his once stirring town a prey to the readvancing wilderness. Such sights, I am told, are to be seen in the far west, where the embryo town, deserted, relapses into desolation. A strange fear came upon me as I looked. We who preserve forests do we not cherish a foe in this great blessing? The lonely terror of the great woods came upon me, and in thought I saw this busy region once more a waste; all this bustling, nervous life stilled; our civilization an overgrown wreck; an Oak-forest where the State-house stands; a group of Pines on Marblehead Neck.

Climbing another of these hills I was reassured. There sat Lynn upon the shore as large as life, with the chimneys of its manufactories belching smoke, its railroads teeming with traffic, its harbor white with sails. Other towns came into view from other elevations—Peabody and Salem, only three miles distant from the park's eastern gate; distant Danvers among its Elms, and Wakefield, Malden, Everett and Chelsea, all within easy driving distance, on the west, while electric cars, packed with people, were bringing throngs for rest and solace to the wild solitudes of the great woods.

Then came to me a new sense of pride in our people, who in the midst of their struggle for a living, with all their greed of gain thick upon them, find time to think of their children and to plan an everlasting pleasure for the future citizens. This friendliness of spirit is more fine even than the forest which it cherishes, and one honors the men who conceive this idea and labor to confer this boon upon their neighborhood.

The moving spirit in acquiring this park for Lynn was Mr. C. M. Tracy, whose zeal and example induced many citizens to join in purchasing the land which was a nucleus for future acquisitions. Later, like all great enterprises, it outgrew its founders, and the town itself had to come in with its right of eminent domain, and add more and more to the reservation. Lovers of nature and the people, like Mr. P. A. Chase, have bought other forest-lands to protect it and ultimately increase the noble dimensions of the park, and so the good work goes on.

A fine grove of noble Hemlocks was rescued from the very axe of the headsman by Mr. Chase, and forms one of the most beautiful ornaments of the park, the trees being of great size, with a stony brook flowing between the hills on which they grow. Cardinal-flowers bloom, and great Ferns wave beside this murmuring stream, and the sunlight sifts in among the branches, and makes of it an enchanted grove, from which there is an outlook upon one of the four ponds that add so much to the charm of this region of rock and woodland.

I have not spoken of the beauty of the drives, which, following the lines of the old cart-paths, wind in graceful curves all through the forest, nor of the wild paths that lead by short cuts to Dungeon Rock and to the look-outs from the hill-tops, as well as to interesting vistas and places of interest. It was a pleasant sight to see car-loads of people hurrying to the woods for change of scene, and to hear the echo of glad children's voices and to see the look of enjoyment in the tired faces of pale mothers who had escaped hither from the town.

The scheme of the park includes places of recreation for young and old. The drained marsh in winter will be excellent for skating. There are to be ball-grounds and tennis-courts, and conveniencies for picnics, rough tables and seats being already provided for the last in an appropriate place. It is the People's Palace, where they can take continual delight, and to which not only the inhabitants of Lynn can resort, but those of seven neighboring towns, none of which are more than three miles from its various entrance-gates. This great domain is the magnificent gift of a generous people to the Commonwealth, and well may the citizens of Lynn take pride in so princely a possession.

Our "great, avaricious, sensual America," that Emerson talks of, has a warm heart beating in her young breast, and a generous hand to give. Never is the cry of the needy unheard by her, and to her children she gives royally and wisely.

This noble public spirit in our people, this large-hearted, open-handed bestowing, is a splendid sign for the future. If these things are done in the green tree, what shall be done in the dry? If now, in the hot impatience of hungry youth, our citizens still plan for the future of their neighborhoods, how much the more, as the country matures, will these gifts increase, as, fired by the great examples of their ancestors, the future sons of the Republic lay the foundations of long-enduring benefactions, none, however, to be more precious to the people than the great and beautiful woods of Lynn.

Hingham, Mass. *M. C. Robbins.*

Filices Mexicanæ.—II.

WE now continue the enumeration of the Ferns collected during the seasons of 1888, 1889 and 1890, by Mr. C. G. Pringle, of Charlotte, Vermont, in the states of Nuevo Leon, Jalisco, San Louis Potosí and Machoacan, Mexico. We are indebted to Mr. George E. Davenport, of Medford, Massachusetts, for the list, together with notes and descriptions of new species and varieties. The numbers used correspond with those on Mr. Pringle's tickets which accompany his distribution.

Asplenium pumilum, Swz. (2583). Shaded damp banks of Barranca, September, 1889; also 2028, same locality, December, 1888. This is undoubtedly true *pumilum*, and very distinct from Pringle's 1444 of his 1887 collection, which was referred to this species with some hesitation in "Fern Notes," X., in *Bulletin of the Torrey Botanical Club*, vol. xv., p. 226, and which will now have to be otherwise disposed of. Professor Eaton suggests that it may be a very dwarf form of *A. Mexicanum*, Mart. & Gal., now *A. fragrans*, or a possible hybrid between that species and *A. pumilum*. But whether those species grew in the same locality, or near by, where it was collected, or not, I do not know, as my own specimens of all three Ferns were collected in different localities far apart. It is, however, unlike any form of *A. fragrans* that I have seen, and, as it is left in so unsatisfactory a condition of determination, I venture, as a possible solution, to give to it the provisional name of *A. dubiosum*, in recognition of its present uncertain character, and submit the following brief diagnosis:

Asplenium dubiosum (1444). Collection of 1887, *n. sp.* Stipites tufted, 1′ to 2′ long, brown, naked; laminæ 1′ to 2′ long, ¾′ to 1¼′ broad at base, varying from oblong-lanceolate to deltoid-ovate or triangular, pinnately divided into from two to four pairs of wedge-shaped ovate or obliquely ovate pinnæ, lower ones the largest; upper portion sinuately pinnatifid, with obliquely obovate or cuneate dentate divisions, to the apex; lowermost pinnæ deeply cleft into one or two pairs of obliquely obovate or wedge-shaped toothed divisions at the base, and sharply dentate to the apices; texture coriaceous; main rachis green, channeled along the face and extending downward on to the stipes; sori oblique, becoming confluent when mature.

Habitat: Ledges, Arroyo, Aucho, Sierra Madre, state of Chihuahua, October 15th, 1887. Resembles *A. pumilum* in the shape of its fronds, but with the evergreen texture of *A. montanum*, and more sharply toothed divisions.

Asplenium Shepherdi, Spreng. (2025). Under wet cliffs near Guadalajara, December, 1888. A form which appears to me to be var. *inequilaterum*, Baker.

Asplenium Trichomanes, L., var. *repens*, Davenport (1838). Moist banks near Guadalajara, November, 1888.

Botrychium Virginianum, Swartz (3408). Wooded hills of Patzcuaro, October, 1890.

Blechnum occidentale, L. (1870). Springy banks near Guadalajara, November, 1888.

Cheilanthes Cooperæ, D. C. Eaton (1863). Shady mossy ledges or rocky banks, in damp places, chiefly in the Barranca and its branch cañons, November, 1888.

Cheilanthes gracillima, D. C. Eaton (2037). Dry ledges of Sierra Madre. Altitude 8,500 feet, October, 1888.

Cheilanthes lendigera, Swartz (3368). Dry ledges, hills of Patzcuaro, November, 1890. Specimens large and beautiful.

Cheilanthes meifolia, D. C. Eaton (1987). Northern slope of the Sierra Madre, near Monterey, abundant on cool, shady, often rocky, steep banks of gulches and ravines, June, 1888.

Cheilanthes microphylla, Swartz (1988). With broadly deltoid or triangular-ovate fronds, from limestone gulches and shady banks of mountains east of Monterey; and (1989) with tall and narrow fronds from partially shaded banks of dry gulches in cool, shady cañons, foot-hills of the Monterey, Sierra Madre, June, 1888; also 2024, from near Guadalajara, December, 1888, a very pubescent form, with broadly oblong fronds. The three forms are distinct enough in appearance for different species, but I can find no good characters by which to separate them even as varieties.

Cheilanthes Palmeri, D. C. Eaton (2584). Shaded ledges, near Guadalajara, September, 1889.

Cheilanthes tomentosa, Link (2603). Near Guadalajara, 1889, a rather lax form, with but slight pubescence.

Cheilanthes viscosa, Link (1842). Moist banks, near Guadalajara, November, 1888, large and fine.

Dicksonia rubiginosa, Kaulf (3407). Rich ravines, Tamasopo Cañon, June, 1890.

Gymnogramme pedata, Kaulf (1861). Damp shady banks, near Guadalajara, November, 1888; common in the Barranca and trenches.

Gymnogramme pilosa, Mart. & Gall. (2589). Wet rocks, near Guadalajara, November, 1889.

Gymnogramme tartarea, Desr. (1862). About the wet bases of sand-walls in gullies near brooks and springs, 1888.

Hemionitis elegans, *n. sp.* (2585). Root-stock, short, stout, ascending, crowns clothed with coarse pale brown scales; fronds 6′ to 16′ tall; stipites 3′ to 7½′ long, dark chestnut brown, polished, deciduously scaly at the base, naked above; laminæ 5′ to 9′ long, 4′ to 10′ broad, broadly deltoid-ovate, sinuously lobed at the base and palmately cleft into from 3, in the smaller, sterile, to 5, in the larger, fertile fronds, long acuminate divisions, the lower pair spreading and somewhat auricled at the base; texture, herbaceous; color, dark green; fructification confined to and following the course of the beautifully reticulated venation over the entire under-surface. Whole plant smooth.

Habitat: Shaded banks and ledges of the Barranca, near Guadalajara, September 24th, 1889. A very striking and handsome Fern, which takes its place at once as the most imposing member of a small genus which is confined almost exclusively to the tropics. It bears some resemblance to the next, but is from two to three times as large, and Mr. Pringle is to be congratulated on having made so fine a discovery. The figure opposite is from a drawing by Mr. C. E. Faxon.

Hemionitis palmata (3410). Tropical forests, Tamasopo, June, 1890.

New or Little-known Plants.

Habenaria carnea.

Some account of this recent introduction from Singapore was given in our London letter last week, where it was stated that the plant had just flowered at Kew. The illustration on page 487 is from a photograph of this plant. In habit the plant resembles *Habenaria militaris*, but instead of being a bright scarlet like an English soldier's jacket, the flower is a delicate flesh-pink, which fades later on to almost white. The stem rises to a height of six inches and bears some half a dozen flowers which have a spreading lip, a spur often three inches long, and ovate petals and sepals. The leaves are deciduous, and after they fall the plant rests in winter and pushes into growth again in spring. A compost of peat, sphagnum and leaf-mould seems to suit the plant, and it needs abundant heat and moisture. The flowers last nearly a month, and the plant will commend itself to all who are interested in the smaller terrestrial Orchids.

New Orchids.

Physosiphon Guatemalensis, Rolfe, is a small species which appeared with *Odontoglossum grande* in the Glasnevin Botanic Garden, where it flowered in June, 1890, and again during the present year. It is nearly allied to *P. Loddigesii*, Lindl., and has similar deep yellow flowers, but is smaller in all its parts, especially in the much shorter tube of the sepals.—*Kew Bulletin*, 1891, p. 197.

Bulbophyllum denticulatum, Rolfe, is a small species from Sierra Leone which was sent to Kew last May by Mr. James O'Brien, of Harrow. The flowers are about three lines long, and are borne on a somewhat drooping spike. The sepals are pale purple-brown, the petals white, with strong purple mid-nerve and very narrow purple denticulate margin, and the lip orange. The name is given in allusion to the denticulate petals.—*Kew Bulletin*, 1891, p. 197.

Bulbophyllum nigripetalum, Rolfe, is a distinct and remarkable species, with the petals and lip of a uniform purple-black, in allusion to which the name is given. It was introduced from West Africa by Messrs. F. Sander & Co., of St. Albans, and grown by Mr. James O'Brien, with whom it has flowered on two or three occasions. In habit it somewhat resembles the preceding, but has longer racemes, the scapes and ovaries are glaucous green, and the sepals pale yellowish white, with light maroon lines.—*Kew Bulletin*, 1891, p. 197.

Megaclinium Clarkei, Rolfe, is a native of west Africa which flowered in the collection of Major Trevor Clarke, of Daventry, during May of the present year. It is allied to *M. oxypterum*, Lindl., but differs in various details. The flattened rachis, which is the most remarkable feature of the genus, is four lines broad, light green down the centre, with purple-brown spots, almost wholly purple-brown near the margins, and the flowers somewhat similar in color.—*Kew Bulletin*, 1891, p. 198.

Megaclinium leucorachis, Rolfe, is a remarkable species, with the rachis nearly white, quite unlike any other, and, therefore, named in allusion to this character. The flowers are deep yellow. It flowered in the collection of Sir Trevor Lawrence, of Burford Lodge, Dorking, in May, 1890, and, like other species, is probably a native of some part of Africa.—*Kew Bulletin*, 1891, p. 198.

An Orchid Nursery.

The steadily growing popularity of the large and beautiful Orchid family is one of the features of modern horticulture, and no one who has not actually seen with his own eyes can realize the vast resources of some of the trade establishments devoted to their cultivation. One of the finest of these is that of Messrs. F. Sander & Co., of St. Albans, England, situated within easy distance of the metropolis, yet outside the range of those fogs which have proved so disastrous to the flowers of many fine collections during recent years. Here may be seen between three and four acres of glass devoted almost exclusively to Orchids, for the heating of which four miles of hot-water pipes are required. The houses, which range from 240 to 300 feet long, and are divided into suitable compartments, run at right angles from a long corridor of nearly equal length. They are constructed with special reference to the successful cultivation of Orchids; every point which promises to be of service being carefully considered and carried out substantially but economically, so that they serve as models for those who wish to cultivate these plants successfully. That the various changes introduced have been improvements is evident from the robust health of the plants; dark green leaves and plump, hard pseudo-bulbs being everywhere visible, and giving promise of abundance of flowers at the proper season. Mr. Sander and his manager, Mr. Godseff, seem to have proved by long experience that the most refractory subjects are amenable to cultivation when properly treated; and they lose no opportunity of ascertaining under what conditions the plants grow in a wild state. Many reputedly difficult subjects have been overcome by such intelligent treatment, among which may be specially mentioned *Phajus tuberculosus* and *Vanda Hookeriana*, the stock of each being in excellent condition.

Cool Orchids are here a special feature, and Odontoglossums may be seen in thousands. Between 2,000 and 3,000 plants of *O. grande* are now in the nursery, and a far greater number of *O. crispum*, while other desirable kinds are represented in quantities which make one wonder where they can all possibly go. Last May I here saw 5,000 plants of *Miltonia vexillaria*, and most of them in full flower, and the sight is one not easily to be forgotten. The graceful pendulous racemes of a thousand plants of *Odontoglossum citrosmum* hung from the roof of the long corridor in masses, and served to recall the glowing description given by Roezl, who met with it during his travels in Mexico. "Great was my surprise," he writes, "to see the trees clothed with a profusion of Orchids, which proved to be *O. citrosmum*, whose pendulous spikes, a yard long, were adorned with innumerable white and lilac flowers, which perfumed the air with their delightful fragrance. The stoutest branches of the Oaks were literally loaded, and it was a pleasure to see the profusion of flowers produced by these plants, a single spike bearing upward of thirty expanded flowers. During several days' march we noticed that all the Oak-trees were clothed in this way by this same Orchid, which flowers the more freely when it is exposed to the direct rays of the sun."

A somewhat novel feature in this establishment is that many of the New Granadan Odontoglossums are planted out in prepared beds of fibrous peat, and they evidently like it, for each new pseudo-bulb is much stronger than the preceding one, and on some of the plants being pulled up they presented quite a mass of healthy roots. In this way small pieces are grown into vigorous plants, and many of them are producing strong flower-spikes. Most of the best species and varieties are grown in quantity, at least 75,000 plants being in stock.

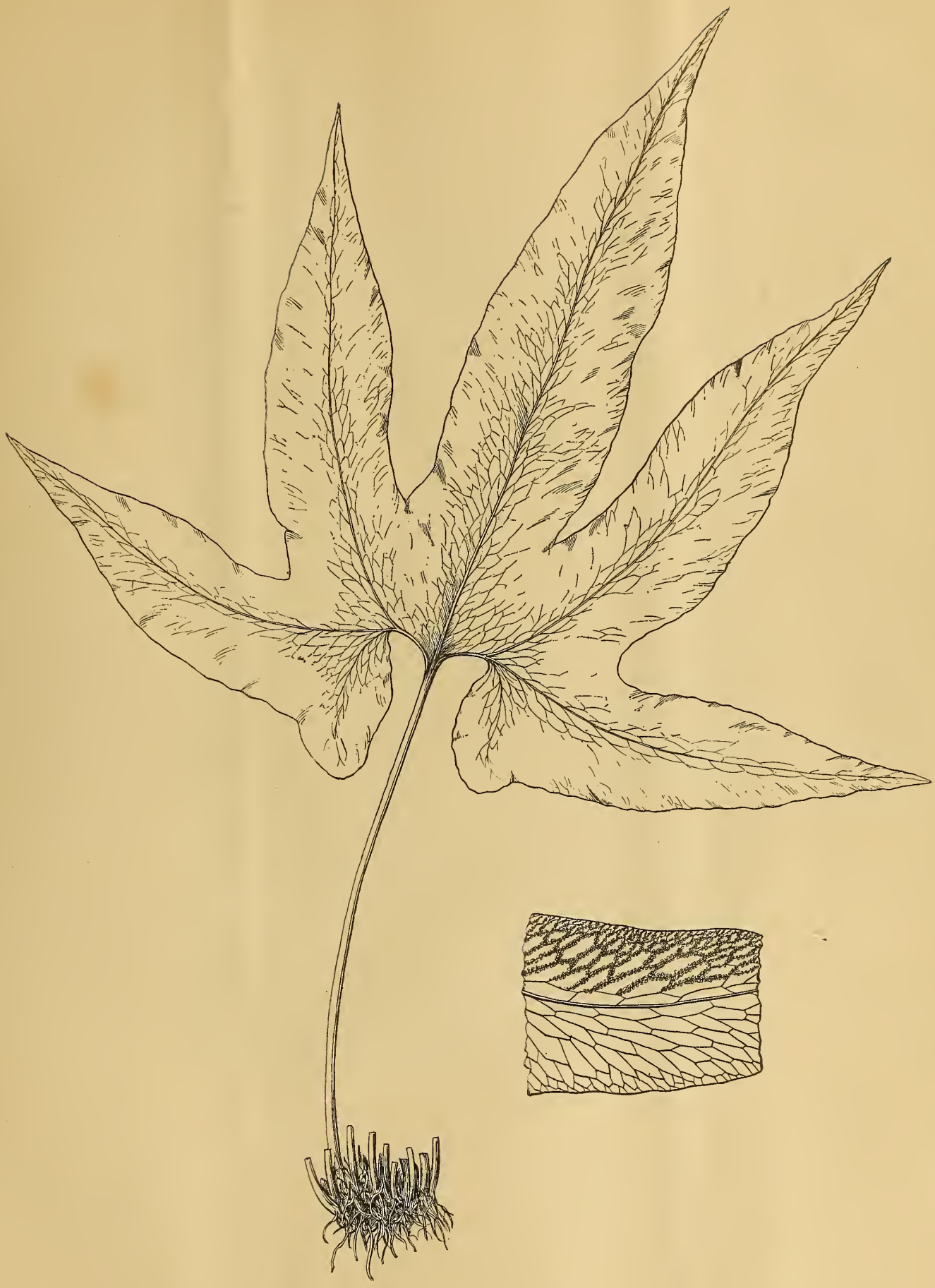

Fig. 75.—Hemionitis elegans.—See page 484.

The number of Cattleyas and Lælias in stock is estimated at over 50,000. Cypripediums, Dendrobiums, Vandas, Cœlogynes, Lycastes, Phalænopses, Angræcums, Masdevallias and other popular garden genera are also grown in immense quantities.

At all seasons of the year there is much of interest to be seen here, and a visit during the comparatively dull season of August proved no exception to the rule. Many species and hybrids of Cypripedium were in bloom, including the chaste little *C. niveum*, *C. tonsum*, *C. Parishii*, *C. Curtisii*, also *C.* × *picturatum*, *C.* × *Javanico-superbiens*, *C.* × *Hornianum*, *C.* × *Io*, *C.* × *vexillarium* and many others, some of them in quantity; also *C.* × *Maynardi* and *C.* × *Pollettianum*, two very fine ones raised in the establishment, which have recently received awards at the hands of the Royal Horticultural Society, and which, together with the equally beautiful *C.* × *Castleanum*, are to be figured in an early number of the *Reichenbachia*.

A large batch of *Cattleya Gaskelliana* was finely in bloom, including the chaste variety Albens; also *Cattleya Eldorado*, *C. Dowiana*, *C. velutina*, *C. porphyroglossa*, *C. Schofieldiana*, *Lælia crispa*, *L. monophylla*, *L. elegans* and *L. Schilleriana*, some of them in varieties of great beauty.

A healthy batch of *Vanda Hookeriana*, well known as a difficult subject to cultivate, was observed, some of the plants being in flower. A very interesting sight in one of the houses was a group of the remarkable Swan Orchid (*Cycnoches chlorochilon*), many of the plants being in flower, and among them two females, in which the column is very much shorter and stouter than in the males. It appears that while the latter have been known for so many years, the former have not been observed before the present season.

Several distinct varieties of the beautiful *Odontoglossum Harryanum* were in bloom, but among many of the better-known forms was a plant of the rare natural hybrid, *O.* × *Horsmanni*, a specially interesting subject, whose parents are believed to be *O. Pescatorei* and *O. luteopurpureum*.

Until quite recently the seedling Orchids and some others have been located in a smaller nursery some distance away, but during the present summer new houses have been erected, so as to have the collection all together. Part of the plants had been duly installed at the time of my visit, and in some respects this proved to be the most interesting part of the establishment. Here are hundreds of seedlings of various kinds, some of them from the choicest crosses, from which many novelties may be expected in the future. Some of the crosses pointed out were between distinct genera, and their flowering is awaited with considerable interest. A large stock of patience, however, is required in this work, for it is by no means an unusual circumstance for a seedling Orchid not to reach the flowering stage until it is from five to ten years old, though some arrive earlier at maturity.

Mr. Sander has introduced to cultivation many very valuable Orchids, among which may be mentioned *Maxillaria Sanderiana*, *Odontoglossum Sanderianum*, *Phalænopsis Sanderiana* and *Vanda Sanderiana*, and he has lately re-introduced the genuine autumn-flowering *Cattleya labiata*, so long supposed to be exterminated.

London. *Visitor.*

Cultural Department.

Cabbage and Cauliflower Plants.

PLANTS of Cabbage and Cauliflower intended to be wintered over in frames, from seed sown in September or October, ought to be gotten into their winter quarters by the 1st of November, so as to get fixed and at home before severe weather sets in. The plants should be set quite thickly. We usually put about 800 plants under a three by six-foot sash. The plants should be set, where frosts are severe, so as to cover the entire stem in the soil, or they may be split and made worthless by freezing. After placing them in the frames keep the glass off as much as possible, to harden them. The object is not to make them grow much in the frame, but to keep them in a semi-dormant state, so do not clap on the sash as soon as light freezing occurs. If gradually inured to the air, a temperature during the winter of twenty-five degrees under the glass will not hurt them, but if started into a tender growth by being kept too close they will be injured by the slightest freezing. Cauliflowers are rather more tender than Cabbages, and need closer attention in severe weather.

From Baltimore southward the practice is to set Cabbage-plants in the open ground instead of frames. Ridges running east and west are made with a plow in well-prepared and highly manured land, and the plants are set thickly upon the south side of the base of the ridge, so as to allow for some loss by winter-killing and running to seed, which sometimes happens when the seed is sown too early and too much growth is made before cold weather. The ridges are worked down and the plants cultivated by horse-power in spring. The practice of sowing Cabbage and Cauliflower-seed in fall for wintering over in frames at the north is not now so extensive as formerly, because it has been found that plants from seed sown in hot-beds or greenhouses in February and hardened off in cold frames are better, and but little later, than those wintered over. Even in this latitude, Cabbage-seed sown January 1st in greenhouses and hardened off in cold frames, so as to be set out by the middle of February, will give nearly as early and a much more certain crop than the fall-sown seed.

But for Cauliflower frame-culture here is far the best. For this we set the plants in a three by six-foot sash, for they are to head there, and fill in between them with Lettuce for heading, and later on sow Onion-seed for transplanting. The Cauliflower-plants are kept in a moderately growing state through the winter, and are gradually inured to the air by exposure on all occasions when there is no hard frost, which will here be nearly always in daylight, and by the last of February they are stripped entirely of the sashes, which are transferred to other frames to protect the early Tomato-plants. Plants of a good strain, such as the Snowball or Erfurt, will head very uniformly in March and early in April. The chief danger is in getting them stunted or checked, which causes them to "button" or form little worthless heads in February. The Lettuce will usually be cut out by Christmas, and the Onions transplanted in February.

Raleigh, N. C. *W. F. Massey.*

Roses.

THE extremely hot weather which prevailed during a large part of September has doubtless injured many Roses now in preparation for winter flowering, for the growth made during that period will mostly be thin and weak, and therefore more liable to attacks of disease. The sudden change, too, from very warm to chilly nights and more seasonable weather will be very likely to produce mildew unless strict attention is paid to ventilation and heating, and it is at such a time as this that sulphate of lime proves useful as a mildew remedy. There is not enough heat in the pipes to generate fumes from sulphur sprinkled on them, and dusting the plants all over with sulphur makes them unsightly. Syringing the plants with sulphate of lime in solution, however, leaves but a slight deposit on the foliage and soon stops the spread of the fungus. A good formula for the preparation of this mixture is the following: Slake five pounds of lime in six gallons of water, add five pounds of flour of sulphur, and then reduce the whole by boiling to two gallons. This should be allowed to settle, after which the clear liquid may be bottled off, and thus kept ready for use, in the proportion of one thumb-potful of the liquid to two gallons of water, to be applied with a syringe as the necessity arises. This preparation has a somewhat unpleasant odor, but this remains for a short time only, and as the treatment is more effective when applied late in the afternoon or evening this disadvantage is but slight.

Green-flies will also appear from time to time, and as the Roses will not yet be in flower, unless an early crop is desired, fumigation will be found the cleanest method of disposing of this pest. Later in the season fumigating should be dispensed with, for the blooms of most Roses are easily injured by this process, being either crippled in the bud or having their color bleached out. Among those specially susceptible to injury are Catherine Mermet and The Bride. To overcome this difficulty the evaporation of tobacco-water in vapor-pans placed on the heating-pipes has been tried with excellent results, since the vapor so produced is deadly to the green-fly, and does little, if any, damage to the flowers.

Neat tying and staking adds much to the appearance of a Rose-house. The neatest method undoubtedly is that of stretching wires from end to end of the beds, in line with the plants, to which the plants are tied as their growth demands. This plan does away with stakes, and allows full play for light, air and water among the foliage.

The subject of fertilizers is one that is not easily settled, for much depends on the kind of soil with which the beds have been filled. Where the compost is of a clayey nature it is not well to give a heavy dressing of stable-manure, for in this way the soil may become sodden, while a more concentrated manure may give a much better result. Hen-manure, sheep-manure, bone-dust, wood-ashes and many of the standard manufactured fertilizers are valuable, but their use should be guided by experience, for no hard-and-fast rules can be laid down for the application of special manures.

Some fire-heat will now be required, at least when the thermometer shows much below fifty degrees at night, but the sun being still strong at midday, some care is required in order to prevent the house from becoming too hot at that time, and it is during such weather as may be expected now that some of the advantages of steam-heating become manifest, because this heat can be so readily shut off from the pipes.

Pot-grown Hybrids for early flowering will soon be in condition for starting, since the hot, dry weather of the past month has rather favored the early ripening of the new growth, but it should always be borne in mind that the ripening process may be overdone, for if the wood is allowed to shrivel for want of water there will be little prospect of a satisfactory crop of flowers.

Holmesburg, Pa. *W. H. Taplin.*

Fig. 76.—Habenaria carnea.—See page 484.

Hardy Bulbs.

IF not already in the ground, the bulbs of Tulips and Hyacinths, in the colder states, should be planted as soon as possible, or by the end of October at the latest. Tulips, as seen in our public gardens and parks, are gorgeous while they last, and are eminently suited to such places, and they are often planted largely in private places, and this is the reason that other bulbs have been so long in the background. Tulips are often planted for one season's display only and then thrown away, but it is a very easy matter to plant them somewhat deeper when they can remain in the beds permanently. The bulbs will increase and the quantity of flowers will increase annually if a good top-dressing be given to the bed in the fall, as recommended for the Narcissus. In light soils a depth of six inches is ample for Tulips, but an inch less is better if the soil be of a retentive nature. If it is desired to plant the bulbs in geometrical or other designs the soil must be entirely removed from the beds to the necessary depth, leaving the centre of the bed higher than the margin, just as the surface will be when the bulbs are covered, otherwise the centre bulbs would be covered deeper than the others and they would not flower together. Care must be taken not to tread the soil too hard while planting, or a free root-action will be hindered.

If it is necessary to enrich the soil in the beds it is best done by adding the fertilizers after the bulbs are just covered with soil and before the top-covering of soil is laid on. Most bulbs are very impatient of being brought into direct contact with manure. I always like to place it over them, that the roots may have the nutriment washed down to them by the rains. If there is the least germ present of what is known as the Lily disease, or basal rot, in Narcissus, it seems to me highly important that decaying animal or vegetable matter should not be allowed to come in contact with the bulbs. In cold heavy soil a good sprinkling of sharp grit, or sand, should be placed underneath the bulbs, and the young roots will start out with more vigor and spread rapidly. Bulbs of any description, indeed, cannot be grown in a soil that contains excessive moisture in winter or summer; under-draining is in such a case imperative. Care must be taken that all the manure used is thoroughly decomposed, for in such material as half-decayed stable-manure field-mice are apt to find a happy hunting-

ground, and they are exceedingly fond of Tulips and other choice bulbs.

All these directions apply equally well to Hyacinths also, with the exception that Hyacinths, though they flower for two or three years, are never so good as they are the first season, and cannot be relied upon for permanent planting as Tulips and Narcissus can. It is scarcely necessary here to name varieties, as these are always well described and classed as to season, height and color in all bulb-catalogues, and it would be but a repetition here, but I would like to suggest a trial of the species of Tulips, even if only a few of each be planted. They are quite distinct; many are both curious and beautiful, most of them flower late, and all are worth growing. I refer to such species as *Tulipa Gesneriana*, *T. Greigii*, *T. Turkestanica*, *T. Oculis-solis*, *T. cornuta*, *T. lutea*; *T. Clusiana*, *T. Florentina*, and a few others. *T. Greigii*, the "Queen of Tulips," is especially beautiful in flower and foliage. The Parrott Tulips, though they are unfitted for in-door culture, are very much admired and useful for cutting. These succeed well in the open ground when the soil is not too rich.

South Lancaster, Mass. *E. O. Orpet.*

Planting Hardy Bulbs.

IT is an error to defer the planting of hardy spring-flowering bulbs until the earth has become lowered in temperature by the wet and cold of the late autumn months. There are cases where the planting of some bulbs cannot be done much before November. Flower-beds on the grass, for instance, often cannot be disturbed before the middle of October, and when Hyacinths, Tulips, and similar things are made use of to embellish them during the spring months, the bulbs can, of course, only be put in the ground when the summer occupants are cleared off. Even at this time, however, there is still some warmth in the ground, much more than a month later, when the soil generally comes down to such a low temperature that bulbs planted then will frequently remain until early spring before making roots. This, I think, must exercise a deteriorating influence on the blooming powers of any bulbous plant that flowers in spring. It is not at all natural for Narcissi, Hyacinths, etc., to pass the winter in a rootless condition, and when they do so they are at the mercy of an inclement winter. Being so hardy, they will not show the effects of cold and wet in such a marked manner as Lilies, for instance, but I am convinced that if a portion of the bulbs are planted at any time during the next six weeks, and the remainder at the beginning of the winter, there will be a sufficiently marked difference in the earliness and quality of the bloom to fully prove the importance of early planting. There is no time so good as the month of September for getting the bulbs in the ground, and I think that this is more especially true of Narcissi; the majority of these begin their season's work in that month, as may be ascertained by taking up a bulb or two.

Some bulbous flowers, such as Crocuses and Tulips, do not apparently suffer by being kept out of the ground during the early autumn months, but I am convinced that Narcissi, more especially those that belong to the Daffodil group, deteriorate more or less if kept out of the soil until winter arrives. Those kinds that love plenty of moisture at the roots when growing appear to feel a lengthened absence from the earth most acutely, and if not planted by the end of October good flowers cannot be reckoned upon. It is the same in pot-culture. Many persons make a point of potting their bulbs at intervals of a fortnight, so as to insure successional bloom, but this is bad practice and unnecessary as regards the result aimed at. It is better to pot them all early, and regulate their blooming season by other means, which can, of course, be easily done, and thus have the advantage of thoroughly well-rooted plants.

Opinions vary as to the depth at which the bulbs should be set in the ground, and no absolute rule can be made in this matter, not even for any one particular kind of bulb. Soils vary infinitely, and when I see the recommendation that Hyacinths should be planted three inches deep, I know that the writer is thinking of those close heavy lands into which warmth penetrates but slowly, and from which superabundant moisture passes away with difficulty. In porous soils Hyacinths may be planted from four to six inches deep, and will be more likely to do well than when set nearer the surface, as they are not likely to suffer so much if the weather is hot and dry at blooming-time. In my light soil I have planted bulbs that had bloomed in pots quite eight inches deep, and they come up and bloom very well every year. Tulips should not be planted quite so deep, but the stronger-habited Daffodils, such as Horsfieldi, Emperor, the common Lent Lily, etc., have always appeared to me to grow much stronger when planted about six inches deep. Where the Lent Lily grows naturally it is seldom found nearer the surface than this. I once had the curiosity in a copse where thousands of this Daffodil were in bloom to see if I could find any bulbs near the surface. With the exception of the very small ones, I failed to find any at a less depth than six inches, which would seem to indicate that in the case of this Daffodil at least there is a tendency on the part of the bulbs to work downward as they get older. I do not see how it can be otherwise, as the seeds, of course, germinate quite near the surface.

It is as difficult to determine the depth at which all the Narcissi should be set in the ground as to decide what kind of soil and position best suits each particular kind. I am convinced that the more delicate kinds dislike to be deeply buried in the ground. It is courting certain failure to plant such kinds as Cernuus, Moschatus, Mary Anderson, Leda and others in heavy land at the same depth as the gross-growing Sir Watkin or Emperor, and even in light soils I find they do better when not more than three inches of earth covers the bulbs. In their case success or failure may entirely depend on the influence that the sun's rays exercise on the bulbs both when in growth and during the resting period. The Lent Lily, the old double Daffodil, the Tenby, and a few others will thrive in positions where the bulbs are screened from the sun when at rest, but under such conditions kinds of a less robust nature will die out. A certain amount of the ripening process that is indispensable for many bulbous flowers would appear in their case to be necessary. In retentive soils they cannot feel the influence of the sun's heat to an appreciable extent, unless the bulbs are set within two or three inches of the surface. I have had no experience of basal rot in Daffodils, and with some kinds and in certain soils it may not be possible to absolutely guarantee every bulb from its attacks, but it is reasonable to suppose that an immature condition of the bulbs will favor its development, and more especially if they are encased in a mass of sodden soil during the winter months. In an interesting note on this subject in a recent issue of *The Garden*, a correspondent observes, "I have no doubt that the failure of these bulbs is to be attributed to the want of sun and undue moisture," and I would, therefore, recommend a trial of shallow planting in the case of kinds that are liable to this disease. —*J. C. B., in The Garden, London.*

The Hardy Plant Garden.

AT every season there are hardy plants which are pre-eminent, and in the late fall no other, at least among the tall-growing kinds, are as attractive and useful as the Japanese Anemones, furnishing as they do an abundance of handsome flowers just before the glory of the Chrysanthemums begins. Other flowers there are, of course, in various stages of perfection. The hardy Gaillardias, as for months past, are still in profuse bloom, their large flowers showy but somewhat coarse. A few perennial Asters still linger, *Anthemis tinctoria* displays a profusion of its yellow stars, *Campanula lactiflora* and *C. rotundifolia* are still covered with flowers; *Plumbago Larpentæ* will only cease to unfold its pure blue flowers when frozen; *Achillea rosea* and *A. ptarmica*, Tricyrtis, a few Phloxes and Epilobiums give stray bits of color, with no signs of suffering as yet from autumnal winds. But among them all the Japanese Anemones stand in queenly grace, though not at their best this year, owing to the dry season, for they require a somewhat moist location.

If one had the room a very pleasing effect could be made with a bed of Japanese Anemones, with, perhaps, the blue flowering Autumn Monkshood (*Aconitum autumnale*) as a foil, bordered with broad masses of Autumn Colchicums and Crocuses. With fair weather such a bed would prove bright and attractive in the "melancholy days" of the year. Ah! that weather—a subject never worn to the grower of hardy plants, which disarranges our best-laid plans and handicaps us in every cultural struggle. When the Government's rain-makers return to observation perhaps they may have so mastered the elements that we may have climates turned on to suit, and in those happy days advice as to cultural details may be of some value. At present out-of-door gardening is a hit-or-miss affair at best, and one does what experience teaches is the best average practice, with sometimes queer results. For several years my Chrysanthemums were nearly drowned out, as they were planted on the level, and this led me to plant them in raised beds. Since adapting this practice we have not had enough rain during the growing season to keep them in good health. If I have advised any one heretofore to grow

Chrysanthemums in raised beds I hereby withdraw that counsel.

This year we have had two very dry periods in this section, the present one and one in the spring, just at the time when we were trying to establish small plants. A pretty bad failure at this critical period with some Mossy Saxifrages leads me to note a device which I noticed too late to try, but which would probably be a happy expedient in a dry season with plants which require a fair supply of moisture. It consists in placing near the plant a water-tight pot, to be filled with water. Loose strands of cotton lead the water by capillary attraction in a gentle flow to the plant and keep up the moisture necessary to its growth in a dry season. This is commended on grounds of expediency rather than of æsthetic principles. But there are occasions in the hardy garden when ideas of beauty must give way to those of utility. Here is the question of labels, for instance, which at this season are apt to be especially prominent. Not every hardy garden is necessarily a "collection of labels with plants behind them," but where many varieties of plants are grown and carefully marked the garden is apt to take on the appearance of a miniature cemetery, and quite unavoidably. There are labels and labels, and which is the best one is yet an unsolved problem; the fact being that there is no one best for every purpose. The worst is probably the wooden one of the dealers, cheaply made of a soft sappy wood, which will scarcely last through the season. Probably the best label for new plants, or those one wishes to keep in prominence, is a cedar label, made of sufficient length to hold well in the ground during a thaw. If it is painted, so much the better. The name should be written firmly with a soft pencil, and will be legible for several years if well done. Where plants are more familiar, or one seldom has to refer to the name, a thin copper tag, fastened to a brass wire a foot long, is an inconspicuous and useful label. The wire is easily thrust into the earth and holds the tag securely near the ground, where it is readily found when wanted. With a smooth point one can write on the tag placed on a yielding substance, and the writing cannot be effaced. Tags without the wires may be bought or may be easily and cheaply made by any one, the sheet copper being sold by hardware dealers.

There are people who love flowers and garden without labels, but without any disrespect to a deserving portion of the community, I make bold to say that among these are a great number who know a number of things that are not true. The label habit tends to accuracy, and in the end it will add to the interest of any garden.

Elizabeth, N. J. *J. N. Gerard.*

Correspondence.

A Fairy Candelabrum.

To the Editor of Garden and Forest:

Sir,—This is the season when it is interesting to study the various means adopted by nature for disseminating seed. One need not be a botanist to notice the difference in form and the delicate beauty of many of these waifs of the wind, usually unheeded and unnoticed because of their very profusion.

Especially charming and attractive, as its seeds mature and flit away, is the Fireweed, *Erechtites hieracifolia*. A little while since it was a rank and coarse herb, with flowers of dull white, that we passed without bestowing on it a second thought. Now, the flowers having withered and vanished, we are attracted by the tall plant, untouched by frost, that raises on finely grooved stems countless exquisitely shaped green urns, with delicate-hued tops, soft as the downiest velvet.

Let us take home a branch to watch at our leisure its further development. We put it in a glass of water, set it in a sunny spot and place a glass globe over it, for, as the pappus expands, just as the lights of a candelabrum are kindled one by one, the slightest current of air would send the fleecy seeds fluttering in every direction, and the beauty and symmetry of the dainty white spheres would soon be destroyed.

We notice first a slit down one side of the green involucre; presently it grows wider, and one after another of the fairy-like company confined within presses out of the narrow aperture to get a glimpse of the world. One green scale after another is forced out and back, till they are all wholly concealed and lost to view in the perfect downy sphere of snowy white that stands where the green urn stood an hour ago. Another urn, and another, changes in the same way before our eyes in the next hour, and our candelabrum begins to put on a festive appearance. The illumination goes on regularly and symmetrically too, the first globe of glistening white appearing at the summit, then others at regular intervals around and below, each being the terminal head of a side branch.

If called away for an hour or two we find on returning a marvelous change, more than half, perhaps, of the candelabrum being lighted up. It may be a day or two before the smaller and least-developed heads will fully mature. Meanwhile those that opened first will begin to fall. With fairy-like grace each fleecy tuft slowly settles to its place, as if half-inclined to soar aloft instead of being drawn downward by the tiny brown kernel with which it is weighted. How lightly they lie heaped one above another, and how rapidly does the heap get higher and higher! How fastidiously do the later comers roll slowly along over the feathery mound, till they find just the right spot in which to rest! This miniature snow-storm within doors is lovely and fascinating beyond description, and sometimes it will go on slowly and unceasingly for several days or a week. Sometimes, on the other hand, the heads will develop more rapidly, and the seeds will all have fallen by the second or third day.

The globe to keep the flying pappus within bounds is not absolutely necessary. If the vase be placed on a tray in a retired nook, where no current of air can come, most of the pappus will fall on the tray.

When the last white pappus has fallen down, and we tire of the beauty of the airy heap that lies high-piled and motionless, we can open the window and lift the globe, and the gossamer stars at the first breath of wind will float away, glittering in the sunshine.

Gloucester, Mass. *Sarah G. Duley.*

Recent Publications.

THE ordinary varieties of the garden Cucumber, particularly the White Spine, are sometimes grown in this country for winter use, but the so-called English varieties, which are altogether superior for forcing, are practically unknown, except to a few persons who grow them for the large cities. We are, therefore, gratified to find a late bulletin of the Cornell Experiment Station devoted to the forcing of the English Cucumber, which represents the highest type of this vegetable, and which is so distinct in appearance from our own kinds that novices often fail to recognize some of its forms as Cucumbers. Sion House is the variety which Professor Bailey grows most largely. It is of medium size, being from a foot to fourteen inches long at maturity and smooth and regular. Another favorite variety is Telegraph, which is slender and handsome, ordinarily reaching a length of eighteen or twenty inches. Kenyon is another slender variety of somewhat medium length. Edinburgh is a spiny and somewhat furrowed variety, and, therefore, not attractive, although it reaches a length of two feet. Lorne is the best of the large sorts, perfect specimens of the fruit sometimes measuring nearly three feet. Some of the very longest ones are too large for convenient table use and are sometimes inferior in quality to those a foot in length, although, when grown rapidly, the largest specimens are often excellent. The flavor of English Cucumbers differs somewhat from our own field sorts, and their texture is less brittle. They retain their green color longer than the field varieties, and are ordinarily picked before they attain their full growth, although they remain edible for some time after they have reached maturity.

In cultivation, the general requirements in regard to light, temperature and moisture are the same as that for forcing Tomatoes and Beans. They need a light warm house and facilities for brisk bottom-heat. At night a temperature of from sixty to sixty-five degrees is preferable, and seventy degrees to seventy-five degrees during the day, although the temperature will sometimes run up to eighty-five or ninety degrees when in the full sun and with open ventilators. Cucumbers are vigorous feeders and need an abundant water-supply to keep them from flagging, and in bright weather the air should be kept moist by wetting down the walks, to encourage growth and discourage the red spider. In preparing the beds, which are eight inches deep, an inch of clinkers and potsherds are placed on the boards, then three or four inches of partially decayed sods from an old pasture, the remainder being rich garden-soil, to which one-quarter of its bulk in well-rotted manure has been added. It is imperative that the soil be rich, because the productiveness of the Cucumber is almost entirely a question of food. If, however, the soil is somewhat sticky some sand should be added to increase its porosity.

The plants are started in three-inch pots filled one-third full of earth, and when a pair of true leaves is formed

above the rim the pot is filled, which gives more root-space and saves transplanting. When these pots are filled with roots the plants are set in the beds, and then follows the critical time in Cucumber-forcing. The young plants are subject to attacks of aphis and fungi, and any failure in bottom-heat will check them. Few vegetables require such careful attention until they are well established. The aphis must be kept off, or the plants will be ruined in a few days. If the plant is once stunted it will make a short bunchy growth at the top and the leaves will be small and yellow, and it may remain stationary for weeks, and even if it finally resumes growth it rarely becomes a profitable plant. To ensure a good stand three or four times as many plants as are needed should be started with the most vigorous ones set out a foot or a foot and a half apart. When they are established the weaker ones are destroyed, leaving the remaining individuals from two and a half to three feet apart. So long as the growing portions of the plant are vigorous, and the leaves are not mildewed, the plant may be considered in good condition, although the lower leaves fall off, giving it a scraggy appearance.

When there is room above the benches the plants are trained upon a perpendicular trellis of annealed wire, but on low benches they are trained along the roof. The vines are tied upon the wires with raffia or soft cord; two or three strong main branches are trained out and only enough side shoots are allowed to grow to cover the trellis, the remaining ones being pinched out as soon as they appear. The plants should not be overcrowded with young growth, and some of the large leaves may be taken off in the dark days of midwinter if the foliage is dense. The branches are all headed in as soon as they reach the top of the trellis or encroach upon the space allowed for neighboring plants. The two chief causes of failure are, insufficient bottom-heat and impatience for quicker results. Earliness is not a characteristic of the English Cucumber; from eighty to a hundred days elapse after the sowing of seed before the fruit is fit for the table, and from a month to six weeks is needed for the fruit to attain salable size after the flower has set. The plants continue to bear from three to four months under the best treatment, and each plant ought to yield at least eight good fruits. If they are pinched in, after the English custom, and allowed to bear but two or three fruits, the season can be extended, but it is probably more profitable to secure returns more quickly. The heavy fruits should not be allowed to pull the vines from their support, and those which do not hang free should be held up in slings, for if allowed to lie on the soil they do not color evenly.

Cucumbers are monœcious—that is, the sexes are in separate flowers on the same plant. The staminate flowers are the more numerous, and they begin to appear earlier, so that a sufficient supply of pollen is assured. Out-of-doors the pollen is carried to the pistillate flowers by insects, but these are absent from the greenhouse, and if the flowers are fertilized the pollen must be carried by hand. There is a question, however, whether pollination is advisable in the house, for it is certain that the English Cucumber will grow to perfection without the aid of pollen and without seeds. Many gardeners suppose that pollen causes the fruit to grow large and lumpy at the blossom end, where alone the seed forms, and they, therefore, aim to produce seedless Cucumbers in order to procure straighter and more shapely fruits. Professor Bailey is not able to make definite statements on these questions, although he has experimented on them for two winters. In his experience it has paid to pollinate by hand if early fruits are desired. The early flowers nearly always fail to set freely with no pollen. The method of pollination is to pick a staminate flower, strip off the corolla and insert the column of anthers into the pistillate flowers. Fruits which have set without pollination are uniformly seedless throughout, the walls of the ovules remaining loose and empty. To prevent misshapen fruits English gardeners often grow them in glass tubes, but the swollen end is not always caused by seed-bearing, and pollination on one side does not destroy the symmetry of the fruit as it does in tomatoes, for example. There appears to be a peculiarity in individual plants in this respect, and upon some individuals, where the fruits were liable to enlargement at the end, it was found that the fruits would grow to uniform thickness if they were hung up in slings.

English forcing Cucumbers cannot be grown in the fields successfully, but their smoothness and regularity, with length and vigor of vine, are good qualities, and therefore attempts were made at Cornell to cross the Sion House with the Medium Green in hopes of producing a superior sort for out-door use. The results have been interesting from a scientific point of view, but the desired variety has not yet been procured. Fruits of promise have been obtained, but they have not produced good seeds. Some of the mongrel fruits developed a tendency of the cell-walls to decay; the seeds did not mature and the pulp-tissue about them solidified. Near the apex of the fruit the placentæ tended to break away from the pod, and in the cavities decay set in, extending to the base of the fruit. All the fruits on one of the plants behaved in this manner, and in no case was the decay visible on the exterior until it extended well down the fruit. In most instances the mongrel vines resembled Medium Green, the staminate parent, more than Sion House. The fruits were generally intermediate through almost every gradation. Some of the vines bore beautiful fruits, twice as long as the Medium Green, nearly cylindrical and almost spineless, and good things are hoped from this cross.

The spotted mite, which feeds upon the under surface of the leaves, is the most serious enemy to Cucumbers under glass. It can be kept in check by using half a pint of Hughes' Fir-tree oil to two gallons of water and applied in spray. A large black aphis has been a serious pest, but this can also be destroyed with the Fir-tree oil. The powdery mildew will ruin the plants if it once gains a foothold, but this can be held in check by flowers of sulphur placed in a basin and set on an oil-stove in the greenhouse. The house is tightly closed and enough sulphur is evaporated to fill the house with strong fumes for half an hour, care being taken that the sulphur does not burn.

To the student in plant-variation these forcing Cucumbers possess great interest. They are quite distinct from all others, and yet they are known to have come in recent times from the shorter and spiny field sorts. The earliest mention made of the long-forcing Cucumber is in the *Transactions of the London Horticultural Society* in 1822, where it is stated that Patrick Flanagan, gardener to Sir Thomas Hare, sent two specimens of cucumbers to the Horticultural Society, one of which was seventeen inches in length and weighed twenty-six ounces. Mr. Flanagan states that he has frequently grown these cucumbers nearly two feet long, and yet in high perfection for the table. Seeds were given to the society, and were distributed under the name of Flanagan's Cucumber. The surprise which these fruits occasioned among a body of gardeners indicates that they were novelties. The oldest variety which is now grown appears to be Sion House, which was known sixty years ago. From this comparatively recent beginning the English Cucumbers have diverged from their parentage and differ from the common varieties in being very long and slender, cylindrical and not furrowed, spineless, or nearly so, at maturity, remaining green until ripe, and producing seeds sparingly. The flowers are very large and vigorous, the tendrils thick, the leaves broad in proportion to their length, and the full-grown ones have a tendency to make shallower sinuses than the field kind. The most remarkable peculiarity, however, is their habit of producing seedless fruits, which has already been spoken of.

Periodical Literature.

Mr. T. S. Brandegee contributes to the July issue of *Zoë*, which has only just reached us, an interesting paper on "The Vegetation of Burns," that is, the ground over which forest-fires have run. The open forests of Colorado and Montana are composed of *Pinus ponderosa*, mixed here and there with the Douglas Fir, and are often injured by fires which run through them and which burn the grass, the underbrush, and all fallen dead limbs and trunks, but without doing much injury to the trees themselves, except the young ones which are only protected with thin bark. The Douglas Fir, the Yellow Pine and a few other trees, Mr. Brandegee tells us, stand without injury a fire hot enough to blacken their trunks, while the Hemlocks and Spruces are killed by a very slight fire about the base of their stems. The inability of these last to withstand heat arises from the fact that their bark is much thinner than that of the Douglas Fir, the Yellow Pine or the Sequoia. The trees, in all of these interior forests killed by fire, become dry, and afford abundant material for more serious fires in succeeding years, and these subsequent fires being once started usually destroy everything that escapes the first burn.

The Redwood-trees of the forests of the California coast, when they are killed or burned to the ground, send up many new shoots from their roots, which soon surround the old stems with a luxuriant growth, from the midst of which the parent stem in time disappears, leaving only the circular groves characteristic of the Redwood. The forests of Douglas Fir in the coast region of Oregon and Washington destroyed by fire are in time replaced by

countless seedlings, which grow very rapidly, but in the interior the dry climate, the browsing of cattle and sheep, and the sensitiveness of the young trees to fire generally prevent the restoration of original forest-growth. In the high mountainous regions of these forests there is much Hemlock or Spruce and small trees of Douglas Fir, which are easily killed by the fires, which readily mount the steep slopes. This mountainous region, except where the soil deprived of the protection afforded by vegetation may have been washed away by rains, is more commonly covered with a new tree-growth than regions of a lesser altitude, although the new growth is not always at first the same as that of the original forest. Fire is very apt to destroy in the mountain regions the seeds of conifers, for seedlings do not appear immediately on the site of a coniferous forest, although trees of the original species gradually appear growing under the shade and protection of bushes, Aspens and other plants which first cover the burnt ground. That fire is the principal cause of this change of forest-composition is shown by the fact that when the original trees are cut and fires are excluded, young trees of the same species appear at once.

Mr. Brandegee notices that many of the trees which grow in these regions where fires prevail, and doubtless have always prevailed to a greater or to a less extent, have the power of reproducing themselves by root-suckers strongly developed. The Redwood is a conspicuous instance. The Nutmeg Hickory (*Torreya Californica*), another conifer, does the same thing, and so do the Manzanitas, the Huckleberries and the Madroña. The California Oaks, the Chinquapin (*Castanopsis chrysophylla*), the Hazel, and *Heteromelis arbutifolia*, a beautiful California tree of the Rose family, all renew themselves in the same manner, and almost all woody plants seem to reappear from their blackened roots.

The soil loosened by fire and enriched by the ashes of the destroyed forests provides excellent seed-beds for the germination of the seeds of many annual and perennial plants, and these California burns often offer the very best botanizing ground in the state; and several otherwise rather local plants are now appearing in such situations in much greater numbers and growing much more luxuriously than they have ever been known to before. Mr. Brandegee notices, as has already been done before in San Diego County, that the California Poppy (*Papaver Californicum*), such a very rare plant that it was never discovered until a few years ago on the Santa Inez Mountains, near Santa Barbara, is now growing abundantly on burns in two or three localities near San Francisco. *Calandrinia Breweri*, a rare plant from the southern part of the state, has made its appearance on Balinas Ridge and on the sides of the new trails of Mount Tamalpais this year, apparently for the first time, "magnificent plants appearing and spreading over the ground, forming mats three feet in diameter." *Silene multinervia*, a plant especially abundant on Santa Cruz Island and in a few places in the southern part of the state, has also appeared this year upon the Balinas burn on the southern slopes of Mount Tamalpais. It is not difficult, therefore, to imagine how great an influence this periodical burning of vast areas must have upon the composition and spread of the flora of the region, and such observations as these which Mr. Brandegee here records will some time or other be of very considerable historical value as bearing upon the distribution of California plants.

Pomology.

Meeting of the American Pomological Society.—III.

WE conclude our report of the meeting of the American Pomological Society with a few more extracts, necessarily brief, from the addresses delivered. Many interesting papers we must pass, for the present, without mention, and we may add that there were several important essays prepared for the meeting which were not read for want of time. Perhaps they could have been heard if the addresses which were delivered had been properly condensed, or if only such portions of them as were interesting to the audience and likely to be discussed had been read. It was suggested that hereafter some preliminary examination of essays should be made by the secretary and only such received as had substantial and permanent value.

The Wilder medals for displays of fruits were awarded as follows: to the Virginia State Board of Agriculture, represented by Henry L. Lyman, for 451 plates of different varieties; to P. J. Berckmans, of Augusta, for eight varieties of Japanese Persimmons, one plate of *Limonium trifoliatum*, two plates of Kieffer Pears; to Rev. Lyman Phelps, of Sanford, Florida, for Limes, Japanese Persimmons and a collection of Citrus hybrids and crosses; to Ellwanger & Barry for 112 varieties of Pears. The bronze medals were awarded as follows: to Charles H. Hedges, Charlotteville, Virginia, for Grapes; Luther Burbank, Santa Rosa, California, for seedling Quinces; J. T. Harris, of La Crescent, Minnesota, for Apples; Wisconsin Horticultural Society for Apples; The Jewell Nursery Company, of Lake City, Minnesota, for Seedling Apples; P. S. Dinsmore, of Riverside, California, for Apples; J. W. Porter, of Piedmont, Virginia, for Apples; and J. L. Babcock, of Virginia, for Apples.

SOME LOCAL PROBLEMS IN POMOLOGY.

Mr. Charles W. Garfield, of Grand Rapids, Michigan, delivered an address on this subject, in which he attempted to show that success in fruit-growing could only be accomplished by a careful study of the particular conditions of given localities, and that a large proportion of the failures in this business was due to the selections of varieties which were valuable elsewhere, but not suited to the particular spot in which they were planted, and to methods of cultivation which, although they might be the best practice in other parts of the country, were not adapted to local conditions. He concluded his address as follows:

I would not depreciate the value of our national gatherings in the interest of pomology, but the man who goes a long way from home to get advice as to what varieties to plant or how to manage them, is liable to be misled. His local conditions are the ones to be studied, and hence the great importance of carefully conducted experiments in our own neighborhood. All honor to the men who are willing to be pointed at as theorists, experimenters, book-farmers, etc., whose trials are but a few of them crowned with success, but whose failures are a perpetual help to their neighbors. General habits of thrift and scientific method are of the widest application, but the dealing with an individual's environment, so as to make the best possible use of his opportunities, is a problem which each one must largely work out for himself. He can only learn of his nearest neighbors, and he is greatly blest if these neighbors are broad-minded, careful people, given more to patient investigation than the elaboration of theories.

We think a great many things, in relation to fruit-growing, and often think aloud too quickly. We know very little, and even this grows less when we attempt to give it wide application. I have listened so often to discussions in which the relation of experience has taken a prominent part, and have noted so many false inferences that have brought disaster to those who attempted to utilize them, that possibly I may magnify the importance of varying local conditions, as affecting experience and counsel.

Of course, a successful fruit-grower must be well grounded in general principles in order to most quickly lay hold of his local conditions and manipulate them in his interests; but, after all, it is of the highest importance that people in a neighborhood, and all having similar conditions, should familiarly compare observations and experience, so there will be brought out a body of local doctrine—a consensus of opinion which can be known and utilized. It is uphill work trying to induce people to have more confidence in the counsel of their neighbors than in that of strangers, and often, when asked for advice by one far away, when I have referred the interrogation to the man's own neighbors, I have knocked a foundation-stone from under my fame. Still, I insist that the most serious problems we have to solve in growing fruit are those which are peculiar to our own localities, and these we must solve for ourselves. At all events, we cannot safely rely upon the counsel of strangers for their solution.

The Rev. Lyman Phelps, of Sanford, Florida, delivered an address to show that cross-fertilization affects immediately the quality and commercial value of citrus fruits. Mr. Phelps exhibited a great many oranges which were abnormal in form and in which the character of the skin and color of the pulp had been changed, and these variations were attributed to the fact that the blossoms had been fertilized by pollen from trees which bore fruit differing in size and form and texture. Mr. Lyman was so thoroughly convinced of the immediate influence of pollen that he declared that he had lost $1,500 in a single year from fruit which had been rendered defective by foreign pollen.

Dr. Erwin F. Smith, of the Department of Agriculture, delivered an address on the "Chemistry of the Peach Yellows,"

in which he explained the method of study he had practiced for four years in the investigation of the peach yellows. The rather disheartening conclusions were reached that the cause of the disease yet remains a mystery, that it is transmissible, that so far no remedy has been found for it, and the axe and fire is the only treatment that promises any relief from its ravages. Nevertheless, Dr. Smith's address was most instructive as an example of genuine scientific investigation, in which nothing is taken for granted, and every point is subjected to the crucial test of experiment, and it may be added that even the negative results obtained are of great value since they narrow down to definite limits the field in which further researches are to be made.

Mr. H. S. Williams, of Rockledge, Florida, a well-known grower of Oranges on the Indian River, read an essay to show how thoroughly adapted the mountain region of western North Carolina is to general fruit-culture. A few years ago he passed some time near the village of Bavard, in Transylvania County, which is between 2,500 and 3,000 feet above sea-level. He noticed that the Apple-trees which had been planted there, although very old, were still bearing well. Unpruned Peach-trees, some of them twenty-six inches in diameter, bore abundantly on the younger wood, and indicated that this region was exceptionally favorable for the growth of this fruit. A small vineyard on the French Broad River, with ground covered with weeds and vines never trimmed, showed a remarkable display of fruit. He therefore set out a small orchard with Peach and Apple-trees of choice varieties, and a few hundred Grape-vines, and passing through the property on his way to the meeting, he found the vines full of fruit and promising well. The Peaches were exceptionally fine, and some of the seedling Apples which he exhibited, and which had grown on the old trees after having been trimmed and cared for, were remarkably beautiful. Mr. Williams concluded that these mountain valleys of western Virginia would be found equal to any other part of the country for fruit-growing.

Notes.

Several leading growers of flowering plants in Europe have already offered to send large collections to the Columbian Fair, and Mr. Thorpe expects to have an extraordinary collection of Orchids ready for the opening of the Exposition.

The publishers of *Popular Gardening* announce that that periodical is hereafter to be merged into the *American Garden*. Mr. Long, of the first-named paper, will remain in Buffalo and continue to edit the new magazine, whose name is not announced, and the business will be conducted by the Rural Publishing Company, of this city.

An experienced grape-grower recently stated that when vines are forced into luxuriant growth the pruning should not be as close as when only moderate growth is made. In the latter case the best bearing buds are nearest the base of the cane, while in canes that have grown more vigorously the strongest buds are further away, and therefore are lost when the vine is pruned closely.

It is reported by Consul M'Lain, of Nassau, New Providence, that a machine has recently been invented by an American which will separate automatically the Sisal hemp fibre from the leaves, with ease, at the rate of 180 pounds of fibre in a day. This will remove one of the great obstacles to the profitable cultivation of the Agave, which yields this fibre in Texas, Florida, and perhaps in other portions of the United States.

Professor Georgeson calls attention to the fact that in Japan there are numerous dwarf varieties of Pines, Firs, Cypresses, Arbor-vitæs and other conifers, which are very distinct, and which differ much in habit of growth, the length of their leaves and their general appearance. The ordinary species are well known here, but these varieties are not well known, and no doubt many of them would prove a substantial addition to our garden trees and shrubs.

Mr. Meehan, in the monthly which bears his name, repeats his opinion that the disease known as Peach Yellows is caused by the attack of a Mushroom (*Agaricus melleus*) on the roots of the tree. Dr. Erwin Smith seems to have demonstrated that the disease can be transmitted by inoculation of the limbs of a healthy tree with the sap of a diseased one. It would be interesting to know how any vegetative portion of the fungus is conveyed in inoculation of this kind.

Mr. Robert Craig writes to the *American Florist* that he regards Marie Guillot as the best out-door Rose, and almost unrivaled as a pot-plant, and he also considers Papa Gontier as an excellent bedding Rose and the best red Tea Rose for out-door planting. Mr. Craig, in the same paper, states that young Palms when planted on benches from thumb-pots grow as fast again as when kept steadily in pots. When they are large enough to be placed in five-inch pots they do not suffer in the least from lifting.

Mr. Joseph A. Burton, of Mitchell, Indiana, considers mulching better treatment for his orchard than plowing, which is, after all, little more than mulching with surface soil. Under bearing trees it is difficult to plow, and roots are, to a certain extent, mangled; besides this, orchards on hill-sides after they are plowed are liable to be furrowed into deep gullies by heavy rains. Any waste material will do for a mulch, whether it is straw, sawdust, shavings, weeds, briers or rotten wood. Mr. Burton sows his ground to Clover and mows it, allowing it to remain on the ground as mulch, and when it rots it furnishes a valuable fertilizer.

The death is announced, in his sixty-second year, of Jean Baptiste Joseph van Vloxem, one of the most accomplished dendrologists in Europe, whose beautiful gardens and park, where he had formed an extensive arboretum and where many large specimens of American trees were to be seen, were one of the most interesting spots to visit in the neighborhood of Brussels. Monsieur Van Vloxem traveled extensively some years ago in this country, as well as in Japan, in some parts of Columbia and in the Caucasus. It was by him that the now well-known *Tacsonia Vloxemi* was introduced from South America, and it was to him also that we owe the introduction of the beautiful Caucasian Maple which bears his name.

A writer in the *Gardeners' Magazine*, London, speaks of the facility which the Douglas Spruce manifests for accommodating itself to various soils in Great Britain. Some of the best specimens of the tree are found in rich loam or alluvium and in sheltered situations. At Eastnor Castle it drives its roots down through the fissures of the rocks, which are just below the surface soil, and flourishes well on the moisture there found for its support. It grows with great vigor among the slate rocks of North Wales, even up to the very summits of the hills, and seems well adapted to elevated situations where even Spruce will not grow. In favored situations its growth is very rapid in Great Britain, and trees planted only thirty years have in that time reached a height of seventy feet, with a proportionate bulk of stem.

Mr. Albert Benz, in a late circular, divides Garden Pansies into six classes, according to the manner in which they are colored. The first class comprises self-colored flowers—that is, those which have an even shade spread over the whole surface of each of the petals. They may be white, yellow, bronze, mohogany, brown, purple, lavender, violet and nearly all intermediate shades. They can be depended on more largely than the other varieties to come true from seed. Shaded Pansies constitute the second class, in which the flowers have the darkest shade of a given color at the upper end of the upper petals gradually graded down to a lighter shade toward the bottom end of the lower petal. Others of this class are darkest in the centre and shade gradually into a lighter tint toward the edge of all the petals. The Three-spotted or Face Pansies include the flowers which show a distinct mask, or face, in their centre—that is, a dark spot on each side of the side petals, and a broad and larger one on the lower petal. This includes most of the English Pansies and the new French Trimardeau, a remarkable sort for the size of its flowers, which are, however, somewhat deficient in substance and richness of color. The Odier or Five-spotted, Pansies have a white, yellow, blue, crimson, or brown color and a large dark spot on each one of the five petals. To be perfect, these spots, starting from the centre of the flower, should cover two-thirds or three-fourths of its surface, and be of equal dimensions on each petal with a well-defined outline. Cassier and Bougnot have succeeded in improving this class materially in size of flowers and growth of foliage. Edged or Border Pansies have flowers with a narrow, but distinct, edging around the outside of each petal of a color which contrasts well with the ground-color of the flower. The color of the border is generally white or gold when on blue, purple or bronze flowers, and blue or pinkish on white and yellow flowers. The sixth and last class, called Fancy Pansies, have the marble-striped and flaked flowers, which are distinguished by great oddity and beauty in their coloring and marking.

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Forest Reservations.

WE have more than once called attention to the closing section of the act to repeal the timber culture laws which was approved on the 3d of March last. This section authorizes a distinct departure from the traditional policy of the Government with relation to the public forests by empowering the President, from time to time, to set apart reservations of timber lands in any state or territory wherever such public lands may be situated, and "to declare by proclamation the establishment of such reservations and the limits thereof." This power of the President has already been exercised to enlarge the boundaries of the Yellowstone and Yosemite reservations to the gratification of the great body of the people of the United States. There are many other portions of the national domain where the exercise of the executive power is quite as desirable. It is not to be presumed that the President will wield this new authority with which he is clothed without great caution, and, therefore, it is altogether fitting that citizens who are well informed and interested in these matters should recommend to him tracts of forest whose preservation seems to them essential to the welfare of the people.

We are glad to note, therefore, that a memorial has been presented to the President by the Honorable Edwin Willits, N. H. Egleston and Edward A. Bowers, representing the American Forestry Association, and by a committee of the American Association for the Advancement of Science, consisting of Professors E. W. Hilgard, C. E. Bessey, William Saunders, T. C. Mendenhall and B. E. Fernow. The memorial names five tracts for public reservation, each of which is described at some length, with the specification of its boundaries and the streams which take rise in them, together with the reasons offered for setting them apart and the names of those who have been active in urging the step. The memorialists wisely suggest, that, before definite action is taken, a more detailed examination should be made by the proper agencies in order to ascertain more fully what are the actual conditions, the best practicable boundaries, the arguments for and the objections to reserving these tracts, as well as those in other locations. They also state that such reservations cannot accomplish the object for which they are made without the inauguration of some strong and efficient administration which is capable of supplying local timber requirements, and at the same time of preventing depredations by lawless persons and desolation by fire, and the President, therefore, is requested not only to exercise his new right of reservation, but also his entire power under existing laws to protect this property and to urge whatever additional legislation may seem to him necessary for this end.

The first tract spoken of is that known as the Flat Head and Marias River Reservation. Its establishment was originally proposed in bills introduced by Senator Edmunds during the sessions of the Forty-eighth and Forty-ninth Congresses, which were passed by the Senate, in both cases, without dissent. This is a tract of some 7,000 square miles, covering both slopes of the Continental Divide in Montana, about the head-waters of the Flathead River, a stream which unites with the Missoula to form Clarke's Fork of the Columbia, and also including the head-waters of the Marias, the Teton and Sun rivers, which are affluents of the Missouri. This is an alpine tract of rugged peaks and deep gorges, where snows and glaciers are perpetual, and avalanches not infrequent. South of the middle fork of the Flathead River the western slope is covered with Fir, Spruce, Cedar, Pine and Larch, and north of this the mountains have been nearly stripped by fire. Innumerable streams, fed by the perpetual snows of the high ranges, furnish the bulk of the water-supply for the Flathead River, while the rivers on the eastern slope are of inestimable value for irrigation purposes before they reach the Missouri. All the land is now unsurveyed. If this forest-tract is obliterated by speculators and mill-men, who are now attacking it, no money can measure the disastrous results to our agriculture and commerce. If it is preserved, as proposed by the bill of Senator Edmunds, under the management of the Government the forests might be made a source of permanent income, and they would exert, for all time to come, a beneficient influence on two great rivers, and upon immense areas which only need irrigation to reward the labors of the husbandman.

The next tract is the Tulare Reservation, which covers also some 7,000 square miles along the western slope of the Sierra Nevada, enclosing the entire eastern watershed of the San Joaquin River and of the streams which flow into Tulare Lake. Petition for this reservation has been made by the California Academy of Science and by a convention of the citizens of Merced, Fresno, Tulare and Kern Counties. This is a mountainous tract, ranging from 2,000 to 12,000 feet high, with beautiful valleys and plateaus, and embracing a dozen groves of the famous Big Trees, besides the Pines, Firs and Spruces of the region. The memorialists ask for the establishment of this reservation so that those great natural wonders, the Sequoia groves, may be preserved, and because it is necessary to the maintenance of the water-supply in the valley, which is dependent largely upon irrigation for successful agriculture. Timber speculators are already recklessly cutting away the timber, and the sheep of herders are destroying the undergrowths, while frequent fires are carrying destruction over the forest-floor and obliterating vegetation of all kinds. The preservation of this forest seems to be necessary to this region, which has now been made fertile by irrigation, and which, in this way alone, can be kept from reverting once more to desert conditions.

The Surveyor-General of New Mexico and many of its citizens have advocated the Pecos River Reservation, about 575 square miles in extent, on the main Rocky Mountain Divide, and covering the Las Vegas and Santa Fé ranges. These two ranges enclose the basins of the Pecos

River with cañons, steep slopes and high peaks, one of which, Tuchas Peak, attains an altitude of 13,000 feet. The tract is not adapted to agricultural use, since its cañons are often filled with snow to a depth of fifty feet, which lies on the ground far into spring, precluding timely tillage. Although of little value for settlement, the reservation, if protected, would be a lasting source of benefit to a large region by furnishing a continued supply of wood and water, while if left to lawless invasion and unregulated appropriation the results would be correspondingly disastrous.

The Pike's Peak Reservation is asked for by the citizens of Colorado, by the Senators and Representatives of that state, and by its Forest Commission. It is situated in El Paso County, and embraces Pike's Peak, with its slopes, including an area of 357 square miles. Ranging from 7,000 to 14,000 feet in altitude, and furrowed by deep gorges, it is unfit for agricultural use, the few small parks adapted to grazing having been already taken, and it contains no valuable land to be withheld from settlement. Thirty thousand people now depend on this forest-area for their supply of timber and fuel, and here originate many streams which furnish water indispensable for hundreds of thousands of acres of land besides the water-supply of many thriving towns and communities in a country where water needs to be husbanded. These supplies are now threatened with extinction by loggers, who are cutting the timber illegally and wastefully, and a railroad which has recently been extended to the summit of the peak will insure its more rapid destruction. Besides this, Pike's Peak has rare attractions in its scenery, more than ten thousand tourists having visited it during the past year, and it should be preserved in its present wooded condition as one of the healthful and pleasurable places of resort in the great west.

We have already spoken of the Minnesota Reservation which is proposed at the extreme northern part of that state extending from the international boundary, including the head-waters of the Mississippi, and comprising some six millions of acres. The region is generally covered with forests of larger or smaller growth, but there are many lakes and marshes, and little of it is suited for agriculture. This fact makes its preservation advisable for productive forestry, as much of it is useless except for wood crops. Its preservation is also necessary to maintain a supply of water for the sources of the Mississippi and minor streams, and to preserve for adjacent farm-lands conditions of atmospheric humidity and protection against the cold winds of the north.

There need be little fear that too many forest-reservations will be set apart under this new law. The most we can hope is, that the woods, which now stand as a protecting cover to the highlands where a few of the tributaries of our great rivers have their source, may escape those attacks of man and beast which have already swept away the forests which were once doing the same beneficent service to many other streams. We are convinced that the question of forest-preservation is not surpassed in importance or urgency by any which has been or is likely to be brought in the near future to the notice of Congress. But the prospect of adequate legislation seems almost hopelessly remote. We trust, therefore, that the President may see his way clear to give favorable consideration to the letter and spirit of this memorial.

It is somewhat surprising and a very interesting fact that at Barnard College (the Woman's Department of Columbia College in this city) more students are enrolled in the botanical classes than in any others. The recently issued report of the institution shows that it numbers nineteen botany specials as against seven freshmen, twelve sophomores and seven chemistry specials.

When the college opened in the autumn of 1889 it possessed a well-equipped botanical laboratory, given by the Torrey Botanical Club. Two hundred dollars have since been given by Mr. C. Neustadt for the purposes of this laboratory, and it is under the competent direction of Dr. Emily L. Gregory, who is a graduate of Cornell University and holds her doctor's degree from the University of Zurich. "This laboratory," says the report, "opens to women special facilities, not found elsewhere in this country, for the study of the physiology and anatomy of plants through a systematic course, leading to the successive degrees given for similar work in other branches of science. The course includes two years of undergraduate work and two years of graduate work. There are now studying in this department nineteen students, three of whom are doing graduate work and will later enter upon the work of original research." That these young women are serious and well-prepared students is shown by the fact that, to be admitted to the departments of botany and chemistry, candidates must pass the regular entrance examination of the college, unless it is otherwise ordered in special cases, and that "a student taking the degree of Ph. D. in botany is supposed to have gone over the entire known ground of the science, to know what questions are yet to be solved and to have some practical knowledge of the methods of solving them, so she may be ready to make original investigations. The minor studies are taken," the report continues, "in order to insure a knowledge on collateral or cognate branches sufficient to enable her to grapple with the problems of the major subject," and these cognate studies include chemistry, zoölogy, physics and mathematics, while the candidate for a degree "is supposed to have a solid foundation of university studies already laid."

As regards the value of a thorough study of botany to young women the report quotes Dr. Gregory as saying: "Aside from its value in a purely intellectual way, it has a practical value in furnishing occupation, with remunerative salaries, to an increasing number of persons. One of these fields is that of pharmacy. Adulterations are constantly made in the use of drugs, and we are just learning the importance of a methodical study of the inner structure of plants. This also applies to the students of medicine, but more particularly to the pharmacist. A much wider field for trained botanists is found in our agricultural stations. In the Agricultural Department in Washington one of my former students is now doing work in mycology, and her position commands a good salary. The call for this work is the increasing devastation made by parasitical plants on our grains and food-plants. Before anything can be done to prevent failures in crops from rust, smut, blight and mildews, the nature and habits of the parasite plant must be known. Such investigations are made and the results published in journals, and the scientific advancement of the country may be marked by the number and worth of such publications. In every state these experimental stations have been started. The work of the botanist is such that a woman is specially fitted for it."

Great Hill: A New American Country-seat.—I.

The interesting letter which you recently published under the title "Gardening on the Shores of Buzzard's Bay," tempts me to write you a description of a country place in this same region which is remarkable because "gardening," in the usual acceptation of the term, has played no part in creating its beauty. It is, I am sure, one of the most attractive country-seats in New England, partly because of its size and its unusually fine situation, but largely because it has been developed out of wildness with so singular a degree of taste and so keen a feeling for the character which Nature had indicated. No one has been more in sympathy than I with the counsels so often given in Garden and Forest relative to the necessity of employing a landscape-gardener when a piece of wild nature is to be adapted to human habitation and given an artistic aspect. But there is no rule without its exceptions, and the place in question, belonging to Mr. Albert W. Nickerson, of Dedham, shows that while most men must be educated to the possession of taste, some are born with it, and are justified in dispensing with professional assistance. No hand but the owner's has touched Great Hill, and the result

is a domain whose beauty is as uncommon as it is striking, as natural as it is artistic.

If you look at a map of Buzzard's Bay you will see at its inner end, lying west of the arm into which the Wareham River flows, a promontory which is divided into two points by the deep indentation of Wing's Cove, the easterly one called Great Hill and the westerly, and longer, one called Sippican Neck. A few years ago Mr. Nickerson purchased a small hotel which stood near the extremity of Great Hill, so named, by the way, because, although the plateau it forms is only 127 feet above the sea, it is the highest ground in this neighborhood. To the land attached to this building Mr. Nickerson has gradually added until his property now covers some 1,500 acres, includes the whole of Great Hill, extends along the western shore of Wing's Cove, and, owing to the presence of the cove, boasts of some six miles of water-front. It is only a few weeks since I wrote for GARDEN AND FOREST a description of the way in which the land in this region has covered itself with forests, to the obliteration of the farms by which it once was occupied. Most of Mr. Nickerson's property, when it came into his hands, was a dense forest-growth, extending down to the water's edge, although here and there were open tracts still under cultivation. There was only one makeshift approach from the high-road to the house. Everything was to be done if a rough woodland was to be transformed into an agreeable summer residence. Fortunately, however, the man who had built the house had chosen exactly the best site, not on the actual point of the promontory, but on a broader projection toward the south-east, so that the view embraces the main expanse of Buzzard's Bay, and, as well, the long arm which runs up toward Wareham. And here he had set the house on exactly the right spot, just far enough away from the sea to leave wide foregrounds to east and south between house and water, and at the top of the slopes which thence run down to the narrow beaches. The house was left, outside, just as it stood, and now is manifestly out of keeping with its surroundings. But it is easier, one remembers, to rebuild a house than to recast an unfortunately treated landscape; and this landscape has been so well treated that, should an architect ever be called upon to rebuild, he will be very unintelligent if he fails to produce a wholly charming result.

The main approach to Great Hill is now from an entrance lying toward the north-west, on the road from Marion, and not far from the head of Wing's Cove, which, however, is hidden from view by the thick masses of the forest. Hence a finely constructed road, more than a mile and a quarter in length, leads to the house, gradually rising as it goes with perpetually varying curves, whose sinuosities, however, are never exaggerated, so that it seems to take the most natural way along the gentle ascent and between the closely pressing trees. The chief care bestowed upon the borders of the road was in the way of preservation; but along the edge of the macadam a border of turf, three or four inches wide, was laid. When I saw the road soon after its completion, five years ago, the artificial character of this little edging was apparent, but by the next summer it had become amalgamated with the natural growth of grass, wild flowers and shrubs. For a long distance after leaving the gate we drive in sun-streaked shadow beneath good-sized trees, chiefly White Pines, with occasionally a Pitch Pine, a Holly, a Swamp Maple, a Gray Birch, or a Cedar. In some places the undergrowth is low, giving a far view between the tree-trunks, but in others it forms masses of shrubbery from six to ten feet high, where Blueberries, Viburnums and Clethras, Wild Roses, Vines and young Sassafras-trees and Maples sweep the ground with their branches, while the finest feature of all is supplied by great full clumps of the shining evergreen Inkberry. Here and there these shrubberies fall back, leaving little grassy glades or vistas, with perhaps a big boulder or two, and sprinkled, now with red Lilies, and again with orange-colored Butterfly-weed or tall sprays of Golden-rod, Aster and Wild Sunflower. No one is allowed to break the shrubs or pick the flowers along the drives at Great Hill, wild though they are, and no one who sees their constant yet perpetually changing beauty thinks of wishing that a gardener had been allowed to "improve" them by any of his manipulations or additions. At one spot an unusually large White Pine accentuates a curve of the road; at another it is completely bridged, high overhead, by a slender drooping Birch, and at another a great old Cedar stands, almost dead but shrouded thick with hanging grief-moss—a figure of mortality which throws into strong relief the vigor of the life about it.

In one place the faintest glimmer of the waters of Wing's Cove may be caught through the trees. But the owner has had the right idea as regards the character of this drive, and has resisted many mistaken appeals to "open vistas" for the revelation of the sea. "This is a forest-road," he says; "you will see plenty of water when we get to it."

As one reaches higher ground, perhaps a third of a mile from the house, the soil becomes poorer, and bears chiefly smallish Oaks and Pitch Pines almost free from high undergrowth. Here on one side lies a large paddock for the horses and donkeys, and then at the end of a short straight stretch of rising road we come, facing eastward, suddenly out upon a very large, almost circular and sloping lawn with a wide stretch of blue water beyond it, and beyond this the low wooded line of the Wareham shore. Half-skirting the lawn to the right we are brought to the house; and from there, following the road as it passes between the lawn and another slope descending to the sea, it takes us out of the place again along a "sea-drive" about a mile in length.

It seems almost a pity that we had not approached the house by this second drive; for, although it is beautiful driving in either direction, it is, of course, most beautiful when our faces, not our backs, are turned to the south and the open bay. It runs close to the irregular margin of the water on one side, now skirting little white beaches and now border-like masses of low shrubs and clambering vines, from which rise occasional tall Pines or Cedars, while the forest on the landward side opens at intervals into broad grassy stretches, probably the remains of formerly cultivated fields. One of these wide pastures, almost square in shape, is especially beautiful, thickly surrounded by trees, but itself wholly unbroken save by a group of tall, graceful Birches that stands close to the roadway. Occasional pools of water also diversify this drive, as richly clothed along their edges as, I think, only the pools of this particular region ever are. Nothing but the road itself betrays the touch of art except one of these pools which, to protect the road, had to be kept within bounds by a stone curbing. Certain observers, struck by its unlikeness to its surroundings, ask why it was made of a regular oval shape and edged with symmetrically cut stone. But the owner replies that one can't make a curbed basin look really natural, and when a thing must look artificial it ought simply and plainly to confess its character. The result confirms his view, for one realizes that some necessity prescribed this treatment of the spring-hole, and, lying so close to the road, it does not strike an inharmonious note.

Marion, Mass. *M. G. Van Rensselaer.*

Seedling Almonds in California.

THE Almond groves are now one of the most charming features of many of the foot-hill districts of central California, and, when in bloom, are as fragrant and beautiful as the orange groves of the southern counties. Indeed, there is no more attractive time than the flowering time of the Almond for a visitor to go to the great centres of the fruit-industry. The Almond, it is true, comes first, and is followed in rapid succession by the Cherry, Peach and other fruit-trees. But the Almond is peculiarly fresh and lovely in its season; its petals fairly cover the grass, and are blown far across the highways in blush-tinted drifts.

One must get out of the fog belt to find the successful Almond-orchards. Niles, Livermore, Santa Clara, Los Gatos, Gilroy, to the east and south of San Francisco Bay; Sonoma, Santa Rosa, Suisun, to the north and north-east. The tree will grow almost anywhere, but it will not bear except in mild and sheltered situations. A few years ago ill-advised Almond-planting brought about a reaction, and numbers of orchards on poor soil, or too much exposed to sea-fogs and winds, were cut down for fire-wood. In the real Almond districts, however, no tree is more sure to pay well, one year with another.

California growers have originated many new and very desirable varieties of the Almond; with no other fruit or nut have the older varieties been so completely abandoned in new plantations. The Languedoc varieties, introduced into California as early as 1853, and later French importations, are now superseded by seedlings of local origin, some of them well worthy of trial by the great nurserymen of France, Spain, and Italy. Larger and better nuts, heavier crops and a greater degree of hardiness are the advantages of the California seedlings. Some of them yield nuts which bring, in the market, two or three cents a pound more than the standard imported varieties.

The leading grower of new kinds, A. T. Hatch, of Solano County, once exhibited 192 varieties of promise, four of which are now recognized as commercial sorts, and are being planted by tens of thousands all over the state. Professor E. J. Wickson, in his *California Fruits* (1889), mentions sixteen California

seedlings that are now standard varieties, and several more have come into prominence since.

It is interesting to note that, although California is now producing a great number of valuable new varieties of all the standard fruits, the Almond alone has so far improved that the older kinds are practically given up, and now can only be found in a few gardens. The same tendency is to be seen in the Peach, Apple, Pear, Apricot and Walnut, but in the case of these fruits many of the old standards still retain places in the front rank. Horticultural history must record the fact that California first originated an entirely new line of market varieties in the Almond.

The variety that I have chosen to illustrate (see page 499) is one of Lewellyn's seedlings, originating some years ago in Napa County, and considered by some growers the best bearing Almond known to orchardists. It is hardly in the general market yet, but all who have seen the orchard speak well of the variety, and it is being planted extensively. The branch from which the photograph was taken was smaller and somewhat less heavily loaded than many on the tree, and several almonds were broken from it before it reached the hands of the photographer. But it is a fair illustration of the vigor and fruitfulness of the whole race of California seedlings. It was cut from a five-year-old tree planted on a warm gravelly loam in Livermore Valley, and grown without the aid of irrigation. There was a fair crop in 1889, when the trees were four years from the bud; a large crop in 1890, the season when the photograph was taken, and a still larger crop is now ripening. Like the best of the California seedlings, it bears regularly every year.

Niles, Cal. *Charles Howard Shinn.*

A Clematis Borer (Acalthoë caudata).

A DESCRIPTION of this moth was first given by the late Dr. T. W. Harris, author of "Insects Injurious to Vegetation in Massachusetts." The original account of the moth, which he named *Ægeria caudata*, was given in *The American Journal of Science* (vol. xxxvi., 1839).

Without naming it, he refers to the insect in his volume on injurious insects, and again, in a letter to the late Dr. Le Baron, he speaks of taking a male specimen at Jackson, in the White Mountains of New Hampshire ("Correspondence," page 262). Dr. Harris has recorded that he found the eggs on Clematis, but no further account of the earlier stages is given nor of the injuries caused; and, although other authors have since written accounts of the Ægerians and have quoted Harris, nothing has been added to the facts given by him.

In the spring of 1890 it became necessary to move an old specimen plant of the Virgin's Bower (*Clematis Virginiana*) in the shrub collection of the Arboretum, and then it was found that the whole mass of roots at the crown and the bases of the stems had been bored and hollowed out by lepidopterous larvæ, a few of which were secured alive. These were kept, and on July 25th a female moth emerged, which proved these borers to be of the same species described by Harris. An examination of many other plants of the Virgin's Bower in the Arboretum and vicinity showed that almost every plant was more or less infested, a fact which fully accounted for a very apparent lack of vigor in this usually rampant-growing species. The borers attack the larger roots near the surface, infest the crown, and often enter into the larger stems, especially where these trail on the ground.

In June, larvæ of various sizes, from one-third to fully grown, may be found in the infested plants. The fully grown borer is about two-thirds of an inch in length and of a dull white color. The legs are brownish. On each side of the body there is a row of very minute brown dots placed singly on each segment, and a magnifying-glass shows several rows of solitary hairs along the body. The head is brown, and the top of the segment behind it is of a very light brown color, with two darker-colored club-shaped or spindle-shaped spots, the larger ends of which almost touch each other at the back of the segment, while the points are directed downward toward the sides of the head.

In the latter part of June or in July the fully grown larva makes a slight cocoon of silk, mixed with small particles of the wood or other material, and changes to a brown chrysalis, which is provided with a number of minute spines. These spines are largest on the last segments, and by their aid the chrysalis is enabled to force its way to the open air when the moth is about to emerge. Apparently the moths begin to emerge in the last days of July, and the eggs are deposited on Clematis soon afterward.

The male is remarkable for possessing a curious tail-like appendage, nearly, if not quite, as long as the abdomen. The general color of the insect is brown. In the male the fore wings are transparent from the base to the middle; hind wings transparent, but with a brownish fringe and subcostal spot. Antennæ, palpi, collar and tarsi tawny yellow; hind legs yellow, end of tibiæ and first tarsal-joints fringed with tawny yellow and black hairs. Tail slender, cylindrical, nearly as long as the body, tawny yellow, with a little black tuft on each side at base.

The female moth has the fore wings entirely black (opaque). The hind legs are black, with a rusty spot in the middle of the tibiæ, and fringed with black; and the caudal tuft is short, and such as is ordinarily seen in moths of this class. The female is larger than the male, and its wings expand from one to one and a quarter inches.

Besides Clematis, Dr. Harris gave our common wild Black Currant (*Ribes floridum*) as another food-plant, the larvæ living within the stems. Other writers have quoted this statement, but a careful examination of Currant-bushes growing among infested Clematis in the Arboretum failed to show any evidence of attack by the Clematis borer.

It has not been definitely ascertained how long a period is necessary for the larva to attain full growth, and no experiments have been made toward curing or preventing the attacks. Such treatment as is given in the case of the well-known Peach-tree borer would probably answer for this.

As yet no other species of Clematis except our Virgin's Bower has been found attacked at the Arboretum.

The accompanying figures are from drawings by Mr. C. E. Faxon.

Arnold Arboretum. *J. G. Jack.*

New or Little-known Plants.

New Orchids.

Pholidota repens, Rolfe, is a small species, with light flesh-colored flowers, sent to Kew by Mr. James O'Brien, in June, 1890, and again during the present year. It is a native of some of the hills of India. It is allied to *P. Griffithii*, Hook. f., of which it may be an unusually procumbent variety with differently colored flowers.—*Kew Bulletin*, 1891, p. 199.

Epidendrum Mooreanum, Rolfe, is a very pretty species belonging to the section *Encyclium*, and allied to *E. stellatum*, Lindl. The flowers are very fragrant, the sepals and petals light green, and the lip deep purple with light green margin. It is said to be a native of Costa Rica, and exists in several collections, having been sent to Kew for determination by Mr. F. W. Moore, of Glasnevin, Mr. W. Bull, Messrs. Hugh Low & Co., and Sir Trevor Lawrence. —*Kew Bulletin*, 1891, p. 199.

Polystachya bulbophylloides, Rolfe, is a minute and very anomalous species, with the habit precisely of Bulbophyllum. It is a native of west Africa, and was sent to Kew by Mr. J. O'Brien in July of the present year. The small diphyllous pseudo-bulbs are borne at intervals on slender creeping rhizomes. The flowers are white, except two orange spots on the lip and a purple margin to the column. The petals are reduced to a pair of minute fleshy tubercles, another anomalous character.—*Kew Bulletin*, 1891, p. 199.

Renanthera Ims-chootiana, Rolfe, is a handsome species allied to *R. coccinea*, Lour., and *R. Storiei*, Rchb. f., but with flowers in simple racemes and various structural differences. It was sent to Kew by M. A. Vanimschoot, of Ghent, Belgium, during July of the present year, with the information that it was received with *Ærides Godefroyæ*, Rchb. f., from Messrs. F. Sander & Co., of St. Albans, and is believed to be a native of the same country. The flowers are chiefly of a reddish vermilion shade.—*Kew Bulletin*, 1891, p. 200.

Pelexia olivacea, Rolfe, is a native of the Andes, sent to Kew by Messrs. Charlesworth, Shuttleworth & Co., of Heaton, Bradford, in April, 1890, where it flowered about a year later. It is one of those plants formerly referred to Neottia, though erroneously. The leaves are dull olive-green, with a broad, irregular, silvery band on either side of the midrib; the scape, ovary and sepals are also olive-green; the petals and lip white, with some yellow on the

mouth of the tube, formed by the union of the column with the stalk of the lip.—*Kew Bulletin*, 1891, p. 200.

Lælia grandis, var. tenebrosa, Hort.—This is a very distinct and handsome variety of *Lælia grandis*, which originally appeared with H. Tate, Esq., of Allerton Beeches, near Liverpool, in May, 1889, and appears to have been first introduced by Monsieur Travassos from a new district in Brazil. It has since flowered in several other collections. The segments are flatter than in the original form, less undulate, and of a decided copper-bronze tint, while the lip is purple, somewhat darker in the throat, and with a white margin. —*Gardeners' Chronicle*, August 1st, p. 126; *Lindenia*, t. 290.

Odontoglossum Hennisii, Rolfe.—A very elegant little Odontoglossum, sent to Messrs. Charlesworth, Shuttleworth & Co., of Heaton, Bradford, from Ecuador or Peru by their collector, Mr. W. Hennis, after whom it is named. In size and color it resembles *O. odoratum*, Lindl., but its real affinity is with *O. crinatum*, Rchb. f., which has a very similar lip. This organ is three-lobed, white marked with reddish brown, the side lobes rounded, the front one longer and acuminate, and the disk consisting of numerous hair-like filaments. The sepals and petals are yellow, barred with brown.—*Gardeners' Chronicle*, August 8th, p. 158.

Kew. *R. A. Rolfe.*

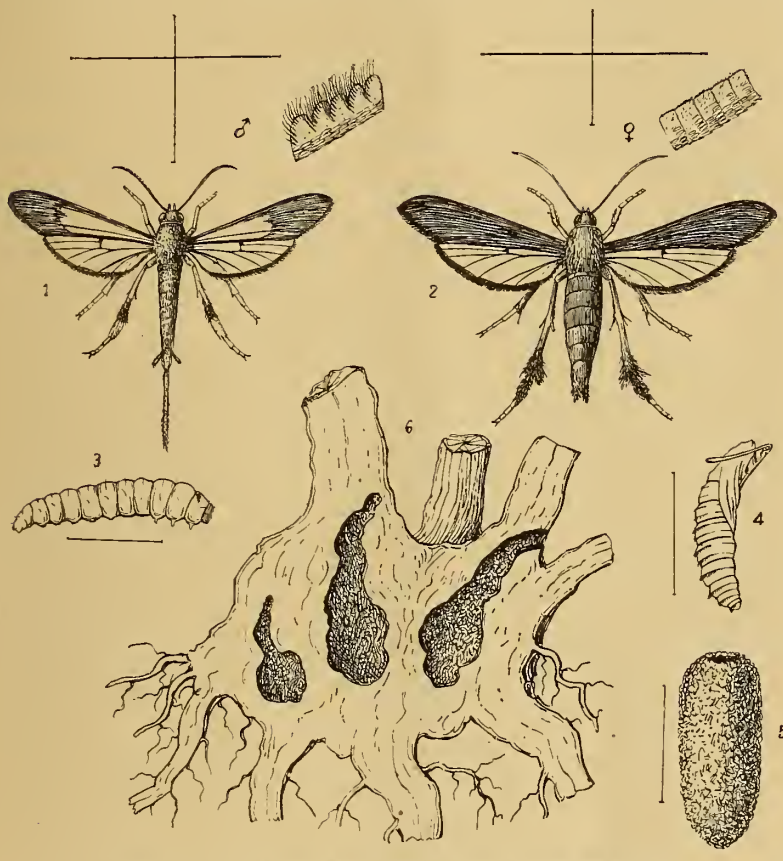

Fig. 77.—A Clematis Borer (*Acalthoë caudata*).—See page 496.

Figs. 1 and 2. Male and female, with highly magnified sections of their antennæ. 4. Pupa. 5. Cocoon. 6. Section of part of injured root.

Foreign Correspondence.

London Letter.

We have had more bright sunshine in England during September than in any month this year, which, so far, has been decidedly bad for horticulture. But sunshine came at last, and it has done a great deal of good. The garden now is beautiful with yellow Sunflowers of all kinds, purple Asters, tall fragrant Lilies and many-colored Dahlias. In some few places the pretty Crocuses proper, with their mimics, the Colchicums, make the lawns, rock-garden and lake-side gay with purple color. Even the Pelargoniums are bright with flowers, and the Roses were never better. September and October bring many rich color-effects both of flower, leaf and fruit in a well-made garden. I have often wondered that the really beautiful autumn-flowering species of Crocus have not yet been properly "discovered" and taken in hand by horticulturists generally. At Kew there are beds set apart for them, not much space certainly—in fact, only just sufficient for the plants to show what they could do if they were used for the production of effect in autumn as the spring-flowering species are used now. They may be had in small quantities from the bulb-growers, and propagated just as easily as the common garden kinds. Colchicums are quite as useful as the best of Crocuses. In England one may see meadows spread over with the rich purple of the native species, *C. autumnale*, the Meadow Saffron. It is also a favorite garden-plant with a few who can appreciate the beauty of our native plants when cultivated in the garden. The English Crocus (*C. nudiflorus*) is also abundant in fields and meadows, and is often mistaken for the Meadow Saffron from its flowering at the same time and growing in similar situations, as well as from the resemblance between the flowers of the two.

Among exotic species of both genera there are many that deserve a large place in every garden. Of Colchicums there are *C. speciosum*, from the Caucasus, with flowers as large as a wine-glass; *C. Parkinsoni*, with purple flowers conspicuously reticulated with a paler color, and *C. variegatum*, of the same peculiar character. But the king of these checkered flowered kinds is a new one—new to cultivation, that is, and named by Mr. Baker *C. Sibthorpii*. It was first described by Sibthorp in "Flora Græca" under the name of *C. latifolium*, but this name had previously been used for another species, hence the present name. For its introduction into gardens we have to thank Herr Max Leichtlin, who obtained it two years or so ago from Salonica. With his usual generosity he sent a few bulbs of it to Kew, where it is now beautifully in flower. In their handsome form, large size and lasting qualities the flowers resemble *C. speciosum*, but they are of the richest rosy mauve and prettily checkered like *C. variegatum*. I should say that in the whole range of hardy autumn-flowering bulbous plants we have nothing better than this Colchicum.

A list of all the hardy bulbous plants in flower here now would be longer than one would expect. Besides those above named there are the Belladonnas, some with their large blush-tinted trumpets in full blow, others only just pushing their purple noses through the soil. When they are all up there will be hundreds of them and all on a narrow border under a greenhouse wall, which is clothed with hardy Fuchsias, while the border is edged with the white Zephyr Flower (*Zephyranthes candida*). This is proving a better edge-plant than Box even; at any rate, it is growing amazingly well in a position which appears to have been too hot and dry for Box. The deep shining green of the short, graceful, rush-like foliage and the numerous white star-shaped flowers produce an effect of value in the garden. This effect, too, is permanent throughout the summer, and in winter the leaves remain green and fresh, frost having no effect upon them. The tall scapes of the white-flowered Watsonia, which Mr. O'Brien introduced from the Cape two or three years ago, are a new and pleasing feature among bulbs, for the scapes are four feet high, branched near the top and crowded with the whitest of white trumpets, which measure two inches across the mouth. Another charming Watsonia is a white-flowered *W. densiflora*. This species differs altogether from Mr. O'Brien's plant (*W. iridifolia*) in having an erect, unbranched scape, clothed near the top with brown scales, giving the flower-head an appearance exactly like a ripe

wheat-ear. Then the white flowers burst through the brown scales altogether, making the most delightful of white flower-wands. This is a new introduction from Natal and is now flowering for the first time in a bulb-border at Kew. *Tritonia rosea* and *T. crocata* are still in bloom, as also are the bright orange and crimson-flowered hybrid Tritonias raised by M. Lemoine. At Kew these plants are grown in very large round beds in conspicuous places on the lawns. Each bed is filled with one variety, and when the thousands of spikes are all in flower the effect is of the richest.

Lilies have not finished yet. Two very large beds of *L. lancifolium* (*speciosum*) are now at their best, better even than pot-grown specimens. A few years ago no one would have ventured to grow this species for open-air effect and left the bulbs to take care of themselves after they were planted. *L. auratum* is as grand as ever. The new *L. Henryi* is not yet over, but keeps step with its near affinity, *L. lancifolium*. The rich crimson spikes of the Schizostylis have begun to unfold and will continue until severe frost cuts them down. In the greenhouses the huge trumpets of *L. Wallichianum*, *L. Neilgherrense* and the richly colored *L. Nepalense* are now at their best. The two last-named are not very easy to manage in England, but *L. Wallichianum* is apparently as good-natured under artificial treatment as *L. Harrisii*. A new addition to Himalayan Liliums has been discovered by Mr. Boxall, Messrs. Low & Co.'s collector, and has been named in compliment to him by Mr. Baker. It is like *L. Nepalense* in habit and appearance and may be called a pale, uniform, yellow-flowered form of that species. Bulbous plants are the worst of all when they do not get what they want, but no plants are more interesting or more delightful to look at than they are when at their best.

Dahlias.—These are general favorites in England now, and at all the exhibitions in autumn they form a very conspicuous feature. The Cactus section is, perhaps, the most popular, although the single flowered kinds are thought by many to be the prettiest and most useful. Messrs. Cannell, Phippen, Paul, Ware, Turner, in fact, all the nurserymen who grow herbaceous plants for sale, have contributed many new kinds within the last year or two. In form there is nothing different from the Show, Pompons, Cactus and single flowered kinds, but in shades of color great progress has been made. Brown and black are scarcely flower-colors, but in Mr. Cannell's new varieties of the single flowered these colors are represented in various shades. Single Dahlias are easily raised from seeds, so easily, indeed, that in countries where they are not destroyed by frost they have run wild. I am told by Dr. King, of Calcutta, that in the Himalayas the river-banks are in many places clothed with Single Dahlias which have escaped from cultivation and established themselves over miles of country by means of seeds. At this rate it is possible that the Dahlia may become a scourge in the subtropical regions of the east. At a meeting of the National Chrysanthemum Society at the Royal Aquarium there were no less than one hundred new kinds of Dahlia submitted to the committee for certificates. Of these the following obtained awards: Show—George Gordon, John Rawlings, Indian Chief, Arthur Rawlings, Scarlet Queen. Cactus—St. Catherine, Beauty of Arundel, Baron Schrœder, Duke of Clarence, Rayon d'Or, Mrs. Keith. Fancy and Pompon—Touchstone, Lilian. Single—Miss Glasscock, Evelyn, Little Snow White. The Royal Horticultural Society certificated the following: Cactus—Sir Roger, E. Cannell, Mrs. Thornton. Pompon—Mars, Lorna Doone, Little Sarah, Mrs. Besant, Nellie Nachray. Show—Ada Rehan, Mrs. Ocock, Mrs. Humphries.

Begonias.—The tuberous-rooted kinds, now properly known as bedding Begonias, have reached as high a place in horticulture as the scarlet Pelargoniums. Every garden here of any pretensions employs these Begonias extensively in summer-bedding. In the conservatory the most select of named sorts are a conspicuous feature. Some are remarkable for size of bloom, flowers almost large enough to overlap a man's hand being among them; others are as large and double as Hollyhocks; others, again, are of some special shade of color. As pot-plants we have nothing better, because nothing is more easily cultivated or produces a better effect when in flower. And this is quite true of the tuberous Begonias as bedding plants. The excessive wet of the summer, now almost ended here, has not disagreed with these Begonias. In the parks, at Kew, in large private gardens near London, they have been and are still a chief attraction. The great demand for them is indicated by the acres of them grown by those nurserymen who make Begonias a specialty. Messrs. J. Laing & Sons appear to have millions of them in their large Begonia-fields. Mr. T. Ware has almost as many. So, too, has Mr. Cannell. In the fields the plants are as large and healthy and the flowers as perfect as in the carefully cultivated flower-bed. Ask these nurserymen if they can find a market for so many plants, and the answer is to the effect that they haven't half enough. In England the taste for summer-bedding is in the direction of simple masses of one color, and the many-hued beds, like Joseph's coat, will soon be things of the past. Of course, the king of summer-bedders, the Scarlet Geranium, will always be of first-rate value where color is wanted. These tuberous Begonias will also be exceptionally useful for the same purpose. They require a little management at the beginning, but their wants are simple and soon mastered.

Gathering Storing Fruit.—Mr. Joseph Cheal, an eminent fruit nurseryman in Sussex, and one of the organizers of the British Fruit-growers Association, read a paper upon this subject at a conference of fruit-growers held in Edinburgh a few days ago. Mr. Cheal's knowledge and experience are such as enable him to speak with authority upon such important matters as the care of fruit after it is ready for gathering. He recommends the use of ladders that will stand alone, hand-picking, and baskets instead of sacks. Many apples, he says, should be gathered a few days before they are ripe, and at once placed in boxes or sieves to travel. For the bulk of fruit it is best to allow them to remain on the trees until they are ripe, as when gathered too early they shrink, the rind shrivels and the fruit looks leathery. All fruit should be sorted and graded if intended for market. No two kinds should ever be placed in the same basket. Small baskets of neatly packed fruits of high quality will fetch a much higher price than if placed roughly in the ordinary basket. A novel fruit-store recommended by Mr. Cheal is "a cave in a chalk-bank or sand-hill, which makes a capital apple-store when fitted with wooden shelves." Ventilation, an equable temperature, and the exclusion of frost, are essentials in a good store-room for fruit. A simple store, which answers well, according to Mr. Cheal, is made by throwing up two banks of soil and placing a thickly thatched roof across them. Pears require a warm dry store-room, differing from apples in this respect. The cool and somewhat moist atmosphere required by apples takes all the flavor out of pears. For pears hot-water pipes may be used with advantage, but not for apples.

Kew. *W. Watson.*

Cultural Department.

Copper Salts and Vegetation.

THE solutions of copper are efficient fungicides. The various micro-organisms—mildews, blights and rots—infesting plants of a higher order are killed by contact of these solutions, and germination of their spores is prevented. It is believed that these uses of copper will be of untold value to agriculture. No doubt of this, provided the copper is destructive only to these lower plants, the fungi, and that it is not harmful to the vitality of our cultivated plants.

But these copper salts, sprayed on vegetation, are finally deposited on and in the soil beneath, and they may there be inimical to the germination of our planted seeds and to the prosperity of plants which spring from them. These are grave possibilities, made seriously plausible by experiences had in my recent practice. When under the direction of the United

States Department of Agriculture I began experiments with the copper compounds, I naturally did not confine the treatment to the Vine exclusively. With the view of preventing Corn ergot (*Ustilago Maydis*) I soaked for four hours a portion of my seed-corn in the Bordeaux mixture, and then planted it in a plat in the field by the side of other plats seeded with corn not thus treated, and in comparison with a plat planted with corn-seed soaked for eight hours in a solution of copperas (sulphate of iron). On the plat treated with Bordeaux mixture, the seed generally failed to germinate; on the other plats, the seed grew in usual health.

The next year I made the experiment of spraying sundry plats of Peachblow Potatoes, to prevent blight and rot. This was successful, as reported in one of the department bulletins. The sprayed plats gave a good crop; the unsprayed plats were all the victims of the fungus (*Phytopthora infestans*), dead

Fig. 78.—A Seedling California Almond.—See page 495.

and dried up six weeks before the others, and giving practically no crop. This potato-patch was subsequently planted again to Peachblows. When the tubers sprouted I saw that growth on the plat which had not been sprayed was earlier and more vigorous than on the plats which were sprayed the previous season.

The next year this patch was again planted to Peachblows. On three rows I sprayed the tubers, after they were dropped along the furrow, with Bordeaux mixture, expending about the same quantity of the liquid as would be used in one spraying of a row of Grape-vines. These sprayed tubers generally failed to sprout. Nothing from them was visible above ground for two weeks after those in the other plats were up, and at last more than half of the sprayed tubers never sprouted, rotting in the ground.

In the spring of 1891 I again planted this Potato-patch to Peachblows. On the plat where the tubers had formerly been sprayed along the furrow, but not thus sprayed this year, fully seventy-five per cent. of the Potatoes failed to grow, and those which finally did come up showed a weak and spindling growth, and yielded very few potatoes. The other plats did fairly well, excepting that the plat which has never been subjected to the copper-spraying showed the best growth of plants. These, however, succumbed to the blight, as I have continuously left this plat untreated. The Potato-plant may be completely protected from this rot fungus by persistent spraying with the Bordeaux mixture, but there is ground for fears that present benefits may be followed by a future injury, and that soils once largely contaminated by the copper salts may be thus rendered bad for the growth of plants.

I shall renew this Potato experiment another season, but I fear that similar results will be manifest. It will be a serious matter if we find that in our zeal to save the health of our plants by these copper applications we risk the permanent ruin of our soil.

When planting my hot-bed with Sweet Potatoes, this spring, I sprayed the tubers, when laid in one section of the bed, liberally with the Bordeaux mixture. None of the tubers thus sprayed sprouted; all rotted. I removed these spoiled tubers, and, without changing the soil in this section of the bed, replanted it with sound and growing tubers, the sprouts on which were half an inch long. Many of these tubers did not send a sprout above ground, but they perished as did the ones formerly planted. I did not obtain any good plants from this sprayed section of the hot-bed.

I shall leave the soil in this bed exposed during winter, and purpose next spring to save the soil of the sprayed section and replant it with Sweet Potatoes, in order to learn if the contamination of the copper remains in the upper stratum, or if it is washed downward so deeply as not to be harmful to the growth of the plants. These analyses of the soil by vegetation are more searching and more practical than those made by the chemist can be.

My Experiment Vineyard, which has been annually subjected to treatment by the copper solutions ever since 1887, affords a good field for investigation. I purpose to examine chemically the soil of this vineyard, in successive strata, to the depth of, say, two feet, to find where the copper is. On this Experiment Vineyard I do not, as yet, see any defect in the growth of the vines. All are thrifty and are peculiarly healthy. My sprayed vines are covered with green foliage and have plenty of well-ripened canes, while a neighboring vineyard, not ten feet distant from mine, has been bare of leaves for the past two weeks, with its canes but poorly ripened. On my vineyard this year I saved the entire crop by spraying with the Bordeaux mixture. The neighboring vineyard, of the same variety of grapes, lost its entire crop by the black rot. So far as the Vine is concerned its testimony is decidedly in favor of the use of the copper remedies. Yet, other plants in this vineyard—weeds and grasses—tell plainly that something in the soil is hostile to their health. The surface-growths in my Experiment Vineyard, which has been longest sprayed with the copper mixtures, contrast in a striking way with those of vineyards untreated. Among untreated Vines the weeds and grasses are knee-deep. In the sprayed vineyard the soil is nearly bare of this sort of vegetation.

These observations suggest that it may be well to be parsimonious in the use of copper solutions on our soils. How they may affect the root-system of the Vine we, as yet, do not know; but for other vegetations it will possibly prove dangerous. At any rate, until we know more on this subject, it will be more safe to economize in the application of copper.

When we first learned of these mixtures from France it was stated that the simple solution of copper sulphate—one pound of the sulphate to twenty-two gallons of water—is effective in preventing diseases of the Vine. We found that this "simple solution" harmed the foliage of the Vine. We then substituted the Bordeaux mixture, six pounds of copper sulphate, four pounds of fresh lime (to neutralize the acid of the sulphate), and twenty-two gallons of water. French professors at Montpelier now advise the use of twice as much sulphate in the mixture. Now, if the "simple solution" of copper be fatal to the fungus, why is the Bordeaux mixture better, with its six times as much copper salts and lime, to neutralize its effect on foliage? My experiments with the copper sulphates have shown that it is the copper only which is the fungicide. Hence, why may not only one pound of it be effective, if it be neutralized in acid by an alkali?

The experiments in prevention of plant-diseases are, as yet, but crude. Many tests must be made before our agricultural pathologists can speak with certainty on many vital points. The fact is fixed, that the copper mixtures are reliable fungicides. We must now further find how to use them safely—that is, without harm to vegetation.

The suspicion of injury to man when he partakes of fruits sprayed with the copper solutions has been suggested by some city boards of health. But this is preposterous.

Vineland, N. J. *A. W. Pearson.*

Work of the Season.

THE preparation of various plants and bulbs for winter-flowering will occupy a prominent place in the routine work of the present time. The more tender subjects, such as Bouvardias, Stevias, Callas, etc., will be safely housed before this date, for to leave them out after October 1st in this latitude is only to invite injury. *Lilium Harrisii*, for early flowering, should have been potted some weeks ago, but if needed for Easter only, there is still time. For the latter purpose *L. longiflorum* is decidedly better, making a much handsomer pot-plant than the Bermuda Lily.

As a potting material for these Lilies there is nothing better than light loam well enriched with good manure, and they do the best when originally set into the pots where they are to bloom. It is bad practice to disturb the roots of a Lily by a shift after the plant has started. In order to secure a good root-growth before the top makes much headway, these Lilies should be placed in a cold frame until sharp frosts are apprehended, when, of course, they must be brought into more protected quarters; and I have secured the strongest growth by covering the frame with slightly shaded sashes instead of covering the pots with a mulching. Free ventilation is needed, both night and day, so long as the weather will permit.

Lily-of-the-Valley crowns, or pips, will also need to be cared for now. It is best to pot the crowns as soon as they arrive, and then store them out-doors until needed. The separate pips may be treated in the same manner, or may be heeled-in in a frame in the original bundles.

Tulips, Hyacinths and Narcissus should also be potted as received and well covered in cold frames, in order to induce a strong growth. From here they may be brought into heat in successive lots as required. Cannas should be lifted as soon as the foliage is injured by frost and may be stored in almost any moderately warm and dry place for the winter. It will be found a good plan to lift a few clumps of the best dwarf varieties before frost and put them in tubs or boxes for conservatory decoration, and also to furnish flowers for cutting during the winter. The handsome foliage and bright flowers of some of these Cannas are very effective when used in large vases.

Carnations recently lifted should be staked and tied as soon as possible, to prevent the flower-shoots from falling about, and if the plants are set out on a bench, the neatest method of staking is by means of wires placed in the same way as would be done for a bench of Roses. But, whatever method is adopted, some care should be given to the tying of Carnations, for, when bunched up too tightly, the foliage in the centre of the plant soon decays from lack of light and air, and not only the appearance, but also the health of the plants is ruined.

Cyclamens will soon be showing flower—in fact, many will do so before this—and among the most necessary precautions for their welfare are free ventilation and plenty of light. It should also be remembered that shapely, sturdy plants cannot be developed unless they are allowed abundant room.

To encourage the bracts of Poinsettias a stimulant in the form of liquid manure should be given about once a week. Pure guano is probably the most effective for this purpose, but it should at all times be used with caution, for an overdose will do considerable injury.

Holmesburg, Pa. *W. H. Taplin.*

Chrysanthemums.

IN the gardens of the amateur growers of Chrysanthemums at this time one observes a great difference in the forwardness of the buds in the various collections—a difference, apparently, in extreme cases, of a week. This is not peculiar to this season, but it may be observed any year. On a comparison of notes the owner of the backward blooms seems to have cultivated his plants judiciously and given them every requisite attention, and it is sometimes rather difficult to account for the slowness of development. It will generally be found, however, that either over-nourishment of the wood, resulting in gross sappy growth, which matures slowly, or else a rather shady position, and, perhaps, a too close tying together of branches has interfered with the ripening of the wood. Perhaps, also, as the season progresses toward the middle of August, the time when the buds may be expected to appear, the owner, a little over-solicitous, has given them liberal supplies of water and manure and kept them moving, whereas, were the plants kept rather dry till the buds appear and then given the proper amount of manure, the buds will quickly show the benefit of the treatment. These notes refer to plants in the open ground, which, in some respects, require different treatment from those in pots. There seems to be a general impression that these plants require great supplies of water, whereas, in the open, few plants are more easily injured by an over-supply. I should say that they require much less water than Roses to keep them in good condition. It has been often observed that vegetative vigor and sexual vigor are not synonymous, and this is true of no plant more than of the Chrysanthemum. A large grossly grown plant is usually a disappointment if good flowers are expected. A judiciously grown plant, with fine-grained wood, will always produce the best flowers.

Now that the October days have come, with keen frosty air, one turns to the Chrysanthemums with something more than cultural interest; a few forerunners there are in bloom, but these are only plain sisters of the splendid array which will flaunt their beauties in early November. The Chrysanthemum grower finds his present excitement in watching the gradual development of the fat buds which, with many changes, will perhaps expand into the longed-for perfect bouncing flowers. If, at the same time, like many amateurs, he flowers his plants in the open air, with temporary protection, he will find plenty of other excitement in guarding his treasures from hard frosts and high winds, which never seem to blow quite so hard as when one has a tent, or some such contrivance, which is a tempting plaything for a robust and festive gale.

Elizabeth, N. J. *J. N. Gerard.*

The Hardy Plant Garden.

QUITE a number of perfectly hardy bulbs succeed best when planted in fall and allowed to remain in the soil all winter. Although not a bulb, strictly speaking, the Lily-of-the-Valley usually should be planted as soon as it is received. There are many gardens that have a shady corner where this plant would be perfectly happy for generations, in places where it is difficult to get grass to thrive, as, for example, under trees and near shrubs that have become bare at the base. All that is necessary in planting is to cover the crowns, or "pips," about three inches deep and mulch annually with well-decayed manure to insure an abundance of these lovely flowers. Another plant, not bulbous, which should be planted now is *Mertensia Virginica*, the "Virginian Cowslip." No garden is complete without this early spring flower, which is far more sought after in England than here. The Mertensia has large fleshy root-stocks that send up shoots in early spring, and these bear flowers of the most intense blue, which last a long time in perfection even when cut. It is at its best here the first week in May. The Dodecatheons, also, should be planted now, as they flower early too, and if they do not flower the first season mark the spot where they are in June when they die down, and another year, when stronger, their pretty Cyclamen-like flowers may be enjoyed. There are several varieties of Dodecatheon, and all are pretty, though there are some forms sold as *D. Meadia*, that have a poor washed-out pink color, which may be improved by the addition of burnt earth or refuse. Collectors tell us that where prairie-fires pass over a locality the Dodecatheon-flowers are always of a much deeper color. If this is so, we have a very simple way of improving a pretty garden-plant.

If every one had courage to chronicle his failures as well as the successes the world would be much wiser to-day. Certain it is that the beautiful Anemones that thrive so well in Britain cannot be made to feel happy here, and after trying various methods we have now transplanted what are left of them to a cold frame, where they may flower in spring. We hope they will, as they are beautiful when cut and last a long time, but it is not wise to speak of them as hardy. I am inclined to think that *Anemone fulgens* is much more hardy than the varieties of *A. coronaria*. We planted them out once in a cold frame and merely protected them with a sash, simply to keep off the rain and snow, and they did better than any I have ever grown in pots. It is very difficult to procure a good strain of *A. fulgens* now; nearly one-half of them are apt to turn out mere abortions, the flowers being a mixture of green and scarlet shred-like petals. There is a form in cultivation known as Græca, which is the best of all, with broad Tulip-like petals. In districts south of Washington *A. fulgens* would be perfectly hardy and a beautiful border-flower when planted in light rich soil.

Calochortus, again, cannot be considered hardy. We tested them several ways last winter, but our only success was with those in cold frames planted in pans. These flowered beautifully in spring, and were very pretty when cut. In the garden now we have *Colchicum autumnale* in flower, a singular plant, which attracts attention always. Colchicums should be procured early, as the flowers often develop before their arrival here from Holland. In any case much must not be expected the first season, but in spring a good growth of foliage may be looked for, and in fall they will flower abundantly. They are often called autumn Crocuses. The winter Aconite is one of the earliest heralds of spring, with yellow flowers borne on a fringe of foliage just above the ground. A clump of this is gladdening to the eye, as the bright flowers open as soon as frost loosens its hold. Botanically the plant is *Eranthis hyemalis*.

Chionodoxa scarcely needs an introduction, so much has been said of it, but it has never yet been over-praised. The bulbs are small, but even if planted a foot deep they will come up and flower just as early. None except those who have tried know how difficult a bulb this is to attempt to dig in quantity; one is sure to leave as many behind as are taken up. The Chionodoxa is charming in any situation for early spring display, and with it comes the deeper blue Siberian Squill. These are both cheap, perfectly hardy, and should be planted about six inches deep. *Iris reticulata*, one of the bulbous Irises that flower early, is not difficult to keep, and is almost as fragrant as a Violet. A little breadth of this Iris is very pretty in early spring, as the flowers open with the Snowdrops. The best Snowdrop is *Galanthus Elwesii*. This seems to do better year after year than *G. nivalis*, the older kind, and flowers much earlier also. But of the time of flowering for spring bulbs very little can be said, as so much depends upon the weather.

South Lancaster, Mass. *E. O. Orpet.*

Anemone Japonica.—The Japanese Wind-flower, as this plant is commonly termed, is perhaps the best of our hardy Anemones, and undoubtedly the best late-flowering perennial known in New England gardens. The flowering season begins early in September, and continues in great brilliancy until frost. The large, dark green, ternate leaves are borne on stout petioles upward of a foot in length. The blade portion of the leaf in its entirety is of cordate outline, and the oblique lateral divisions and ovate central segment have also the cordate character, and are toothed and irregularly lobed. The stems, ascending boldly erect from the thick foliage to a height of from three to four feet, are branched toward the summit, and bear a profusion of spreading rose-purple flowers three and a half inches in diameter. The segments of the outer circle, where sepals are scarcely distinguishable from petals, are very numerous and of oblong form. The bright green, globular, pistillate mass in the centre, surrounded by a broad ray of showy yellow stamens, greatly enhances the beauty of the flower.

There are two quite distinct varieties of *A. Japonica*. The first, *A. Japonica*, var. *alba*, also known as Honorine Joubert, is by far the most popular, and decidedly the best of the three. The flowers of this variety are a trifle smaller than those of the species, and the elliptical or obovate parts of the pure white perianth rarely number more than nine, or about one-third of the number observed in the original form. *A. Japonica*, var. *rosea*, resembles the white-flowered variety in all particulars save the color of its flowers, which are of a delicate rose tint. These varieties are said not to be of seedling origin, but to have been obtained by means of root-sports.

A. Japonica is a native of China and Japan, and the inhabitants of those countries, where it is carefully grown, have long

appreciated its charms. It was introduced to Europe in 1844. The cultivation of the species and its varieties is not difficult. The plants make their best growth, and, consequently, flower most freely, on a moderately dry site which affords a slight measure of shade. A somewhat sandy loam, well enriched with leaf-mold, forms an excellent compost. Massing is the most effective method of planting, and great care should be exercised in the selection of the position for such masses, so that removal of the plants may not soon become a necessity. Disturbance of the roots is almost invariably resented by healthy plants, hence the desirability of using proper judgment in planting. A light annual top-dressing of thoroughly decomposed leaf-mold early in spring will preserve the needed fertility. Propagation may be effected by carefully dividing the roots in spring.

Cambridge, Mass. *M. Barker.*

Musa Ensete.—In a recess here, sheltered from the northwest winds, there stands, untouched by frost in mid-October, a noble group of the Abyssinian Banana. They are now six years old and have been planted in this corner for the last four years, but, as yet, have not fruited. Every autumn, when cut down by frost, they are dug up and stored in sand, free from frost, until some time in January, when, after repotting, they make new roots and a few leaves, and, although much reduced in size, they are in good condition for planting out in June. The set-back received during winter doubtless prevents their fruiting during the succeeding summer, and it is fortunate it is so, since fruiting in this species means death. Many plants of this species have been lost during winter through over-watering. They need very little. An acquaintance of mine threw a small plant into the loft, above a workshop, which was always free from frost. It kept alive all winter and grew well the following season, with nothing about its roots but a piece of bagging.

Wellesley, Mass. *T. D. Hatfield.*

Correspondence.

The Province Lands at Provincetown.

To the Editor of Garden and Forest:

Sir,—During my recent search for public holdings in the shore-towns of Massachusetts, for the Trustees of Public Reservations, I examined the province lands at Provincetown, and traced the course of legislation regarding the title to them. They are undoubtedly the property of the commonwealth, and thus constitute an important and extensive public reservation already in existence. It comprises all that part of Provincetown lying west of the westerly fence of the eastern schoolhouse, and extends southerly from the said fence about eighteen degrees east to the harbor, and from the said fence northerly about eighteen degrees west to the ocean. A large part of the village of Provincetown stands on this land, and besides the tract thus built upon there is an unoccupied area which the town officers estimate at 4,000 acres.

At a very early period in the history of the colony these lands were, by specific action of the Government, reserved as a colonial fishing-ground, and from it the colony obtained a varying revenue. At a later date this territory was set apart as a fishing-right to be held in common by the people of the province. The records of the colony show that it was enacted by the court in 1661 that no stranger or foreigner shall improve—that is, use—our lands or woods at the cape for the making of fish without liberty from the Government, and that all who obtain the privilege shall obey orders and pay sixpence a quintal for the colony's use for all the fish they catch. In 1670 the colonists were required to pay sixpence a barrel for mackerel caught at Cape Cod, and foreigners one shilling and sixpence. After this there is a long succession of grants and regulations for this fishing-ground, which constantly assert the title of the colony to these lands. Some of these grants were made to support schools, some for bounties for soldiers or their widows. In 1690 the court specifically asserts its possession of all the soil and royalties at Cape Cod.

In 1736 three men, as agents for the inhabitants of the Precinct of Cape Cod, presented a petition to the court asking that the precinct be made a town, and the court granted the request, with this condition, "Provided it do not prejudice the right and title of the province to the lands nor obstruct any person in the fishery, which is a privilege in common." The precinct was made a town in 1727, and called Provincetown, and in the act of incorporation the term "province lands" is first used officially. This is the act:

"Be it enacted, etc., That all the lands on said cape—being province lands—be and hereby are constituted a township by the name of Provincetown, and that the inhabitants thereof be invested with the powers, privileges and immunities that any of the inhabitants of any of the towns within the province by law are or ought to be invested with; saving always the right of this province to said land, which is to be in no wise prejudiced. And provided that no person or persons be hindered or obstructed in building such wharves, stages, work-houses and flakes and other things as shall be necessary for the salting, keeping and packing their fish, or in cutting down and taking such trees and other materials growing on said province lands as shall be needful for that purpose, or in any sort of fishing, whaling, or getting of bait at the said cape, but that the same be held as common, as heretofore, with all the privileges thereunto in any wise belonging."

From 1727 to 1854 there is, so far as I can ascertain, no record or indication of any abandonment or modification of the title of the province or commonwealth to these lands, and in 1854 the legislature enacted that

"The title of the commonwealth, as owner in fee to all the province land within the town of Provincetown, is hereby assorted and declared, and no adverse possession or occupation thereof by any individual, company or corporation for any period of time shall be sufficient to defeat or divert the title of the commonwealth thereto."

"The provisions of the 12th section of the Revised Statutes, chapter 119, shall not be held to apply to any of the province lands in said town of Provincetown."

These paragraphs are sections 8 and 9, chapter 261, of the Laws of 1854. The 12th section of chapter 119, here referred to, provides for the acquisition of title to land by undisputed possession or occupation for a prescribed term of years, and these province lands are expressly excepted from its application.

The people living on these lands are merely occupants and holders. They buy and sell the land, and give, receive and record warranty-deeds, but these, though they may be good as against the claims of individuals, are of no force or validity against the right and possession of the commonwealth, which holds by an absolute title, indefeasible by adverse possession or occupancy by any individual, company or corporation for any period of time.

There is no reason to suppose that the state will ever disturb or eject these occupants of the lands belonging to the commonwealth. Nobody, so far as I know, is in favor of any interference with the occupancy of those who have been permitted to appropriate portions of these common lands to their individual use; but a large number of the inhabitants of the town of Provincetown are dwellers on the public domain, and have no title in fee to the land which they occupy.

The most important feature of the matter is the fact that, besides the territory thus used and dwelt upon, there remains an area entirely unoccupied which is estimated at about 4,000 acres, or six square miles. This region embraces and constitutes the extreme end of Cape Cod. About half of the tract is fairly well wooded, being covered by a thick growth of "hard Pine" (*Pinus rigida*), Oak, Maple and other trees, with a dense undergrowth of shrubs and vines. This wooded portion lies nearest the village of Provincetown, and probably contains about 2,000 acres. The part nearest the shore, constituting the point of the cape, appears to be of nearly equal area. It is a region of moving sand, which is blown by the wind into great billows, or irregular ridges, which are every year rolled farther and farther inland toward the village, swallowing and burying the forest as they advance.

I saw Maple-trees more than twenty feet in height which are entirely covered as they stand, except a few sprouts from the highest branches, by which the tree is struggling to raise its lungs above the suffocating sand. It is a painful spectacle to a lover of trees. The whole of this area of 2,000 acres of unstable sand was covered by a Pine-forest when white men first came to the cape. This desert is not natural, but was directly created by human agency. The trees were cut away, and much of the space—perhaps all of it—burned over, thus destroying the soil and the mat of vegetable fibres which held it in place. All the conditions which maintained the stability of the surface being destroyed, the sand of the shore began to move inland before the wind, and it has continued to advance with increasing depth, volume and velocity until now. The stumps of Pine-trees are still visible where the wind blows the sand away down to the original surface.

Much money has been expended in efforts to stay the progress of this ruinous and resistless tide of sand, but nothing has been accomplished except to demonstrate the futility of the methods employed. The planting of beach-grass has been the means chiefly, or wholly, relied upon to bind the shifting

and flowing surface; but it is almost entirely ineffective, owing to the depth and mobility of the sand and the great force of the wind. A ridge or plateau of sand, from ten to twenty feet in depth and several acres in extent, is sometimes removed in a few hours.

I think the whole of the desert area might be reclaimed and rendered stable and productive, and the wooded region defended from further injury; but no effort for these ends can be successful unless the means used are adapted to the essential conditions and requirements of the problem. These have been entirely disregarded hitherto. The work of restoration must, of necessity, begin at the edge of the water, at the place where the wind which moves the sand first exerts its force.

A temporary barrier or wind-break, extending a considerable distance along the shore, would be required. A hedge or wall, formed of several rows of closely planted Cedar-saplings, or something of a similar character, would afford the protection needed, and under the shelter of this hedge could be planted such cuttings and young trees as are thought best adapted to growth in such conditions, some species of Willow and of Poplar, the Pitch Pine and other suitable trees. One species of Poplar grows rapidly and becomes very large along the streets of Provincetown, where it is absurdly called the "Silver Oak."

The hedge of Cedar-saplings would not be planted to grow, but it would last a long while, would catch most of the sand that might be raised by the wind between the hedge and the sea, and would afford shelter for the growth of the cuttings and young trees planted at its foot on the landward side.

Only a narrow strip could be thus defended at first, and, therefore, only a narrow strip could be planted at once with any possibility of success. The planting of a broad area at the beginning of the undertaking would be entirely unscientific and impracticable. After the young trees of the first narrow strip of plantation along the shore have begun to grow, another narrow belt, on the landward side of the first, can be planted, but the requisite shelter for later strips or belts of planting can be supplied only by the growth of the first belt. The essential requirements for the enterprise would be a small beginning, careful attention to details, unremitting watchfulness and fostering of the young plants and the extension of the plantations by successive narrow belts. After a beginning is successfully made, short lateral spurs could probably be extended from the base line of the planting at frequent intervals and at various angles. Much time would be indispensable, and great patience and faithful industry.

This state reservation is under the care of a state agent who is appointed by the governor and council. He is by law empowered to give permits for the cutting of timber and of sods on the state lands. The sods are not of grass, but of the roots of the bushes and shrubs growing on the land, and when these sods are removed all the soil is taken up with them, down to the inert sand, which is then blown away by the wind, thus adding to the area of desert. The sods are much desired and much used by the people of the village for "bulk-heads," terraces, banks, walls and many similar constructions. It is almost the only building material available for the people of the village without cost, but it does not belong to them. It is the property of the state and ought to be protected from spoliation. The removal of the soil is robbery of the most fatal kind.

The state agent is not, in any considerable degree, efficient. He appears to be extremely honest and conscientious in wishing to avoid expense to the state in the administration of his office. He grants very few permits. The fee for each permit is one dollar. All fees are turned over to the public treasury, and the agent is allowed three dollars a day for time actually employed in the duties of his office. He told me that, to save expense to the state, he seldom visits the reservation. I think that, as a matter of fact, he gives it no considerable attention, and scarcely ever sees much of its area. As a consequence, people do not take the trouble to apply for permits to cut wood or sods, but take what they want without permission. The reserve is despoiled of both wood and sods without scruple. Many of the Portuguese laborers in the town obtain fuel for domestic uses from the state lands, carrying home the wood on their backs after the regular labor of the day is over; but the native Yankees also contribute their full share to the spoliation.

The proximity of thousands of acres of wooded land, without apparent ownership or efficient supervision, is a perpetual provocation and inducement to theft, and it would have a similar effect anywhere. I have repeatedly observed about the same state of things on Indian reservations in Dakota and Idaho, and on the public domain in the Coast-range region. While this Massachusetts reservation remains unguarded and uncared for it must continue to exert a demoralizing influence upon the adjacent community.

I think the law relating to the administration of the reserve should be so changed that no cutting of timber for use outside of the limits of the reservation shall be authorized or permitted, and the removal of sods and soil should be entirely prohibited.

The town officers of Provincetown and other leading citizens would be glad to see an efficient supervision of the province lands established and maintained by the state. There is much talk of various schemes of real-estate men for the use and improvement of this state property as a means of attracting summer visitors and revenue to the village, but the first thing for the people of the state to consider is the need of proper care for the property of the commonwealth, and the adoption of an efficient system of treatment for the reclamation of the desert area and the preservation of the extensive wooded region which still remains unburied.

So far as can now be understood or foreseen, the advancing sand will in time, if it is let alone, bury the remaining woodland and destroy the village and harbor.

Boston, Mass. *J. B. Harrison.*

Sawdust for Protecting Plants.

To the Editor of Garden and Forest:

Sir,—In your issue of September 30th Professor Massey writes on the value of sawdust as a protection for plants. I should like to add my testimony as to its merits as a winter covering. It is somewhat difficult in city gardens to procure an annual supply and care for it from year to year. It surpasses, however, every other material I have ever used for the purpose. I have found it very valuable for wintering Carnation-seedlings, as it carries them through without any appreciable loss, and it is worth trying for any plant that suffers from the cold or severe winds of winter. The proper article to use is coarse sawdust from large circular saws used for manufacturing lumber. Of course, this dust should be kept dry by a covering of boards or building-paper or anything else which will shed rain to a reasonable extent.

Milwaukee, Wis. *Charles L. Mann.*

Recent Publications.

Annals of Horticulture in North America for the Year 1890. By L. H. Bailey.

This volume follows closely the methods of the Annals for the year 1889, and the series promises to be of real value as books of reference. Of course it must be admitted that a compendious record of the advance in horticultural science and practice year after year would be a help to all who have any interest in gardening. This would be true if the work did no more than collect and classify facts that have already been published, and arrange them so that they can be conveniently referred to. But, as Professor Bailey says in his preface, it is very difficult to lay out a plan for such a series which shall include what is most essential and exclude all other matter. The author had determined, apart from the Annals proper, to publish in each volume an investigation of some particular branch of American horticulture, as he did, last year, in his Catalogue of American Kitchen Garden Vegetables, which was the most elaborate chapter in the book. This year he had decided to make a census of native North American plants which have been introduced into cultivation, together with their horticultural varieties, but the work was one of such magnitude that it has been postponed.

The first part of the book gives a general view of fruits and vegetables during the year, with statistics of crops and prices and the like. Ornamental plants and ornamental gardening is next treated in the same way, and this is followed by an interesting and valuable sketch of what has been accomplished during the year in the way of treating plant diseases and injurious insects. A list of the sub-titles of the remaining section of Part I. will give the best idea of the character of the subjects treated. They are: "Legal Control of New Varieties," "Nomenclature," "Road Agitation," "The Census," "The New Tariff," "Educational Matters," "American Wild Flower Clubs," "Societies." Part II. is devoted to special annals, including the introductions of the year and the plant portraits, together with a directory of the most important horticultural societies of North America and of persons in charge of horticultural work in the experiment stations, a list of botanic gardens in the world, a title-index to publications of the experiment stations relating to horticulture, and a subject-index of the same sort, the books of the year, a list of the horticultural periodicals and

a short notice of such tools and conveniences for horticultural work as have been invented and brought into use. Of course, no two people will agree as to what such a work should contain, but the matter presented has been carefully prepared, and the book will be gratefully received by the horticulturists of the country.

Notes.

The Chrysanthemum Show of the Massachusetts Horticultural Society has been postponed until November 10th.

The Horticultural Society of Florida has asked for three acres at the Columbian Exposition in which to show an orange grove and make a fruit display.

Visitors from the east are often surprised at the size of the Geraniums growing out-of-doors in California, where they attain a height of from twelve to fourteen feet, and are covered with bright scarlet blossoms.

Steam-pipes are said to have been made in England from the ramie fibre. This material is subjected to tremendous hydraulic pressure, and, having the property of being unaffected by moisture, will neither shrink nor swell, besides being a non-conductor of heat. The pipes are said to have a tensile strength twice that of steel pipes.

The ornamental fruits of some plants are hardly appreciated for decorative work as they deserve. A lasting and extremely tasteful combination seen a few days ago was that of clusters of the scarlet fruits of *Cratægus coccinea*, intermixed with short sprays of the white-berried *Symphoricarpus racemosus*, with a few green leaves, in a wide, shallow vase of dark blue color. It is worthy of remark that both the plants are natives.

In a paper on gardening read before a meeting of the Croydon Gardeners' Association in England Mr. Charles Gibson spoke of steam-power as an agency which has contributed very largely to the enrichment of gardens with plants from all parts of the world. It is the speed with which plants are dispatched on long journeys which renders the loss so much smaller than what it was formerly, and this change has been brought about by steam.

English horticultural journals are loud in their praises of *Clethra alnifolia* and its racemes of sweetly scented blossoms. Of course it is not new in England, but it is spoken of as somewhat rare among foreign shrubs. The fact is that it is too rarely planted even in this country, where it is a native. The Sweet Pepper-bush, which blooms from midsummer well into September, is not excelled by any shrub of its season for the fragrance and beauty of its white flowers.

Mr. Benjamin G. Smith, of Cambridge, Massachusetts, exhibited at the meeting of the Horticultural Society, in Boston, on the 10th of October, thirty-four different varieties of grapes, and received the silver medal of the society for his collection. The grapes were all cut from the vines the day before, and no copper salts or other mixture had been used to prevent fungal diseases. The general excellence of the collection was noteworthy, and it spoke well for the skill of amateurs in growing hardy Grapes in Massachusetts.

According to Downing's *Horticulturist*, the first specimen of *Paulownia imperialis* which bore flowers in this country stood in the famous Parsons nursery at Flushing, Long Island, and flowered in 1847. One of the finest Paulownias we remember to have seen must have been planted at about the same time as Mr. Parsons' tree, as it was of great size, and bloomed profusely at least as far back as the year 1858. It stood on the west side of Fifth Avenue, near Sixteenth Street, in front of a house which was torn down to make way for the present Judge Building.

Mr. H. W. S. Cleveland writes that there are no acorns on the Bur Oaks in Minneapolis and the region thereabout this year. As a rule, the sidewalks in many places in that city at this season are littered with acorns from the old Oaks which were left standing on vacant lots or have been preserved in the yards of private residences. This year not an acorn can be found in the city nor in any of the woods near by. Mr. Cleveland is interested to know how far this failure extends, and since it is a matter of general interest, we should be pleased to hear reports on the acorn-crop from readers in other parts of the country.

A correspondent of the London *Garden* speaks of *Abelia rupestris* as a very valuable shrub for clothing low walls on account of its neat growth, bright foliage and its long flowering season. It is said that while it is hardy in many parts of England, in others it requires the protection of a wall. It seems to flourish well in this country as far north as Philadelphia. In Washington it is one of the most interesting shrubs in autumn. It is planted very largely in the public grounds of that city, and it is covered for months with clusters of pink and fragrant blossoms. It forms a dense bush, and under careful pruning its slender, curving twigs assume a very graceful outline.

An American Carnation Society was organized at Philadelphia October 15th, with a membership of about fifty. The following officers were chosen: Edwin Lonsdale, President; William Swayne, Vice-President; C. W. Ward, East Moriches, New York, Treasurer; C. J. Pennock, Kennett Square, Pennsylvania, Secretary. The meeting adjourned to meet in New York during the Chrysanthemum Show, to be held there next month. The Executive Committee is composed of the officers as elected and three others, namely, Robert Craig, Philadelphia; R. J. Lombard, Wayland, Massachusetts, and James Hancock, Grand Haven, Michigan. The objects of the society are to improve the Carnation, to encourage the production of new and better varieties, and to discourage the dissemination of novelties which have no decided value. The society ought to accomplish a useful work.

Mr. M. A. Thayer, who has demonstrated practically that small-fruit culture can be made profitable in Wisconsin, has just published a report from his fruit farms at Sparta which, from his careful method of keeping accounts and the generous spirit manifested, seems worthy of commendation. Five years ago the question of growing small fruits there was doubtful, and he therefore gives a full account of his outlay and income. The first year he planted eight acres of Blackberries, seven of Raspberries and two of Strawberries, at a total expense of $1,618, with no income. The second year he added eight acres, and his total expenses were $2,462, and his income was $926. The third year he set ten acres more to small fruits; his expenses were $3,394, and his receipts $4,432, or considerably more than $1,000 profit. The fourth year, or 1891, the expenses were $4,500, and the receipts $8,846, with a profit of $4,346. The receipts and expenditures are itemized, and the report concludes with advice to beginners to go slow, doing only as much as can be done well, since nothing but the best production will pay, and it may safely be estimated that, besides the land, every acre of small fruit properly prepared, planted and brought to a bearing age will cost from $125 to $150, or their equivalent in honest work at $1.25 a day. Mr. Thayer's concluding counsel is: "Begin modestly, subscribe liberally to good papers, increase your plantation as experience is gained," and he promises to answer questions on particular points by mail or otherwise, or send short, plain instructions for growing small fruits, free, to any one who will send his name.

"All the world has agreed," said Downing in his *Horticulturist* some forty-five years ago, "that there is nothing more perfect of its kind than the rural architecture of England. The cottages of that country are as widely different in effect from those of any other as the Anglo-Saxon race differs from all else, civilized or barbarous. What this difference consists in there are, perhaps, few who take the trouble to analyze. Many persons suppose it to lie in pointed gables and high roofs. Still, these were not originally English, but were borrowed from Flanders, yet the Flemish cottages have little or none of the peculiar beauty which charms us in those of England. Others have imagined that it is something especially becoming in the features of the English landscape itself. Yet this can hardly be true, since we have seen faithful copies of the English cottage built in this country in equally picturesque scenery without producing upon the mind the same impression as the original edifice. The secret charm of the English cottage lies, we imagine, in its home-expression and its rurality. . . . The English cottage, even of the humblest class, is surrounded by trees, embowered in vines and creepers and hedged about with shrubs to a degree quite unknown in any other country. The love of trees and flowers is a universal passion in that country, and man, woman and child, among the cottagers, take an especial pride in the green adornments of their home. Slips and roots find their way from the pleasure-grounds of the nobleman's mansion to the humble garden of the cottage; and there is a personal and individual care bestowed upon them, even by those who have scarcely any other of the refinements of life, that neither the people of the Continent nor of this country have, as yet, any positive share of. The effect of all this taste is to spread a beautiful drapery about the rural cottages of England that renders what would otherwise be scarcely more than rude cabins little gems of rural and picturesque beauty. Indeed, strip most of the loveliest cottages of England of their sylvan and floral enrichment and they would absolutely lose their whole power of charming."

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The Effect of Gardening upon the Mind.

A TASTE for gardening is one of the elemental impulses of humanity. There are individuals without it, as there are people without sight or hearing or a sense of smell; but, on the whole, to dig comes naturally to man, and at some time or other in the course of his existence the desire to own a portion of the earth's surface is apt to seize upon him and demand satisfaction.

This impulse is of maturity rather than of youth, for gardening in its larger sense is a thoughtful pursuit, appealing to the broader qualities of the understanding. It is not merely the desire for healthful exercise which stirs a man, but also the wish to learn the secrets of our common mother, to force her hand, as it were, and compel her to reward his toil. The fable of the giant Antæus, who renewed his strength when he came in contact with the earth, has a subtle meaning, for it is by this contact that many weary souls have found rest and arisen refreshed.

To him who is tired of mankind the solitude and peace of a garden have a rare charm. Many a great statesman has turned from the cares of state to till his fields, or cultivate his flower-beds and trees, his alert brain finding full range for its activity in some scheme of landscape, or some great project for fertilizing a barren waste and rendering it productive.

Gardening gratifies the thoughtful mind, because it does not look for immediate results. It inculcates patience in all its teachings—patience not only with processes, but with results, for disappointments have often to be met; the best of schemes fail of accomplishment; new enemies arise on every hand, visible and hidden. To combat them requires perseverance, fertility in resource, promptness in action.

The gardener's life can never be purely contemplative. However fair his domain, he must perforce keep his eyes open in it, and his mind active. Vigilance must be his attribute, or he will have cause for regret. By watching he learns what to do and what to leave undone, the habits of the plants he tends—their needs, their uses, the different phases of their beauty. Unconsciously he becomes educated, and his mind lays up new stores of facts and deductions for future use.

The planter also grows in unselfish zeal as his plans increase in scope. He prepares for the future race, not alone for his own joy. The trees he disposes for another generation to sit under; he plants timber for the heir to cut; he adds to his broad acres that he may leave them to his children. For himself the toil, for others the fruit of his labors, and thus, setting aside his own recompense, he comes into a larger manhood, into that fullness of life which only belongs to him who has forgotten self and lives for an end he cannot hope to see.

From all this training should result endurance of unavoidable evils, fortitude in disappointment, serenity of mind. Thus the garden shows itself to be a school of the higher virtues, of patience, of tranquillity, of vigilance, of fortitude, of unselfishness and high serenity.

More lessons than these it teaches, therefore small wonder that the groping soul of man, ever seeking higher things, turns to this simplest pursuit as a child to its mother, finding in her arms comfort for his unrest. Unconsciously he seeks this school, which is so great a help to his spirit, and thinks often it is the pure air and exercise alone that have given tone to his nerves, and fresh vigor to his understanding.

But, after all, the best thing the garden does for man is to imbue him with a love for home, to anchor him to that one spot of the earth's surface which he calls his own, and to which he can impart some portion of his own individuality. The acres he has tilled, the garden-plot he has watered, will always be dear to him and to his children, and it is this desire for a home and an inheritance for those who shall come after him, that drives him to the purchase of land and the beginning of agriculture.

A man who owns a freehold in his country becomes of account at once; it lifts him from the position of a transient into the dignity of a resident; he gives hostages to fortune; he becomes an established citizen in place of a possible tramp, and is of more value in the community forthwith. The effect upon himself is elevating and composing. It stills his restlessness, allays ennui, turns the current of his mind into new channels, provides him with an amusement for his leisure hours, while giving occasion for healthful exertion, as well as stimulating wholesome thought. It is opposed to morbidness, it forbids subjectivity, it rouses the imagination, and gratifies the love of beauty.

There is that fine largeness of quality in it as an amusement that appeals to the simplest minds, as well as to the most comprehensive. It is this which proves that it is elemental and human to love a garden, to enjoy the soil, to find comfort in watching the development of plants and trees, and joy in their blossom and fruitage.

In America we need just this to give us stay and balance. In the older world, where habits are more established, the taste is strong. Here it is overgrown by many things. In so great a land as ours one portion of the soil seems not enough for the citizen. He wants a ranch in Colorado, an Orange-grove in Florida, a sea-side home on the coast of Maine, in addition to his city dwelling. But as the crowd increases and the nation ages, more and more will men concentrate their energies upon one spot, and the love of home and locality will grow more intense, as it is apt to do in the human being as years bring greater quiet to his spirit, and make rest his choicest blessing.

When we are at last sure that our children will be content to reap what we have sown, to repose under the trees that we have planted, solidity and peace will come to us, and life will grow more simple and more pleasurable to our people. Then will the garden be the true pleasure-ground, and its wise stillness will pervade the character of the men who find its culture a real education, and there

learn the needed lessons of perseverance, and patient waiting for the good the future brings, leading lives without hurry, full of calm interest in their surroundings, and with no wish for change.

Village Improvement Societies.

At the recent annual meeting of the Beverly (Massachusetts) Improvement Society, Professor Goodale, of Harvard University, made a few remarks relative to the work of village improvement societies in general. He said that the range of plants used for decorative purposes in the northern states can be much widened. It is a general principle in vegetable physiology that many plants thrive much better when transferred to climates and soils similar to, but not identical with, those of their nativity. This is illustrated in a striking, but unfortunate, manner by the common plants which have invaded parts of Australasia. The thistles and brambles attain a size and vigor unknown in their former home in the Old World, while one of the Roses, well known as Sweet-brier, runs riot over large areas. It is a familiar fact that all of our troublesome weeds in the northern Atlantic states, with perhaps one or two exceptions like Rudbeckia, or Purple Cone-flower, are intruders from other countries, chiefly Europe and South America. On the other hand, the weeds of German gardens and agricultural lands are said by Professor Drude, of Dresden, to be mostly from the Mediterranean regions, but the invasions in the uncultivated districts are largely from America, such as Œnothera, the Evening Primrose, Mimulus, the Meask-flower, and Rudbeckia, just mentioned. Every one knows how admirably many of the Japanese and Chinese species of flowering plants grow in the Occident. This list of plants can be largely augmented particularly in the direction of arboreous and arborescent vegetation. We who live so near the Arnold Arboretum, at Forest Hills, only an hour's ride from this room, can see, if we choose, the progress of experiments directed toward this end. On those ample grounds, one can see for himself the oriental plants which are proving of worth here, and he can make his own selections of plants for the adornment of the streets of our villages. A little pressure brought to bear upon our enterprising nurserymen would increase the scope of their catalogues, adding thereto plants of promise from the eastern countries, China and Japan. Those which we now have in general use are favorites; the list should be lengthened.

Dr. Goodale spoke also in regard to the desirability of preserving some accessible nooks and corners for our native plants. Such shelters need hardly more than a supply of water to help their guests through the hard times of drought which are sure to come at intervals in our climate, and which are exceedingly destructive to transplanted vegetation. If these sheltered nooks are occasionally cleared from the ever-watchful and aggressive invading weeds they can be made to brighten many a spot which would otherwise be unsightly. Essex County has a high reputation for the attractiveness of its native vegetation. This reputation is very largely due to the fact that the county has long possessed ardent and successful students of botany. From Cutler's time, through that of Oakes and Russell, down to the present, when Robinson and Sears and many others have taken up the agreeable task, the attention paid to the native plants of the county has been remarkable. The results of this attention are partly treasured in the excellent collections of the Peabody Academy, in Salem, and are practically at the command of any citizens of the county. There is no excuse here for not making much of our native plants. Other counties in the Atlantic states ought to emulate the example of this county.

Another of the topics taken up by the speaker was the change which has come over the manner of looking at certain features of plant-life. The relations of the soil to water and air, and to the chemical substances which form the so-called ash-constituents of plants, are among the most interesting subjects in nature. The plant stands midway between inorganic matter and animal life, manufacturing from water and what we may well call "impurities," of various kinds, organic and organized substance, part of which is utilizable by animals as food. Of late years we have come to believe that through the agency of infinitely minute organisms, known as microbes, part of the nitrogen in the air, clinging to soil, may be combined with other elements in such forms as to be available to plants.

Another change which has taken place in our method of looking at plants comes from conclusive evidence that all the living matter in the plant is connected together, even where the cell-walls seem at first to be closed partitions; and thus all portions of the plant are constituents of a community, in the strictest sense of the term. Formerly it was held that the conjoined organs and contiguous cells throughout the organism are parts of a corporate body. This true view is rendered more impressive by the conviction that all the living matter in all parts of the plant makes up a united whole.

Other topics discussed were, the principles which underlie pruning and the healing of wounds, the times for transplanting and similar practical matters.

Dr. Goodale expressed the view that the interest in practical questions like these, which come naturally before a village improvement society, can be much increased by occasional meetings during the winter, when, by a suitable division of labor, the freshest intelligence relative to advance in vegetable physiology and horticulture can be presented by the members and familiarly discussed.

Great Hill: A New American Country-seat.—II.

From the north side of the house at Great Hill we look over the lawn, already described, which is bounded on two sides by woods, and on the third by the sea; and the woods continue, running near the west side of the house, down to the water's edge on the south. Here the main front looks over a still larger lawn, comprising some eight or ten acres, while a narrower expanse of sward lies between the building and the eastern shore. Thus the lawns, taken as a whole, are flanked on two sides by forest and on two by blue water. The whole expanse they now cover was, a few years ago, a tangled mass of bushes and stones and little trees, with here and there a few of larger growth. The labor of clearing was great, but, fortunately, the slopes were naturally beautiful. A straight gravel walk leads from the east door to a stone pier; but on the south the main stretch of lawn is not cut, but encircled by paths, one lying close to the forest on the right and the other not far from the water on the left. All along the water's edge is a low growth of shrubs, vines and flowers, chiefly Sumachs and Golden-rods, which make a beautiful border when autumn approaches. The walk near the water passes at a little distance from the house through an irregular group of trees, small Oaks and tall gnarled old Tupelos, the latter forced by the denser growth that once surrounded them into a shape so unlike that which is typical of the species that it needs a close examination to prove them what they are. Otherwise, the lawns are unbroken, save for a few small Oaks and Pines, left here and there in well-chosen positions, which, with the lapse of time, will become interesting trees. The lawns are not so smooth and velvety as those one finds at Newport or Lenox, but for this very reason are all the better in keeping with their surroundings. They are well covered with thrifty grass, and are visibly lawns and not pastures; and their green is bright enough to form a vivid contrast with the blue of the water beyond and the somewhat dusky tone of the Oaks which chiefly compose their bordering woods. Nothing could be simpler than the scene or its arrangement; but its pronounced simplicity constitutes its striking charm. Seldom does one see such broad stretches of sward contrasted with such simple masses of forest and framed in so beautiful a circle of water, with the long line of the Falmouth shore lying against the horizon. No details attract the eye to the disturbance of the general effect of breadth, dignity and repose, and nothing has been done to alter the essential character of the spot as Nature designed it. One would certainly be at a loss where to look for another country place of anything like this size of which it could be said that not a tree or shrub or flower has ever been planted. But this is true of Great Hill, if we except only a few vines which clamber up the piazzas of the house and some narrow flower-beds close to its foundations. Not a tree is in

sight from the house which any one would call a "good specimen," even of wild growth, yet the groups they form are just what the eye demands; and not a spot of color breaks the quiet greenness except where some wild flower grows at the edge of the forest or the Sumachs burn along the water's edge. There are very few owners, I fear, who would not be tempted to set out trees of other species than those which naturally grow here, and to "enliven" the far-stretching lawns with ornamental plants and flower-beds. But a single innovation of this kind would ruin the beauty which now exists, and I can fancy no worse fate for Great Hill than to fall into the hands of an owner with "a taste for horticulture." Any one with a taste for Nature, a taste for beauty developed and clarified but not modified by art, must be thoroughly content with it as it is. May the day be far distant when a white-blotched Negundo or a scarlet Geranium shall intrude upon its broad simplicity and spoil its thoroughly local character.

From the foot of the main lawn one looks westward along a shore which curves out into successive points, clothed with forest to their tips, until, afar off, Bird Island Light shows white against the sky. For the most part there is only a narrow pebbly beach, although, about a mile away from the house, there is a long and broad beach of snowy sand. But these little beaches are, to my mind, as attractive as anything at Great Hill. The forest comes quite close to them, and, the soil being somewhat swampy, it is composed of larger trees than those through which the entrance drive conducted us. And in front of the trees, coming boldly down to the edge of the sand itself, are the most luxuriant masses of shrubs and creepers, bright at every season with a changing wealth of blossoms. Here one sees Willows, Alders and Black Alders, Roses and Cat-briers and Beach Plums, Blueberries and Sumachs and Grape Vines, Wild Azaleas and Andromedas and a score of things besides, crowding one another close and crowding as closely as they can to the water's edge, while now and then they break away to surround a tiny bit of genuine swamp, covered with Cranberry-vines. If a gardener would like to see how a shrubbery should look, edging an expanse of gravel, he could not do better than come and study these which Nature has planted along the little beaches at Great Hill.

All this large property is not given up to mere beauty; but the cultivated tracts and the various farm-buildings are hidden away among the woods, so that one must seek before seeing them; and the same is true of the water tower, which so often mars the effect of a sea-side estate. For a considerable distance from the shore the woods remain untouched save by the construction of a drive, several miles in length, which follows near the water, rounding the head of Wing's Cove and continuing to the confines of the place. In this third drive we have forest and shore views combined. Now we seem to be in the heart of a broad wood, and the next moment find ourselves between the woods and a wide salt-marsh, or between the woods and the water itself. Some very large Pitch Pines and ancient Tupelos occur in this part of the place, and each tree of the sort was scrupulously respected in laying out the road. As its purpose is merely to show the beauty of the place, not to take us anywhere in particular, directness did not need to be considered. And the same is true of certain little walks which, starting near the house, have also been cut through the woods. A pretty feature, which lies only a few steps away from the main lawn but cannot be discovered by a stranger, so inconspicuous is the "trail" through the tall undergrowth that leads to it, is a "deer-rest," made in imitation of those which the deer themselves used to trample out when the forest was wild indeed. It is simply a small circular space which has been freed from everything but grass, above which the trees nearly meet and around which the shrubs, freed from all restraint, have formed, in a couple of years, a high, impenetrable, odorous green wall. The Inkberry had long seemed to me the most beautiful of our native shrubs, but how beautiful it might be I had never realized till I saw it at Great Hill, in some such spot as this.

I need not speak of the other roads which, for more or less utilitarian purposes, have been cut through the woods at Great Hill, or of the pastures where flocks of sheep are feeding, or of the great meadows grown to hay, except to add that nothing, however utilitarian, has been done without a thought of beauty. There has been no ruthless clearing or cutting. The owner marks every tree that is to be felled, and none is ever felled which has any special claim of size, character or situation to plead in its own behalf. So we see here and there in fields and pastures a large Pine, an ancient Cedar or a particularly symmetrical Maple; and I have even been told of one small tract, surrounded by cultivated fields, which remains uncultivated because in the autumn the Gentians grow there in especial profusion. There are Cranberry-bogs also at Great Hill, and wild Grapes and Beach Plums in a profusion by which the housekeeper profits; but while her claims and those of the farmer are respected, Nature's claims are never for a moment forgotten. It hardly need be added that, though there are many workmen at Great Hill, there is no one who calls himself a gardener.

In praising so highly this place, which I have so often visited with ever-growing delight, I do not, of course, mean to set it up as a model for general imitation. Gardens and gardeners, planted trees and cultivated flowers have their part to play in the world, and it must always be a preponderant part when wild country sites are to be fitted for the summer residence of wealthy people. Yet I do think that it would be well if in sea-shore neighborhoods some such treatment as this which has brought the beauty of this place out of a tangled wilderness was adopted. It is adopted, I know, in many small properties; but Great Hill is remarkable as showing how well fitted it is even to estates of unusual size. Certainly, no other method of treatment could have produced so admirable an effect just here, where the forest already existed with a well-marked character of its own, and where the soil is not very easily persuaded to bear trees of other sorts. The chief beauties of Great Hill are its clear local character and its unity. Whether we are traversing the untouched portions of the woodland, following the lovely shore, or surveying the broad expanses of lawn, relieved, but not disturbed, by their Pines and Oaks and Tupelos, and broadly and simply contrasted with the encircling belt of woods, there is never a feature which mars the harmony or changes the general character of the spot. It is simply a piece of the Marion country beautified, but not essentially altered; and this, I believe, whether the gardener has had a part to play in the result or not, is what every country place in every part of the world ought to be. This owner was lucky in finding a spot which he could make habitable and beautiful without a gardener's aid, partly because the unusual, the unexpected, the unconventional is always attractive, but partly also because, when Nature is in an artistic mood, she can do better work than any other artist. But surely, also, the spot was lucky in finding an owner who appreciated his chance and could make the most of it. This he has done, not by starting out with a definite idea of what he "meant to do with the place," but by contenting himself for a time with roughness and incompleteness, living on the place, loving and studying it, and very gradually deciding what the next step should be. And only thus can any good work of art be produced when the materials used are those which Nature supplies, and, consequently, it is impossible to redeem mistakes once they are perpetrated.

Marion, Mass. *M. G. Van Rensselaer.*

Artificial Coffee-beans.

THE manufacture of artificial coffee-beans has, it appears, assumed some importance in this country, and specimens of the spurious beans have been sent to Kew by Dr. Brown Goode, the Secretary of the Smithsonian Institution. The idea of preparing artificial coffee-beans for the purpose of mixing with the genuine beans is, however, not entirely new. As long ago as 1860 coffee-beans, made from finely powdered chicory, were sent to the Kew Museums. The American beans are supposed to be composed of rye-flour, glucose and water; they are made to resemble, in size and color, a moderately good sample of roasted coffee-beans, and, by the introduction of a few genuine beans, are made to possess the aroma of coffee. The modeling is sufficiently good to deceive the ordinary public, but if the product is at all critically examined it is noticed that the groove on the flat surface is broad and shallow, and that it does not extend into the heart of the bean by a long narrow slit as in the real article; and, also, that there is no trace of the silvery skin at the mouth of the slit.

The introduction of spurious coffee-beans as an article of commerce in the United States is described in the following article from the *New York World*, reproduced in the Kew Bulletin:

"The average bulk of the genuine coffee imported into the United States is 8,000,000 bags, or 180,000,000 pounds, per annum. Experts estimate that fully twenty per cent. of the coffee sold to consumers is bogus, which raises the consumption to 216,000,000 pounds. Taking thirty cents per pound as the average retail price, the people of America pay $65,000,000 every year for this one article of food, of which $13,000,000 is paid for roasted and ground beans, pease, rye, or a manufactured article in no way resembling the Brazilian berry. To this must be added the production and sale

of what are called 'coffee substitutes.' So extensive is this business that it is quite safe to say that consumers pay $12,000,000 for what they believe to be cheap coffee. This raises the total expenditure to $77,000,000, and it represents a sale of 276,000,000 pounds, for the 'substitute coffee' usually sells at twenty cents per pound. It will thus be seen that 96,000,000 pounds of bogus coffee are sold in the United States every year, and some estimates place it at 120,000,000 pounds. Taking the lowest figures, $25,000,000 are received for substances which can be profitably placed on the market at six cents a pound. The manufacturers, therefore, receive $6,000,000 for their goods, while retailers gain a profit of $18,000,000. There are two kinds of bogus coffee, an imitation bean and the ground article. The bean is the most difficult to produce, and it is only recently that actual success in this direction has been attained. The bogus bean must not only look like the genuine berry when raw, but it should be capable of taking a proper color when roasted. A very good specimen is now manufactured in Philadelphia and Trenton, being composed of rye-flour, glucose and water. The soft paste is then moulded and carefully dried. To the eye of an expert the presence of this imitation is easy of detection, and it cannot be used to any great extent among wholesalers. But when coffee goes to the retailer adulteration begins. Sometimes the retailer is deceived, but nine times out of ten he is the one who introduces adulteration. The ground article is very easily produced in the proper color, and an aroma is infused by using strong decotions of coffee-essence.

"When mixed with real coffee even the expert eye and tongue may be deceived, while to the ordinary consumer it seems to be the genuine product. Bogus coffee-beans have only a slight resemblance to the natural berry, for though they possess proper form the cicatrice on the inner face is too smooth. Then, again, the gray color of the raw bean is not quite up to the mark, but when these manufactured beans are roasted with five per cent. of genuine coffee they find a ready sale. These bogus beans can be made at a cost of $30 per 1,000 pounds, and when mixed with fifty pounds of pure coffee the whole 1,050 pounds cost $37.50, or 3¾ cents per pound, so that a profit of nearly 100 per cent. is the result. There are any number of 'coffee substitutes,' the Hillis variety being the most successful. This company is already manufacturing 10,000 pounds per week, it being sold by the barrel to retailers in nearly all of the New England, middle and western states. The profits of this concern are supposed to be $300 per day, and its operations have reached such a scale that the stockholders were recently offered nearly $1,000,000 for their secret and business, but it was declined. No one accustomed to coffee-drinking would imagine that a decoction of this stuff was like either Mocha or Rio, but when mixed with four times its bulk of genuine coffee only an expert could detect the imposition. The manufacturers of these 'coffee substitutes' claim that they are not violating the law of adulteration of food-products, because they do not sell their goods as coffee, but simply as a substitute. While this may be true, it does not apply to the retailer, who mixes the bogus stuff with good coffee, and sells the whole as the genuine article. Though manufactories may be beyond the penalties of the adulteration law, they should be suppressed, for without them coffee adulteration by retailers would be impossible. When it is remembered that American people are compelled to pay $25,000,000 for ingredients that can be manufactured for one-fifth the sum received by coffee-growers, the necessity for the suppression of this nefarious trade is apparent. Oleomargarine cannot be sold as butter, neither should 'coffee substitutes' be made to masquerade under the name of Java, Mocha or Rio."

The production of artificial coffee has also received some attention in Germany, where an imperial decree has been issued forbidding the manufacture and sale of the machines for producing the artificial beans, which certain German newspapers have recently advertised. These artificial German beans are not intended in themselves as a beverage, but are to be used in trade for mixing with the genuine article.

Notes on the Distribution of Some Kansas Trees.—III. The Oaks.

KANSAS is credited with ten species of Oak, five of which are confined to the extreme eastern portion of the state. Only those having a more extended range will be mentioned in this paper. The most widely distributed, as well as the most valuable Oak of the state, is the Bur Oak (*Quercus macrocarpa*). This is found throughout the eastern counties and extends to the north-west as far as Bow Creek, a branch of the Solomon River, in Rooks and Phillips counties. From here the line of its western limit may be traced in a south-easterly direction to the Arkansas Valley, and along that stream out of the state in Sumner County. A noticeable feature in the distribution of this Oak is, that it is found in greatest abundance, and, at its best, developed on small tributaries instead of the main streams, and often the best growth will be well toward the head of a branch where the bends are small and the bottoms narrow. The rich deep soil of these bits of bottom-land seems better suited to its growth than the more sandy rich bottoms of the rivers.

Along the Solomon River five groves of this tree may be seen at the junctions of the most of its tributaries, and further up the valley, where there is little or no Oak-timber to be seen on the river a few miles back in the hills, on some small creek we may find scattering gnarled old trees, with short trunks and rugged, angular limbs, while among them will be thrifty young trees, just the size for good fence-posts, either single cuts or quartered. These young trees the traveler of twenty years ago will remember as only straggling bushes, springing up perennially as the fires burned them down. Others still younger are pushing out on the borders, the product of acorns dropped since the buffalo ceased to cut his sharp paths down the hills to water. Further east the older trees are found to be of better length of trunk and straighter grain, though, like the Cottonwood, the best of them have been hauled to the steam saw-mills years ago.

Occasionally one finds a block of the original growth which has escaped the axe; such a one may be seen on the head of Cedar Creek, a small tributary of the Blue from the east, a few miles from Manhattan. Here in an area of not more than an acre, thickly grown with a variety of hard-wood timber, I measured twenty Bur Oaks which averaged ten feet in girth at two feet from the ground and twenty feet to the first limb. The largest of these was fifteen and a half feet around. At present the home market for such timber is much better than it is for Black Walnut, Oak being in great demand for bridge-planking.

Next in an extent of area as well as in size comes the Chestnut or Chinquapin Oak (*Q. prinoides*). This finds its western limit in the lower valley of the Republican River, in Clay County, and on the Smoky for a short distance above its junction with the Republican. This Oak is more commonly found on high ground, often covering the steep faces of the bluffs fronting the streams, where it becomes dwarfed in habit, sometimes only a mere bush, sprouting from a spreading gnarly crown as often as swept over by the fires. Close to the small streams and in the bottoms, where the soil is rich, it occasionally becomes a stately tree. On the banks of the Blue River opposite Manhattan a group of these trees has been jealously guarded by their owner, who was one of the earliest settlers. Five of them which I measured averaged slightly less than ten feet in circumference at two feet above the ground, the largest being twelve feet and eight inches in girth. The wood of this Oak is tough and heavy, and, though cracking badly as it seasons, it is highly valued for posts and fuel. Occupying as it does the stony land and the narrower draws and ravines, there is not the inducement to clear the land for farming purposes, which causes the slaughter of so much valuable hard-wood timber. As there seems to be no basis upon which to separate the form called *Q. Muhlenbergii* by Dr. Engelmann from the smaller and more shrubby growth of the hill-sides, I have preferred to consider them all under the name given above.

Less widely distributed, but more abundant in its region, is the Black Jack (*Q. nigra*). In the eastern part of the state this is abundant, constituting the greater part of the scrubby growth which covers many miles of broken upland. As a mere bush it often crowns some rocky bluff or dots its steep sides; again, it is a dwarfed tree, growing in almost impenetrable thickets; in the more fertile soil bordering the bottoms it becomes a rugged, knotty tree of sometimes two feet or more in diameter and fifty feet high. Whatever the size, it varies but little in character. Its bright red young leaves make a beautiful picture when they are opening. These, as they develop, become thick and leathery, shining dark green above and russety downy beneath, presenting a handsome appearance throughout the season. While maintaining their general wedge-like form, these leaves are exceedingly variable in the number and depth of their lobes, and trees of the extreme forms might readily be mistaken for distinct species if judged by this characteristic only. These leaves, tan-colored and dead, rustle on the twigs till the buds begin to swell in the spring. The bark of the trunks is black, finely checked and rough, shading off to the smooth iron-gray of the limbs, which are

closely set and stiff. With the numerous dead spines and stubs they promise sure destruction to the clothes of any one rash enough to try to climb them.

The most westerly upland growth of this tree is found covering the hills north of the Kansas River in southern Pottawattomie County. It crosses the Blue and is found in considerable numbers along the deeply cut ravines which enter this stream from the west, but this is the limit. I have found no trace of it on the Kansas or any of its tributaries above the mouth of the Blue. The Black Jack affords a fair article of fuel, but is of little value for mechanical purposes.

Closely associated with this species in distribution are the Black Oak (*Q. tinctoria*) and the Red Oak (*Q. rubra*). Of these the Black Oak more nearly resembles the Black Jack in the rough checked appearance of its black bark. It is a larger and better formed tree, and the thinner, deeply lobed leaves will at once distinguish it.

The Red Oak is by far the finer tree, and the iron-gray color and smoother appearance of the trunk, the lofty habit and fine open top, as well as the large acorns with flat shallow cups, and the slightly lobed leaves, readily distinguish it from the others. These three members of the Black Oak family all find their western limit along the west bank of the Blue River in Riley County.

Another member of the Oak family is worthy of mention as occupying about the same limits as the above-named Oaks.

Fig. 79.—Senecio Heritieri.—See page 510.

The *Ostrya Virginica* is found along the Blue and the Kansas and its tributaries to a few miles west of Manhattan. It occurs mostly in secluded rocky ravines along the breaks of the limestone bluffs, and nowhere attains the size to which it grows in the moist woods of Minnesota. Specimens of more than eight inches in diameter and twenty or thirty feet in height are rare in this range.

It is at least a curious coincidence that the field occupied by these last-mentioned trees is nearly identical with that of the glacial drift in north-eastern Kansas. Whether this may have been the cause of their distribution over this limited area only must be purely a matter of speculation, but the fact that these species are so common in Nebraska and Minnesota over the glacial territory would at least be suggestive.

Kansas Agricultural College. *S. C. Mason.*

New or Little-known Plants.

Senecio Heritieri.*

THIS plant was in cultivation at Kew more than a hundred years ago, having been sent thither from Madeira, presumably by the Kew collector, Philip Masson. A figure of it was published by Curtis in the second volume of the *Botanical Magazine*, t. 53 (1787), where it is stated to have been introduced from Africa, but it is now known to be a native only of Madeira and Teneriffe, where it grows in the fissures of rocks. It belongs to the same section of the sub-genus Cineraria as the Madeiran *S. populifolia* and *S. cruenta;* both of which are also in cultivation at Kew, the last-named being the supposed progenitor of the popular garden Cinerarias.

Wild specimens of *S. Heritieri*, as well as the plant represented in the *Botanical Magazine*, are so much smaller and more sparsely flowered than the cultivated examples of it now at Kew that one might almost declare them to belong to different species. And yet Curtis, writing in the *Botanical Magazine*, stated that, "In the beauty of its blossoms, this species of Cineraria, lately introduced from Africa, by far eclipses all the others cultivated in our gardens." The plant represented in our illustration on page 509 is immeasurably superior to anything seen by Curtis, and although we have many beautiful Cinerarias which were not in cultivation a hundred years ago, I question if *C. Heritieri* does not still surpass them all as a greenhouse plant.

It forms a loose many-branched shrub about a yard high, and by a little pinching and staking it may be made to look like a good specimen Chrysanthemum. The branches are zigzag and thickly clothed, as are also the petioles and under surface of the leaves, with a white felt-like tomentum; the upper surface of the leaves is gray-green. The flower-heads are borne in very large panicles on the ends of the strongest shoots, and in smaller clusters on the weaker branches. Each head is an inch and a half across, daisy-like in form, the ray-florets white and rosy crimson, the disk almost purple. They are exceedingly beautiful in color and most graceful in their arrangement upon the plant; moreover, they emit a powerful violet-like odor, and they remain fresh upon the plant two months if kept in a cool greenhouse. I do not think we have any more beautiful greenhouse flowering-plant at Kew than this, and I can imagine its becoming a universal favorite for all sorts of decorative work.

The cultural requirements of this species are not unlike those of the Chrysanthemum, except that it requires a few degrees more warmth, and it does not appear capable of bearing frost. At Kew it has been grown from cuttings struck in summer and potted in good loamy soil, the final shift being into an eight-inch pot. The plants are kept in a cold house or frame all summer, exposed to plenty of sunlight and watered liberally. They come into bloom in May, and are not out of flower until well on into July. This year a few of the old plants had their shoots shortened back after flowering and were repotted, one being planted in a sunny border. They soon made new growth, and they are in flower again now (September). I am told that in some parts of Italy this Senecio is a favorite summer-flowering plant for borders; I should not be surprised if, in the warmer parts of North America, it proved a good substitute for, or companion to, the Chrysanthemum as a border plant. The group of plants, of which this and *C. cruenta* may be considered the types, are now included in the genus Senecio. To be strictly botanical, therefore, the Cinerarias, which are a feature in almost every greenhouse, should be called Senecios, but I doubt if horticulturists will ever accept this change. If called a Senecio then, *S. Heritieri* would be the correct name for the plant here figured, but if Cineraria is preferred, then it is the *C. lanata* of Lamarck. The true *C. aurita* is a very different plant from this, although the name has somehow got attached to it in the few gardens where it is at present cultivated.

Kew. *W. Watson.*

* *Cineraria lanata, Bot. Mag.*, t. 53. (*C. aurita*, Hort.)

Foreign Correspondence.

London Letter.

Insectivorous Plants.—At a recent meeting of the Royal Horticultural Society an exhibition and lecture on Insectivorous or Meat-eating Plants was the special attraction. The exhibition was not as large or comprehensive as was expected, but the lecture, which had been prepared by Mr. Lindsay, curator of the Royal Botanical Gardens at Edinburgh, was full of interest, both for botanists and cultivators. Apart altogether from the extraordinary carnivorous propensities of Nepenthes, Sarracenias, Droseras, Pinguiculas and Utricularias, to a knowledge of which Hooker and Darwin have contributed practically all we know, they have a powerful claim to the notice of horticulturists in their quaint, and, in most cases, decidedly ornamental leaves, besides, in Sarracenia, Pinguicula and Utricularia, in the beauty of their flowers.

The collections of carnivorous plants at Kew are a never-ending source of interest and wonder to visitors, many of whom have heard or read of the "voracious" habits of these plants. I have been asked for the "Colra plant, which had leaves like a Colra and could swallow rats whole," and found that Darlingtonia was the plant meant; I have also heard many visitors declare that these plants "were so dangerous to children and venturesome people that they had to be kept behind wire screens at Kew." Without trespassing into the region of romance the habits and specialized structure of insectivorous plants are scarcely equaled in the whole vegetable kingdom. It is perfectly true that they entrap and digest insects, that they derive nourishment thereby, and, in this respect, are on an equal footing with the animal kingdom. No botanical garden or teaching garden of any kind ought to be without a collection of these wonderful plants. It scarcely needs to be added that there are no good gardens in which Nepenthes, Sarracenias and Droseras do not find a place.

New Orchids.—*Cattleya intermedia*, var. *alba*, is a beautiful addition to Albinos. The type is one of the best of autumn-flowering Orchids and is very easily cultivated. Mr. Stalter, of Manchester, exhibited a plant in flower of the white variety last week, and it was awarded a first-class certificate. *Grammatophyllum Seegerianum* was shown in flower by Messrs. Seeger and Tropp, who introduced and named this species last year. It belongs to the same set as *G. Measuresianum* and *G. Fenzlianum;* indeed, it is not unlikely that the three will prove to be forms of one species. The plant shown bore spikes four feet high, carrying numerous flowers two and a half inches across, not unlike the flowers of *Ansellia Africana*, the color being greenish, with blotches of chestnut, the lip brown.

Cypripedium Antigone.—This is one of the most beautiful of hybrids. It was raised by Messrs. Veitch & Sons from *C. niveum* and *C. Laurencianum*, and it flowered in 1890. It has since passed into the hands of Baron Schroeder, who exhibited it in bloom last Tuesday, when it was awarded a

first-class certificate. The flower is large, well-balanced, and is white, suffused with rose. The flower produced this year is far superior to that of last year.

C. Polletianum.—I noted this last year as a beautiful hybrid which Messrs. Sander & Co. had raised from *C. calophyllum* and *C. œnanthum superbum*. The last-named is one of the choicest of hybrid Cypripediums, but its offspring is generally voted to be a better plant. The flower is very large, with the form of *C. Laurencianum*, the dorsal sepal deep purplish crimson, margined with white and spotted with chestnut. The petals and lip are even darker in color than the dorsal sepal, while the whole flower shines as if varnished.

Kew. *W. Watson.*

Bermuda Potatoes.

THE Bermuda potatoes are all grown in the winter months. The Early Rose and Prolific are used for early planting, and any kind of red Potatoes for the later planting. Of the red kind more Garnets than others are planted.

Red has become by unwritten law the Bermuda trademark, and dealers in New York City do not care to touch a late Bermuda Potato without it be red. Their customers, the grocerymen, say the public do not believe a potato is from Bermuda unless it is red—"that the red soil colors it!"

Many farmers are now, October 15th, planting Early Rose, which will be harvested in from eighty to ninety days after the planting, or about New Year's. When these fields are harvested, the farmer immediately puts in late Onions, and gets two crops in one season.

From now on up to February 15th the farmer will plant potatoes as seems best or convenient, and the harvesting from these successive plantings is kept up to about June 1st. No doubt a northern farmer would be delighted if he could have four months of the year for planting and a corresponding four or five months for harvesting. No one plants after February 15th, as plantings after that date run to enormous tops—sometimes six feet long—but not a tuber will set.

Our potatoes for planting all come from the north, as potatoes grown in Bermuda, and with great care kept over the summer, are almost worthless for planting. Arrangements are made with farmers in Maine, the Adirondack region, Nova Scotia and New Brunswick to grow our red potatoes for planting. Our Early Rose come from New York.

We have great trouble to make these seed potatoes sprout, as potatoes which have gone to sleep in a northern climate, not contemplating an awakening until April or May following, do not readily arouse; they are more inclined to rot than sprout, and it will not answer to put them into the ground until they have sprouted. Probably the most successful way to sprout them is to spread them upon a dry floor for a few days until they are thoroughly dried off from the steamship sweat. Those inclined to rot should be picked out, and the others put back into barrels and kept in a dry warm place. As soon as the eyes begin to show signs of starting the potatoes are cut into pieces with two or three eyes and directly planted in the ground.

The method of planting, after the ground is thoroughly prepared with manure or an artificial fertilizer, is as follows: A garden line is stretched across the field, and a man, following this line, takes each piece of potato and pushes it into the ground some three or four inches. These rows are from eighteen to twenty inches apart, and the potatoes from four to six inches in the row. This is a slow, laborious process, but it is much the best way, as the growth of the Potato here is somewhat different than in the north. There each Potato-plant sends out roots in different directions four or five inches long, and on the end of these rootlets the potato is formed, frequently making a large hill full of potatoes. Here the potato "snugs up" close to the plant, only forming from one to three good marketable potatoes to each stalk. By no known method can the potato be induced to stray away from the stalk, so we strive to have as many stalks or plants to the acre as is possible. After the rows can be seen through the field, men are put in with spading forks, spading carefully between each row, the rows being so close together that a horse cannot be used. A week or ten days afterward the potatoes are hilled up (or, as we say, moulded) by hoe, and nothing more is done with them until harvesting, as the potatoes soon cover in the ground and no weeds can grow.

We do not speak of so many bushels raised to the acre, but so many barrels raised from a barrel of seed. The amount raised is usually from three to six barrels from one barrel planted, though eight and ten are not infrequent. The yield per acre is probably from one hundred to two hundred bushels. If we did not get large prices there would be no profit in this crop.

I give below a statement of account with 115 rods of land (120 rods would be three-quarters of an acre) which I planted in the winter of 1889-90. The planting was at different times, from December 1st to January 5th, and I harvested them from March 27th to April 24th. These were Garnet's late potatoes, and the season was well adapted for potatoes. I bought all the manure and seed and did not do any work myself, and, of course, the workmen did not work hard enough to hurt themselves. I dare say if they had been working on their own crop they would have performed the labor at half the cost. A good Yankee farmer, leading his own workmen, would have realized a large profit from these 115 rods, but in this land of shiftless ways, with a seeming effort to do all things in the slowest way it is possible to find, I made only a fair profit.

An account with 115 rods of land for potatoes in Bermuda Island:

1890.	SALES.		
March 27th.—20 barrels potatoes		$6.72	$134.40
April 10th.—16 " "		6.00	96.00
April 24th.—17 " "		5.28	89.76
May 6th.— 5 " "	second size,	3.00	15.00
			$335.16

	COST.		
20 loads seaweed (36c.)	$7.20		
63 loads (1 horse) manure ($1.20)	75 60		
		$82.80	
38 bushels seed (96c.)		36.48	
58 empty barrels		11.76	
Labor to grow and harvest		84.98	
			$216.02
Net profit on 115 rods			$119.14

We have our trials from disease in the shape of a fungus-growth, which only attacks the plant-leaves when the potatoes are about half-grown and stops their growth. The disease may start in on one side of the field to-day and in two or three days' time it sweeps over the field, and the tops look as though a killing frost had prevailed. Nothing has yet been found to arrest this disease, so we meekly succumb, hoping for a north-east dry wind to come, which usually delays, but does not wholly stop its progress. We have another pest in the shape of the broken-tailed snail, which eats off the stalk at the base when tender; after the stalk becomes harder no harm is done. The Colorado potato-bug is not known here.

We shipped to American ports in the winter of 1890–1891 80,000 bushels, and we paid into the United States Treasury, in custom tax, the sum of $20,000, which the Bermudian feels to be infamous. We are looking forward with fear and trembling to the results of this winter crop. Under the McKinley law we have to pay into the United States Treasury twenty-five cents custom tax on every bushel we place in the New York market before we can come in competition with the United States farmer, and we fear this will so handicap us that our balance-sheet will show a loss.

Hamilton, Bermuda. *Russell Hastings.*

Cultural Department.

Adaptation to Locality.

NOTHING more important, I think, was brought before the American Pomological Society at Washington than Mr. Garfield's remarks upon the adaptation of fruits to locality. The necessity for this is comparatively but little appreciated, and many men, even those of long experience as fruit-growers, but feebly realize the immense importance to the commercial orchardist of a full understanding of this part of his business. A great number of failures are due to lack of knowledge on this point. In a recent issue of the *Stockman and Farmer*, Mr. R. J. Black, of Bremen, Ohio, illustrated the matter clearly in some remarks about the King of Tompkins County Apple, the Tompkins King of the revised nomenclature. Mr. Black says: "The excellence of this apple in Tompkins County, New York—latitude nearly forty-three degrees—is undoubted, but for planting in the central west it cannot be recommended. In this section it is only a moderate bearer; the fruit is generally imperfect, and it does not keep." Exactly this statement can be made of the Baldwin, as regards limitation of usefulness when grown west and south of New York. It then becomes a fall apple, does not hang well to the

tree, and the quality of the fruit—not high at its best—is much impaired. West and south of the Baldwin's limit the Ben Davis is at home. This apple is unquestionably of wide range, but, although it is hardy farther north than the Baldwin, the season is too short there, and it attains neither the size nor color normal to it in the Ohio and Missouri valleys. In quality this apple, when well grown, is barely good, but out of its range, northward, it is almost worthless. Among long-keeping apples, I know of none having so wide a range as Ben Davis.

Even summer and fall apples do not usually give satisfaction over a large territory, either in latitude or longitude. I think there are almost no real exceptions to this rule among our apples from western Europe and their American seedlings. The Early Harvest has been pretty widely distributed because of its earliness, and it has proved productive almost everywhere, but healthy scarcely anywhere. I venture to say that we are likely to find the tree-fruits that will prove valuable over the widest extent of territory in America east of the Rocky Mountains, among those of Russia and northern Asia. According to the American Pomological Society's list, as shown by the starring, the apples of the widest successful distribution within its territory are the Oldenburgh and Red Astrachan. The latter has more stars than any other apple in the list, and is double-starred for twenty-six states and provinces—extending from New Brunswick to Louisiana. Oldenburgh is double-starred for nineteen states, covering the same range. This, it seems to me, is probably so because the apples of western Europe are not so well suited to eastern America as the apples of eastern Europe and Asia. It is true that many of them have been very successful, and that their seedlings have often surpassed their parents. Nearly every popular apple in America (outside of the Russians) is a native seedling ; but excellent as many of them are, nearly every one has a relatively narrow range, both in latitude and longitude.

The Russian tree-fruits are, no doubt, of mixed as well as uncertain origin ; but it is probable that many, if not all of them, are either of home or more eastern nativity. They are mostly early in season, and particularly so when brought to this country and planted ten or fifteen degrees southward of their original habitat. But there is good reason to believe that, by growing seedlings from them, with skillful crossing, long-keepers of merit can be produced, adapted to all sections. Some such seedlings are already known. The Pewaukee, which is becoming popular in Wisconsin and Canada, is such a seedling from crossed Oldenburgh seed, and is a fair keeper. The lately introduced North Star, or Dudley's Winter, is said by its producer to be a pure Oldenburgh seedling, he having no other variety on his place. It is a good keeper in northeastern Maine.

It does not surely follow that because these fall Russian apples have a very wide range of adaptation all their American seedlings will resemble them in that respect. But I submit that, in the experience we already have with them and their seedlings, we have encouragement in thinking them to be a promising race of apples, with very acceptable characteristics ; and that the growing of seedlings from them, either pure or crossed with valuable winter varieties of the old stock, is worth the attention of our agricultural colleges and experimental farms. Heretofore the progress and improvement of our tree-fruits has been dependent almost wholly on chance, and so long as it depends upon individuals it will probably not be different in the future. But the work of the horticultural departments of our agricultural schools can be made continuous, and may be intelligently and perseveringly pursued to effective results. In thirty or forty years they could provide the country with a series of fruits for all seasons and sections, far more valuable than any we now possess.

Newport, Vt. *T. H. Hoskins.*

Vanda Batemanni.

IT is within five years of being half a century since this magnificent species was described by Dr. Lindley in the *Botanical Register* from a specimen which flowered a year earlier in the collection of Mr. Bateman, that being the first to bloom in England. The plant was discovered in the Moluccas by Gandichaud, who gave it the name of *Fieldia lissochiloides*, from a supposed resemblance to some member of the genus Lissochilus. The resemblance was not strong enough for Dr. Lindley, however, so he ignored botanical etiquette, and, after due explanation, named the plant *Vanda Batemanni*, out of regard for the great authority on Orchid matters. The genus Fieldia has been suppressed, and should not be confounded with Cunningham's mono-typic genus of the *Gesneriaceæ* of the same name which is still in existence. Some species of Vanda, including *V. Batemanni*, were separated from that genus by Reichenbach and given the name of Stauropsis, the one now recognized by such authorities as Hooker and Bentham. But this plant is known only as a Vanda to the great majority of gardeners and nurserymen, and it is highly probable that name will survive for many years to come.

These notes on nomenclature are the result of a careful investigation which followed a recent discussion as to the proper name of a plant of *V. Batemanni* now in bloom at the Harvard Botanic Garden. The specimen referred to has been in bloom since July, and gives promise of remaining in that condition several months longer.

Here is Lindley's graphic description of the plant: "It is a very large erect plant, with remarkably thick ærial roots, produced after the custom of its kindred, sword-shaped, two-ranked hard leaves averaging two feet in length, and a still larger spike of some score of flowers, each full two inches and a half across, flat, leathery and long-enduring. But it is not alone for their size that these flowers are so especially worthy of notice; their color is indescribably beautiful. If you look at them in face, they are the richest golden yellow, spotted all over with crimson; but when seen from behind, they are wholly a vivid purple, fading away at the edges into the violet of *Cereus speciosissimus*, so that, regard them which way you will there is nothing but the gayest and richest colors to be seen."

V. Batemanni should be grown in pots, in preference to baskets, on account of its large proportions. These should be filled to two-thirds of their depth with drainage material, upon which the lower roots may rest, filling up the remaining portion with sphagnum, which may be continued and rounded off two or three inches beyond the rim. The plant enjoys abundant light, and should have a position near the glass ; but, notwithstanding this, the fierce sun of an American summer is too much for it, and therefore it should be shaded in bright weather during the warmest months. A high stove temperature and plenty of moisture in the atmosphere and about the roots are indispensable during the greater part of the year. The temperature and atmospheric moisture may be reduced considerably in winter with much advantage, but the sphagnum about the roots should always be kept moist, and it must be replaced by a fresh supply when decay appears.

Cambridge, Mass. *M. Barker.*

Begonia Baumanni was introduced by Messrs. V. Lemoine & Sons, of Nancy, in the fall of 1890, and its flowering has been awaited with much interest, it being the only tuberous Begonia species yet discovered which possesses a distinct, clearly defined perfume. This species is said to have been discovered by Monsieur Sace, of Bolivia, in the central valleys of the Cordilleras and was first described in the *Revue Horticole* in 1886, under the name of *B. de Cochabamba*. The tubers are said to attain the size of a small melon, in some cases weighing twenty-four ounces. In the humid atmosphere of its native valleys the plants assume large dimensions and are in growth and flower about nine months of the year. The small tuber which is now in flower with me scarcely does justice to so vigorous a variety. It rested some six months, breaking in April, and has been grown on the greenhouse bench. It has given one stem, smooth, reddish, and erect about a foot high. The leaves are green, finely seamed and veined, reniform and alternate. The plant bears male and female flowers, carried well above the foliage on long stiff peduncles. The female flower is circular, with five petals. The male is furnished with only four, two of which are only partly developed, as is frequently the case with Begonias making an oval flower. The color is a clear rosy pink of a bluish shade, the female flower bearing a remarkable resemblance to those of *B. Maritani grandiflora*, though when well grown it is said to be three to three and a half inches in diameter.

There seems to be a distinct tendency in the petals to reflex under strong light. Both female and male flowers have a distinct agreeable fragrance, more especially in the morning. The odor is fully as marked as that of *B. odorata* and may be classed as a Tea-rose fragrance. Larger tubers and stronger plants will doubtless give better results, but there can be little doubt that *B. Baumanni* is a valuable acquisition for the Begonia fancier and the hybridizer. Some faint perfume seems to have crept into some strains of hybrid tuberous Begonias lately, but this species will probably add a more distinct odor to its crosses, while its erect habit and stiff peduncles are in the direct line of desired developments.

Elizabeth, N. J. *J. N. Gerard.*

Eulalias.—As single specimens on lawns or used as part of a group of subtropical plants in the summer garden, these

handsome grasses are indispensable. The variety Zebrina, probably the handsomest of all, was once considered doubtfully hardy, but here it stands the winter well, without any protection beyond its own dead leaves, which are burned to the ground in early spring. One of the most effective beds in the English garden at the place of Mr. H. H. Hunnewell is made up of tall-foliaged plants, in which this Eulalia forms part of the group, and it is especially effective in lighting up heavy-foliaged Cannas, Caladiums, and similar plants. The newer *E. univittata*, though not quite so rank a grower as the preceding, is a valuable addition to a not over-large selection of tall grasses. It is quite distinct, and particularly graceful as a lawn specimen. These Eulalias bear handsome plumes late in the autumn, for which alone these plants are cultivated in some parts of the country.

Shrubby Calceolarias.—Though very seldom grown now, as they have been displaced by the showy large-flowered herbaceous varieties, these are, nevertheless, worth a place where handsome pot-plants are required during the early spring months. Though the flowers are smaller, they make up in the quantity produced. They will endure rough treatment, and our plants are shipped to the city during winter, a distance of fifteen miles. Cuttings are struck during the summer, which usually require about two months for the process. These are gradually shifted into eight or ten-inch pots, where they bloom. The flowers vary in color between yellow, red and crimson. Many years ago these were common bedding-plants, but now they are seldom used.

Wellesley, Mass. *T. D. Hatfield.*

Correspondence.

A New Way to Preserve Fruit.

To the Editor of Garden and Forest:

Sir,—In the progress of my experiments in applying heat to the conversion of food-material into nutritious food by the use of the Aladdin oven I have perhaps discovered a new method of dealing with fruit which may be applied even without the oven, although it can more safely and completely be applied in the oven, for the reason that we have in the oven and lamp combined complete control over the heat. After a little experience in the adjustment of the flame of the lamp and of the size of the oven, we may put the heat at not exceeding 200 degrees, Fahrenheit, and maintain it at that point for any length of time. It is due to this complete control, without attention for a number of hours, that we have been able to do the work which I will now describe:

On the afternoon of the 3d of July a large quantity of currants were stemmed and placed in glass jars of the type known as the Mason butter-jars, a jar which holds about a quart, with a very wide mouth, surmounted by a glass cover resting on a rubber ring, and held down by an outer metallic rim which is screwed upon the lip of the jar. After filling the jar with currants the interstices were then filled up with cold water. Eight jars each were then put into two pans which fitted closely in the inner oven, one above the other. These pans were then one-half filled with cold water. The glass cover was placed loosely upon the jars without the rubber rings. The two jars were placed in the oven in the evening, the oven closed, a lamp of moderate power lighted at nine P. M., which gave, according to a registering thermometer, a heat of 200 degrees, Fahrenheit, a simmering, and not a boiling, heat, which has proved to be sufficient to kill any ferment or spores that might have been in the fruit, in the water or in the air.

There was a slight expansion during the night, with a little overflow from the jars into the pan. The pans were then taken out separately in the morning, and while everything was still hot, and had to be handled with gloves, the covers were quickly removed, the rubber rings put on, and then the metallic ring was screwed down. Everything was then left to cool slowly. The process took but a very few minutes.

These currants are now perfectly sound after passing through the dog-days in the store-closet; they have shrunk a little, but evidently no spores have got in, even though the jars are not completely full. When opened they have a finer flavor and as much freshness as if they had been cooked right from the bushes.

On the same day we put up a few strawberries with a little sugar, which kept well, but were so good that they have long since been consumed. I also put up a considerable quantity of cherries with a little sugar, and a few days later a large lot of blueberries and gooseberries. Later we have put up peaches with a little sugar, and tomatoes in their own juice.

In only one or two instances in eight dozen jars has there been any appearance even of mold. In one jar of cherries a little spot of mold appeared upon the surface, but there had been no fermentation; the contents were perfectly sound.

I was led to these experiments by the success of one of my correspondents in making jellies and jams in practically the same way. The fruit was simmered all night with a little sugar, strained in the morning and put up in the jelly jars without any further work being done on it, thus saving the stirring and the discomfort of doing the work over a hot stove.

We have since then put up a large amount of grape jelly and Beach-plum jelly in the same way in my own household. This process saves a great deal of work, a great deal of time and a great deal of discomfort. By not subjecting the fruit to a high degree of heat the natural flavors are not only retained but even developed to a higher degree than common.

I can conceive that this work may be done in other apparatus than the Aladdin oven, but it may require a little more attention in the process, as there does not seem to be any other cooking apparatus in which the heat can be brought to a given point and there maintained for a long period without close attention.

Two of these ovens have been made especially for surgeons, set at three hundred degrees, Fahrenheit, for the purpose of sterilizing surgical instruments, bandages, etc., for which purpose they serve with complete success.

It is possible that this method of dealing with fruit may enable us to secure from tropical countries some of those fruits, in nearly their natural conditions, which, in their ripe condition, will not bear transportation and cannot be preserved in the ordinary way with sugar. A correspondent in Porto Rico is about to try some experiments in this line. I can conceive that absolutely ripe pine-apples, served in this way, might give us a taste of the pine that we do not ordinarily secure in the specimens that we receive from the tropics.

Boston. *Edward Atkinson.*

The Southern Interstate Exposition.

To the Editor of Garden and Forest:

Sir,—This exposition, now in progress at Raleigh, North Carolina, has some features of special interest to students of Horticulture and Forestry. From a number of states the exhibits of woods are good, North Carolina naturally leading in this respect. Some enormous sections of tree-trunks from the western mountains well illustrate the great wealth of that region in hard woods, while many articles of furniture show the beauty of the Maples, Walnuts, Ashes, Sycamores, Cherry and other woods. Among the exhibits from Florida are many products characteristic of that state. Among these a large number of pine-apples, fruited in pots, attract attention. In the North Carolina Agricultural Department there are shown two products illustrating the wide range of climate in the state. Two Palmetto-trees from Columbus County guard the entrance, and between them stands a Balsam Fir, from one of the high peaks of the west. The Palmettos were, unfortunately, simply cut down with an axe, instead of being dug up entire. They are, however, held in an upright position, and show trunks about eight feet high and a foot in diameter, while the beautiful crowns of leaves on their long stalks make the full height over eighteen feet. One who knows the slow growth of these trees cannot help regretting their destruction for a paltry five dollars each. The Florida people could hardly believe that Palmettos grew to such size in so high a northern latitude. Two of the North Carolina counties exhibited alligator skulls larger than anything in the Florida exhibit.

Northern visitors are attracted by the size and beauty of the apples from the western mountain country. The fact is rapidly becoming recognized that western North Carolina is peculiarly the apple region of the United States, and the time is not far distant when the lands of that beautiful region will be sought after by orchardists from other sections. The Scuppernong grape and other varieties of the Rotundifolia class are well represented at the exposition. Several new seedlings are shown. The fact is curious that seedlings from the Scuppernong, which is a russety green grape, are almost invariably black in color. The two leading seedlings are the James and the Alliance grapes. The James is a large black grape, with a thinner skin than the old Scuppernong, and rather sweeter. It makes larger clusters too, sometimes as many as fifteen berries. The individual berries average over an inch in diameter, many being over an inch and a half. One gentleman reported three bushels from four-year-old vines. Baskets of these grapes look like large Damson plums. The Alliance is shown for the first time. It comes from Wayne

County, and in size is simply immense. In color it is a reddish black, and the individual berries are nearly as large as very large Damson plums.

The exhibit of wines from the Scuppernong and its varieties is very fine. There are two large exhibitors—the Tokay Vineyards, of Craven County, and the Garrett Company, of Halifax County. This last company has an annual output of over 80,000 gallons of wine. The Scuppernong wines are rapidly making a name in the markets. The enormous productiveness of these Grapes, and their capacity for making wines of a high grade, will soon make them the leading feature in the horticulture of eastern North Carolina. The James and the Alliance Grapes are both later than the old Scuppernong, and are not fully ripe until the middle of October.

Just outside the buildings of the Exposition the North Carolina Agricultural Experiment Station has thirty-seven varieties of Figs growing, and still full of fruit. These late fruits are smaller than the early crop, but show the characteristics of the varieties well. So far the best sorts seem to be the White Adriatic and San Pedro, but these plants have been cut so hard for propagation that their full value in fruit has not yet developed.

The Oonshin or Satsuma Oranges at this station, on the hardiness of which we base some hope, have made a fine growth this season. We hoped to have specimens of fruit this year, as one of our trees bloomed in the spring, but a deluge of rain at blossoming time destroyed the flowers. The young trees passed one winter without being injured, and should be in a better condition for supporting another winter. Whether they will pass all of our winters unharmed remains to be seen; but the fact is evident that this Orange is destined to move the Orange-belt a good way north.

Raleigh, N. C. *W. F. Massey.*

Vernon Park, Philadelphia.

To the Editor of Garden and Forest:

Sir,—The city councils of Philadelphia passed finally, last week, an ordinance to take possession of the Wister homestead, in Germantown, as one of its small public parks. This is the third of a series which, under Councilman Meehan's efforts, have been placed on the city plan, and which the city proposes to take from time to time in the future. The city long ago reached the limit of its legal right to incur indebtedness. Unfortunately, its loans were created for long periods, and although there is money enough in the sinking fund to pay half its indebtedness, it is considered legally in debt until the bondholders are paid. Philadelphia, therefore, cannot borrow money for small parks, but has to pay for all these and other large public improvements out of a $1.85 tax-rate, and one or two of these small parks a year is all it can venture on.

The small parks are located under the advice of Councilman Meehan, as chairman of a committee in charge of the subject, and, so far as possible, those localities are selected which have some historical associations. Last year the celebrated Bartram's house and garden were acquired, and now Vernon, the Wister homestead, is added. The mansion-house is a fine specimen of colonial architecture, and the six acres of grounds contain many good specimens of trees collected by early botanists in remote localities of our country, as they were at that time. The first specimen of *Magnolia macrophylla* was brought from North Carolina by Kin, a German botanical collector little known, but of wonderful zeal, and the tree is still growing here. There are also magnificent specimens of Oaks, Pines, Ashes, Kentucky Coffee and other trees. This plot, which will be known as Vernon Park, is in the heart of Germantown, which is the twenty-second ward of the city of Philadelphia, and will be a great boon to that community. It is a district now of nearly 50,000 inhabitants, and yet its only piece of public ground was a little plot of about 150 feet square. There was absolutely no place where even a sick child could be taken for an airing except along the public streets.

It is singular that a city of over a million inhabitants should have miles and miles of brick and mortar with not a solitary open space except the half-dozen small ones plotted by William Penn and his immediate descendants, though its one grand Fairmount Park, of nearly 2,000 acres, is some offset to this surprising negligence. The movement for better things, started by Mr. Meehan in 1883, is now very popular, and councils are overrun with applications for small parks from all parts of its 200 square miles of territory. This is the third park actually acquired out of ten located, and it is believed some four more will be located before the end of the present session of the city councils.

Philadelphia has to pay, by order of state legislature, out of annual taxation, nearly a million dollars a year for the huge pile of marble in the centre of the city, known as the Public Buildings. It is believed this heavy expenditure will end in about five years, and there is little doubt, if the present temper of the citizens continues, Philadelphia will then rapidly retrieve its reprehensible indifference to open spaces, so essential in these days to the good reputation of a progressive city.

Philadelphia. *S. A.*

Begonia Vernon.

To the Editor of Garden and Forest:

Sir,—In No. 185 (September 9th) of Garden and Forest we find a short note on the *Begonia semperflorens atropurpurea*, or *B. Nelsoni*.

We beg to be permitted to remark that that variety having been put upon the market by our firm last year, as you will see by the enclosed novelty list, it is but fair that our right as to its exact name be preserved during the first years at least, and we therefore must protest against the name of *B. Nelsoni* given in the above notes.

If you will please refer to the *Journal of Horticulture*, No. 2219, London, 9th April last, you will find a description of that Begonia, of which we beg to send you enclosed a copy, as also its exact name, which is *Begonia Vernon*, or *semperflorens atropurpurea*.

As regards the statement that the markings have not proved constant with Mr. Gerard, "who is inclined to doubt if they will prove so under your hot sun," we presume that that gentleman has not got the right sort, or has grown the plants under glass or in the shade, in which case they indeed do not show off well their bronzed, purple-tinged foliage.

The latter is seen in the best of conditions under our climate when the plants are grown in the full sun—that is, in situations where the sun shines upon them during the greatest part of the day.

Many American florists who saw the plant in our grounds all agreed that it was one of the finest bedding plants introduced of late years.

Paris. *Vilmorin-Andrieux & Co.*

[*Begonia Vernon* is the only synonym for *B. semperflorens atropurpurea*, and until attention was called by the above letter I was not aware that it had unconsciously been given another. The correct name was perfectly familiar to me, having had fifty plants labeled *B. Vernon* before me for months, and I am unable to account for the mental twist which led me to write an irrelevant name in my note. My plants were from Messrs. Vilmorin-Andrieux & Co.'s seeds, and, as suggested, have been grown under glass. It would seem a good plan for the introducers of new plants to note any peculiarities in their offerings, as does not seem to have been done in this case. Had Messrs. Vilmorin printed on their seed-packet or in their list the fact that the leaves of this variety only show their true character in the open, the experiment would have been tried, and probably a less disappointing report have been given. So far the result is, as given by me, a fine form of *B. semperflorens rosea*, with no indication of leaf-coloring. In my notes the intention is to report faithfully what I see in my own garden, not what is read or heard. The first hint as to growing this variety in the open came to me too late in the season for trial, from a friend who saw *B. Vernon* in Paris this summer, and reports it as fully bearing out all claims made for it.—*J. N. Gerard.*]

Periodical Literature.

The fifth number in a series of articles now being published in the *New Review* under the collective title "A Model City; or, Reformed London," is written by Professor H. Marshall Ward, and called "Trees and Flowers." The main question which the author considers is, "Are cities and towns like London, Birmingham, Manchester, Liverpool, etc., so polluted with gases and smoke and so darkened with soot and fog that the existing show of trees and shrubs is the best possible under the circumstances?" and his answer is, that he thinks he can show cause for believing "that the matter has been considerably exaggerated, and that, if the various local authorities were to take into account all the facts, they would come to the conclu-

sion that not only could much more be done, but that it is a national duty to see that much more is done in this matter of increasing the number and variety of trees and flowers in our towns and cities. Very little technical knowledge of the life-processes of plants and the conditions necessary for their welfare is needed to show that different species differ immensely in the degrees of susceptibility to injury by means of small quantities of acid fumes, such as exist in a diluted condition in the smoke passing off from the tall chimneys of a busy manufacturing centre; nevertheless, no tree will withstand the worst of the conditions found in centres of industry which daily give off small quantities of chlorine, hydrochloric acid or sulphurous acid; but then it must not be forgotten that these worst conditions are out of all proportion to the conditions met with in a city like London. Yet it is surprising to see how gallant a struggle for life is kept up by trees like the Balsam Poplar, the Black Poplar, the Alder, Sycamore, and some other trees even in the worst cases referred to." Coniferous trees, the writer continues, are not nearly so well able to stand these conditions, nor can the Oak, the Beech or the Birch long and successfully continue the struggle, though even these put up with more hardships than is popularly supposed. The chief point he wishes to make plain is that, at all events, in the smaller and more open English towns, many more varieties of trees will grow than have yet been tried, and that here, at any rate, "every effort ought to be made to plant some of the many beautiful North American and other foreign trees that can now be obtained and are known to be capable of easy cultivation in such localities. Moreover, there can be no doubt that much is to be done in this direction in London and other large cities in spite of crowded dwellings and periodical fogs."

Professor Ward then points out some causes for the frequent failure of town trees which do not lie in the unsuitability of atmospheric conditions, and his words show that municipal authorities often work in England pretty much as they do in America. Town trees are "fixed, when young, in a hole, probably filled with good soil, and this is carefully covered in, the young trees suitably staked and protected, possibly the soil round the base of the stem covered with a grating, and the result is—failure! True, it often takes several years to accomplish this striking result, but its inevitableness is none the less assured. While the tree is young, and its root-system is reveling in the pocket of good soil, provided with the overhead grating which ensures a supply of rain-water and air, and it may be of manure also, all goes well, and the head of foliage above is able to make the most of what sunshine there is and to manufacture the substances which supply the wood, new buds, new roots, and, possibly, even flowers. But the time comes when the pocket of soil is exhausted by the roots and they put out spreading thread-like rootlets to explore the soil around. And now comes the critical period; these young rootlets are covered with myriads of extremely fine hairs, and these delicate root-hairs are the only organs which absorb the water containing small quantities of substances such as salts of potash, lime, nitrogen, phosphorus, etc., in solution, and they are utterly incapable of performing this work of absorption in the absence of oxygen. Now, what are the usual conditions of affairs in the streets of a town? Even supposing these new spreading rootlets have good soil around them, and soil which is porous and deep, the rule is, that a practically hermetically sealed layer of flag-stones or asphalt lies above them, and their only chances of obtaining water and oxygen are through the grating and soil close to the stem. No doubt, the most is made of this, and the tree goes on for several years, doing better than it would if the flags or asphalt came up close to the stem. How often does it happen, however, that the new rootlets have nothing better to spread in than old brick rubbish or barren gravel; or, far worse, a soil which is saturated with the poison from leaking gas-pipes?"

Even sanitary appliances have an adverse effect upon town trees, for "the neighboring sewers may be taking off, as fast as they can, the water from soil round the roots, or the case may be otherwise, and the stagnant water, standing too long at the roots of the tree, deprives them of the oxygen necessary for their life and lowers the temperature beyond a minimum they could temporarily withstand. What has been stated so far is enough to show that the wonder is not that trees so often fail in the streets of our cities and large towns, but that the interminable and dreary rows of Planes, Elms and Limes that are planted ever come to anything at all." The author then notes the injuries which may come to town trees through the impact of vehicles, the gnawing of dogs and horses and the pranks of boys, and the danger of selecting, for street-planting, trees which send out long, straggling, superficial roots, running just under the pavement or road, because, as these roots thicken with increasing age, they lift up the flag-stones or other pavement, and, becoming a source of damage and danger to the street, are likely to be injured themselves by passing feet and wheels. The comparative brittleness of the limbs of different trees should also be considered before planting; and, after planting, proper methods of pruning or otherwise treating a tree which is in delicate health or has suffered external injury should be determined.

Although, says Professor Ward, for one reason or another, "the Oak, Ash, Birch, Beech and some others of our forest-trees are unsuitable for town-planting, this is no sufficient reason for flooding London with Planes, and Planes only, as if no such trees as Robinias, Laburnums and American Oaks, Ashes, Walnuts, Maples, etc., existed. Moreover, there is every reason to predict success for trees as yet undreamt of as town ornaments. Let those in authority try some of the hardy Magnolias—say *M. acuminata*, probably one of the best town trees—and extend their experiments to such as the Robinia, the Laburnum, the Tulip-tree, the Mulberry, Fig, Catalpa, and the beautiful Maiden-hair tree of Japan. The list might also include the Almond, Black Walnut, and various species of Sophora, Kolreuteria, Cercis, Gymnocladus, Acer, Rhus, Tilia, Liquidambar, etc. Some judgment would have to be exercised in the matter, of course, but probably all of the trees here mentioned would succeed if properly planted. . . . As regards Poplars, Ashes, Alders, Pavias, Limes, Gleditsia, Horse-chestnuts, Thorns, etc. . . . I will simply remark that these and many more can be placed in the list of trees and shrubs fit to be planted in large towns and cities; some, of course, are more fit for our cleaner and less smoky country towns, but many would resist the evil influences of a London atmosphere if properly planted and cared for." We have omitted the lists of shrubs, climbers and smaller plants which Professor Ward also gives, but may cite his mention of the fact that there was, a year or two ago, a fine specimen of *Ptelea trifoliata* flourishing in the heart of the city of London on the premises of the *Times* newspaper. "Surely," he says, "after this we need not despair, and it behooves all those who are concerned in furnishing towns with those 'lungs' so necessary for prosperity in the true sense, to bestir themselves and look through the lists of likely plants." It may interest Professor Ward to know that some of the American trees he recommends flourish well in the streets of American towns.

Notes.

Messrs. Pitcher & Manda announce an exhibition of Chrysanthemums, Palms, Ferns and Orchids at the United States Nurseries, Short Hills, New Jersey, to continue during this week.

During the famine which has recently afflicted the Volga regions, in Russia, the peasants have found their chief source of subsistence in bread made from a Chenopodium, the common way-side weed which we will call Goosefoot.

Professor N. S. Shaler, of Harvard University, whose excellent book on the "Aspects of the Earth" we reviewed a year or two ago, is about to publish another, called "Nature and Man in America," which will explain in a popular form the influence that environment exerts upon man.

A correspondent deplores the popular taste which makes it possible for a boy made of Roses, Immortelles and Carnations, and trousers made of Roses and Pinks, to be among the constructions spoken of as "beautiful and numerous floral tributes" at the opening of a business house lately.

The study of plants first existed as a branch of medical knowledge. When Hippocrates, "the father of medicine," compiled a list of all medicinal plants known to him only 300 were named. In the time of Theophrastus, the famous pupil of Aristotle, some 500 species could be described, and in the first Christian century, when Dioscorides wrote, 100 more were known.

Among the new books which should interest lovers of nature we notice "Sharp Eyes," a collection of studies of insect, bird and flower-life, by W. Hamilton Gibson; "Japonica," by Sir Edwin Arnold, and "The Warwickshire Avon," by Mr. T. Quiller-Couch, illustrated by Mr. Alfred Parsons. Of the charms of the last-named two we have already spoken during their serial publication in *Scribner's Magazine* and *Harper's Monthly*.

In *Insect Life*, for October, it is stated by way of example of what may be done to mitigate insect attacks, that in the states of North Dakota and Minnesota there has been during the

present year a probable saving, from the ravages of grasshoppers, due directly to the advice of entomologists, of not less than $400,000. This saving was accomplished by fall plowing and the use of "hopper-dozers." An estimate that has been generally accepted is, that about one-tenth of the agricultural products of the United States is annually destroyed by insects.

A recent writer notes the fact that the German botanist, Dillenius, who, early in the eighteenth century, devoted himself to the study of mosses, and was the first to distinguish them from the fungi, found, in the neighborhood of Giessen, where he lived, 200 species of mosses, of which 140 were new to science, and 160 fungi, of which 90 had not previously been known.

In Mr. E. W. Hervey's "Flora of New Bedford and the Shores of Buzzard's Bay," he says of *Gaylussacia resinosa:* "A white variety of this species is occasionally brought from neighboring towns for sale, but in small quantities. A small tract of land in Berkley, about fifty feet square, has borne an annual crop of perhaps a quart of white huckleberries for forty years or more. A few bushes bearing the ordinary black huckleberry are interspersed with those bearing the white variety. The white variety has also been found in East Fairhaven."

In some notes on the Flora of the Lake Superior Region, published in recent numbers of the *Botanical Gazette*, Mr. E. J. Hill says that in Minnesota blue and red flowers are especially bright in color, while white flowers reveal, in a more or less well-marked degree, a tendency to coloration. He thinks that these facts are probably due to the clear bright weather that prevails in Minnesota, as contrasted with those neighboring regions where more moisture exists in the air, and expresses a desire that others may record their observations upon the subject.

In an article in the *Independent*, among the growing industries of Florida, that of bee-keeping is named. The profusion of flowers the year round, and the absence of winter, does away with the necessity of feeding, a matter of great expense in the north. There are now many large apiaries in the state, notably one upon the Appalachicola River, that contains 1,200 stands of Italian bees. This apiary produces about 10,000 gallons of honey per year, which is extracted and sent to market in barrels, bringing about fifty cents per gallon. Put upon the market in attractive shape, the net income might easily be increased fifty per cent.

In an article called "Does our Indigenous Flora give Evidence of a Recent Change of Climate?" published in Bulletin No. 7 of the Natural History Society of New Brunswick, Mr. J. Vroom discusses the question whether the subarctic plants of this country "have lingered here since the glaciers receded, or have once passed on in their northern migrations and been again driven southward to replace less hardy species, and whether a general movement in either direction is now going on." His conclusion appears to be, that within recent geologic times our climate has constantly improved, and that the general tendency of plant migration is steadily northward.

The frequent want of taste we display in the environment of park statues, a theme which was recently discussed at length in our editorial columns, is well illustrated by the present appearance of the Seward statue on Madison Square. The figure itself is a poor one, and rising, as it now does, from a little forest of tall, variegated, foliage plants, its aspect is nothing short of ridiculous. Not a great deal better looks the figure of Washington on the Riverside Drive, for, although here the beds of Coleus and higher plants do not immediately encircle the statue, yet, as one approaches from either direction, it seems to be rising from their midst. A comparison of these effects with that of the Webster statue in the Central Park, partially draped to its top with Japanese Ivy, instantly shows the superiority of vines in such situations.

The credit of originating what is known as the "Landscape Lawn Plan" for rural cemeteries belongs to Adolph Strauch, who was born in Germany in 1822, studied landscape-gardening, chiefly in the famous gardens of Austria, traveled widely and eventually emigrated to this country in 1851. Three years later he took charge of Spring Grove Cemetery, in Cincinnati, and, after encountering much opposition, succeeded in laying it out in accordance with his own new ideas and thereby set a pattern which has been more or less intelligently imitated all over our country, to the unstinted admiration of European visitors. It is interesting to learn, upon the authority of an address republished in one of the reports of the conventions of the American Association of Cemetery Superintendents, that Strauch "was stimulated by the glowing descriptions of Chinese cemeteries in Humboldt's 'Kosmos'" and largely owed to them the idea of introducing kindred effects into American cemeteries.

A correspondent of the New York *Sun*, writing from New Orleans, says that, "under the auspices of the State and the Louisiana Agricultural and Scientific Association, a sugar school has been established in this city, and will go into operation here next month, for the purpose of educating all who desire to take the course in the culture of cane and the manufacture of sugar from it. The school is equipped with a corps of five professors—of sugar agriculture, sugar chemistry, analytical chemistry, sugar mechanics, and sugar-making respectively. It has a plantation attached with a small sugar-house on it, but one thoroughly equipped with the latest and most improved machinery, a library containing all the books and journals on sugar, and everything necessary to teach this industry. The course will be one of two years, at the end of which time the student will be turned out a thorough sugar-maker, a chemist prepared to carry on a sugar-plantation in the most scientific manner."

Mr. J. H. Hale writes to the *Country Gentleman* that, in his opinion, the Excelsior Peach will help to extend the cultivation of Peaches at the far north. In central Connecticut, a hundred miles north of a limit of safe peach-growing on the Atlantic coast, it is possible to struggle against borers, insects, the yellows and other discouragements with fair success, but the serious obstacle in the way of profitable Peach-culture is the killing of the fruit-buds by extreme frosts in winter, so that varieties like Late Crawford give only one full crop and two partial crops in twelve years. Oldmion, Stump, Keyport, White and Smock have given three full crops and as many partial ones in the same time, while Hill's Chili and Pratt have fruited nearly every year. Hill's Chili, however, is unattractive in appearance, and the Pratt rots badly on the tree. Mr. Hale has seen Excelsior fruit in New Hampshire when there was not another Peach in all New England, and he is satisfied that it is a variety which can be trusted to bear every year. The tree is of the Hill's Chili type, although rather more dwarf in growth, but the fruit is much larger, richer and of brighter color, and without the "wool" which is so objectionable in Hill's Chili. It sells as well as the Crawford, and for family use is of better quality.

It would be hard to imagine a more charming garden-scene, or one more artistically portrayed than the Primrose-garden in Surrey, which is the subject of one of the illustrations in a recent issue of *The Garden*, of London. It represents a wood walk lined with a few picturesque Birches, under which are great masses of the Yellow Primrose in bloom; and as this plant, the true English Primrose, is hardy in our northern states, with a little protection, we can endorse the views of *The Garden* when it says that "no flower better deserves a garden to itself than the Primrose. It is so old a favorite, and has been cultivated in so many forms, that any one determined to have a Primrose-garden may choose the kind he likes best and set to work accordingly. There are the single-stalked Primroses, the earliest of all, flowering from the middle of March onward, while some may be had in bloom as soon as the end of February. They range in color from pure white to deep primrose, and from palest pinky lilac, through strong red-purples, to a color nearly approaching blue, and there are also rich reds of many shades. The grand Primroses for garden effect are the large bunch-flowered kinds, white, yellow and orange-colored, red, crimson and rich brown; of infinite variety in form, texture, habit and coloring; easy to raise to any amount by seed, as also by division of the older buds." The garden which our contemporary illustrates was formed a few years ago "by making a cutting, about seventy yards long and varying from ten yards to fifteen yards wide, through a wild copse of young Birch-trees. The natural soil was very poor and sandy so it was prepared by a thorough trenching and a liberal addition of loam and manure, which has to be renewed every year. No formal walks are made, but one main track is trodden down, about two feet wide, about the middle of the space, dividing into two here and there where a broader clearing makes it desirable to have two paths in the width. The whites and yellows are kept at one end of the garden and the reds at the other, the deepest yellows next to the reds. The white stems of the Birches and the tender green of their young leaves help to make a pretty picture, which is at its best when illuminated by evening sunlight."

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The American Buckeyes.

THE North American forests are comparatively rich in Horse-chestnuts, or Buckeyes, as we are still apt to call them in America. The genus Æsculus, as it is now known, to which these plants belong, only contains thirteen species. Eight of these are American, if we include two little-known shrubs of southern Mexico and of the northern countries of South America, and another shrub of Lower California. Outside of America the genus is represented in south-western Europe, in the tropical forests of India, Assam and Burma, in northern and in central China, and in Japan. The different species fall naturally into two distinct sections. In the first the flowers are furnished with five petals, and the walls of the fruit, or pods, are thick and covered on their outer surface with sharp prickles. The common Horse-chestnut, which is a native of the mountains of Greece and which is now one of the most familiar of all ornamental trees, and the Indian species belong to this section. In the plants of the other, the flowers have only four petals, and the fruit is smooth with thin walls; they are American, Chinese and Japanese, and to them the name of Pavia was formerly given. The two sections are united, however, by one of our American trees, the so-called Ohio Buckeye, which has the flowers of the Pavias and rather thin-walled fruit, which, in its early stages at least, is covered with the prickles of the true Horse-chestnuts. And so it has seemed better to consider the Horse-chestnuts and the Buckeyes generically identical.

Five species grow naturally within the territory of the United States. None of these are so often planted here, however, as the European Horse-chestnut, and none of them, perhaps, are individually as beautiful as that tree, which surpasses all other members of the genus in the massiveness of its port, in the density of its foliage and in the magnificence of its great flower-clusters. But the massiveness and the formality of the head of the Horse-chestnut, while they make it a splendid object in some situations, render it a difficult tree to associate properly with other trees; and it usually looks out of place as an element in a picturesque landscape. Its value, however, for formal plantations, either in city streets or in the avenues of architectural gardens, was recognized in Europe two centuries ago, and no other tree has yet been found which surpassed it for such purposes.

If our American Buckeyes are not equal to their Old World relative in breadth and solidity of head and in floral splendor, they, in their turn, surpass it in grace and in their adaptability to harmonize with the other trees of the forest; and for general planting in this country they are, therefore, more valuable, especially the Sweet Buckeye, the *Æsculus octandra* of botanists, the largest, or, at any rate, the tallest of the American species. It is an inhabitant of the Alleghany region from western Pennsylvania to Georgia and Alabama, and of the Mississippi Valley. When it grows at its best, as on some of the slopes of the high mountains of Carolina and Tennessee, it is a noble tree, sending up a straight shaft two or three feet in diameter, sometimes free of branches for sixty or seventy feet, and often reaching a total height of ninety feet. The head is rather narrow and formal, and the branches are small and often pendulous. The leaves are of ample size, and are dark yellow-green, and rather paler on the lower than on the upper surface. The flowers are peculiar in the unequal size of the petals, the limbs of the upper pair being much smaller than the others and borne on slender claws which much exceed the calyx in length. The fruit is pear-shaped, often two inches long, and is beautiful and conspicuous. There is a variety of this tree found in some parts of the southern Alleghanies and in Texas with red or purple flowers. The yellow and red-flowered varieties are both hardy as far north as New England, and they are both useful ornamental trees, growing rapidly in good soil and harmonizing with the native trees of the north; and, unlike the Old World Horse-chesnut, they are not seriously injured by fungal diseases.

The so-called Ohio, or Fetid, Buckeye, *Æsculus glabra*, is the second of the Horse-chestnuts of eastern America which grows to the size of a tree. It is not as large as the Sweet Buckeye, and it is unusual to find it more than thirty feet in height, although sometimes, under the most favorable conditions, it grows to fully twice that size. The trunk and branches are covered with dark bark which separates readily into thin scales, and these make it easy to recognize the tree at a glance, even in winter and while still very young. The foliage is lustrous, dark yellow-green and rather conspicuous from the yellow midribs and veins of the leaflets. The flowers are of a pale yellow-green color, the petals nearly of the same length, although the lateral pair are much broader than the others. The Ohio Buckeye, which got its name from the fact that it was first known from the banks of the Ohio in Pennsylvania, belongs to the valley of the Mississippi; it is nowhere very common, and is even less common now than it was a hundred years ago. This is due in part, no doubt, to the fact that this tree always selects rich soil near the banks of streams or on river-bottoms, and has had to make way for the crops of the farmer. It is as hardy at the north as the Sweet Buckeye, but, from an ornamental point of view, is a much less desirable tree and hardly worth planting except as a curiosity.

The other Buckeyes of the east are inhabitants of the south, and do not attain to the dignity of trees. The most common of these two plants and the type of the old genus Pavia is the Scarlet Buckeye, or *Æsculus Pavia*. This is sometimes a low shrub, producing its flowers when only a few inches high, and sometimes reaches the height of a dozen feet or more with many slender straggling stems. It is widely distributed and very common in all the coast-region of the southern states, from Virginia to Texas, and west of the Alleghany Mountains, extending as far north as Kentucky and Missouri. The flowers are two or three inches long and bright red; they make a great show therefore, although

individually narrow and placed rather remotely in narrow few-flowered clusters; they appear with the unfolding of the leaves and offer a warm and cheerful welcome to the traveler from the snow and ice of the north as he first reaches the south in early spring. Although this pretty plant cannot withstand the severity of our northern winters, the name is often found in the catalogues of nurserymen who confound it with some of the red-flowered varieties of the Sweet Buckeye.

The fourth species of eastern America is the rarest of all our American Horse-chestnuts, although, strange to say, it is more commonly planted than any of the others, and, therefore, perhaps the best known. It is the *Æsculus parvifolia* or, as it was once called, *Æsculus macrostachya.* It is an inhabitant of the foot-hills of the extreme southern Alleghanies, where the younger Bartram found it, more than a hundred years ago, when he crossed from the sea-board to the head-waters of the Tennessee and saw, before any other educated man, the beauties of that marvelous region, covered then with one great forest, save where the Cherokee had made for himself a home by some swift-flowing river. The Dwarf Horse-chestnut, as the plant which Bartram discovered is now most often called, spreads, in cultivation, into a broad bush of compact habit, sometimes twenty or thirty feet across and six or eight feet tall. From spring to autumn it is a handsome plant as it stands out singly on the lawn, and in early summer it covers itself with long narrow spikes of slender creamy white flowers, made conspicuous by their long exserted stamens and yellow anthers. Although it is a southern species, peculiar to a region whose plants are not, as a rule, hardy at the north, the Dwarf Horse-chestnut flourishes in all parts of New England, where it flowers abundantly, although the season is rarely long enough for the fruit to ripen.

The last of the North American Buckeyes is an inhabitant of California—the *Æsculus Californica* of botanists. It is a low tree, sometimes thirty or forty feet in height, with a short stout trunk, often much enlarged just above the ground, and spreading branches, which form a wide dense head; or more often it is a shrub with stems ten or twelve feet high, forming dense thickets. It is widely distributed in all the foot-hill region of the Coast ranges and of the western slopes of the Sierra Nevada, from the northern almost to the extreme southern part of the state, lining the banks of many streams and the sides of innumerable cañons. The flowers of the California Buckeye are more beautiful than those of the other American species; they are white or pale rose color, an inch or more long, with broad, spreading petals and long conspicuous stamens, and are produced in long, very compact, many-flowered clusters. The fruit, which is pear-shaped and rather larger than that of our other species, is also ornamental. The only drawback to the California Buckeye, as it appears in the valleys of California, is, that the leaves, which appear early and are fully grown when the tree is in flower in May, ripen under the influence of the hot sun very early and often fall by midsummer, thus leaving the branches bare for a considerable part of the year.

An idea of the habit the California Buckeye is capable of assuming when it has grown under the most favorable conditions, and of the profusion of its flowers, can be obtained from the illustration which appears on page 523 of this issue. It represents a tree growing at San Mateo which is thirty-two feet high, with a head sixty feet in diameter and a forked trunk six and a half feet through two feet above the surface of the ground. It is an exceptionally fine specimen, although others nearly as large and symmetrical can be seen in the same region. For the photograph from which our illustration has been made we are indebted to Dr. L. D. Morse, of San Mateo.

The California Buckeye is not very often cultivated, although it was first sent to Europe nearly forty years ago and flowered in England as early as 1858. Unfortunately, it is not hardy in the eastern states, and probably, outside of California, it will never really flourish except in climates similar to that of the Pacific coast. It is well worth planting, however, in all the Mediterranean countries, and, perhaps, in Australia, as an ornamental plant, for it is one of the handsomest of the whole genus, and, when in flower, one of the most beautiful of all North American trees.

The Delayed Frost.

THE charm of a long autumn is very great, but seldom permitted by our capricious climate, which is apt to spoil the garden in September and then make the misfortune the more apparent by a succession of mild October days, when flowers and green leaves would suit the weather.

This year, which has made eccentric shifts of all the months in turn, giving us a dry April and a cold July, bestowed upon us a most enchanting autumn, mild and free from storms, so that vegetation remained perfect till late October, and the harvest-time was most propitious.

No early frost blighted the corn-field or marred the golden pumpkin's fairness. No rain made the apple and pear gathering a disappointment and a sorrow. Late flowers lined the garden-walks in unchilled splendor until mid-October, while the soft September haze and the mellow glow of the succeeding month showed Maples in full green leaf, and Oaks with only a touch of ripened crimson.

When the autumn comes thus slowly to maturity a tinge of russet and gold creeps softly into the landscape. Here and there is the accent of a red leaf or branch like the note of a trumpet in an orchestra. Soft browns steal into the meadows and form a shade on northern slopes. Dead are the Golden-rods and Asters, faded the road-side flowers. The Rose-hips make ruddy gleams in the bushes, and a few belated Barberries cling to their thorny stems in wizened splendor, while other berries, purple and black, cluster by the fences, and the nut-trees hang out their smooth or prickly burrs, promising a harvest of brown fruit.

This is the green old age of the year, cheery and fruitful, bountiful and rich. Gone are the hurry of spring and the burden of summer, the slow harvest has been gathered, and repose has come to the teeming earth. Now must the gardener look forward and plan for the coming season, and set his bulbs for spring blooming, and clear away the rubbish of dead stems from the flower-beds, and transplant perennials that they may blossom freely the following summer.

It is well in planting a garden to arrange for this season, which is so pleasing, by having a profusion of hardy plants that are not easily disheartened by a chill, and make a brave show as the year wanes. This is a care often neglected by public gardeners, who stock their parterres with ephemeral blooms that the first cold breath destroys, leaving but a dreary group of dry sticks behind.

Well mingled with these more delicate plants should be those hardy perennials that lift their gallant little heads and smile in the very teeth of winter. The hardy Chrysanthemum, the Marigold and Calendula are a delight in the late autumn, with their cheery tints. The Salvia, less hardy, is the glory of a September garden, and many another flower, with a little shelter at night, will make a walk gay and cheerful that would otherwise be gloomy with decay and desolation. The Japanese Anemone is a treasure at this season, and those bushes bearing ornamental fruit which hangs on even amid the snows of winter should never be omitted from a border.

Like a happy temper in adversity is a gleam of color in the garden in the late autumn. One draws a lesson of good cheer from a Calendula, so undaunted and gay even when the snows are falling on its golden head. A cluster of red berries on a dry stem give a distinct joy in early winter, and life is made brighter by the aspect of hardy blossoms and hardier fruit when all the trees around are stripped of foliage.

In summer the charm of a garden is in its coolness and shade, in the dark shelter of thick trees and the quiet of a shaded arbor. In the autumn we seek the sunshine and desire color and warmth, wishing to forget the coming cold and the swift fading of leaf and flower.

It is like the natural clinging of man to life which increases as years steal upon him. Youth does not dread death as age shrinks from it. The habit of living becomes stronger as we descend the hill, and the suggestion of interruption seems impertinent. The late scentless flowers are more precious than the summer Roses, for their time will soon be gone. Nature cheats us with her autumn splendor, which beguiles the mind into forgetting that it is the precursor of decay. While we admire the glory of a Maple-grove, we do not realize that the storms of winter are gathering behind the forest. When the mountains are purple in the low sunlight we forget the snows that shall soon whiten their summits, and there is wisdom in this natural instinct that forbids foreboding when joy is at hand, which can rejoice in the present without seeking to lift the curtain of the future.

Let us rejoice, then, in the autumn flowers; in the soft atmosphere that clothes the world with beauty; in the great moon's yellow light; in the round, soft clouds, and the wild skurry of the dun rack that scuds across the heavens when the breeze rises. Full soon will that searching wind scatter the jewel-like leaves, and tear the last petal from the shrinking flowers, while the grass grows brown and sear, and the soft earth stiffens like a body from which life has departed. Too soon will the valiant head of the last Daisy be buried in a mantle of snow, and the leaden sky bend low above a frozen earth. Let us rejoice, then, while we may, for the days shorten, and with them our summer joys and the lives of the autumn flowers.

We are indebted to Miss Graceanna Lewis for the privilege of publishing the following letter from the venerable President of the Delaware County (Pennsylvania) Forestry Association:

Esteemed Friend,—At thy request I visited the trees of which I spoke at the last forestry meeting, and which I knew sixty years ago. I found them looking very much as they did then, and not very perceptibly larger. The first one is on the farm of John Beeson, in Upper Chichester, near the Baltimore & Philadelphia Railroad, and about half a mile west of Ogden Station. It is a Chestnut-tree, and at three feet high its circumference is twenty-seven feet one inch and a half; at six feet high, it is twenty-four feet five inches in circumference, and one foot from the ground it is thirty feet nine inches in circumference. About one-fourth of the body of the tree is dead up to the limbs, which are about twelve feet high. The top is decaying in many places, but it still measures eighty-seven feet from out to out.

The second one is a Cherry-tree on the farm of George Broomall, about a quarter of a mile south-east of the Chestnut-tree. It is fourteen feet and a tenth in circumference at three feet high, and fourteen feet at six feet high. The top measures seventy-one feet and three-tenths from out to out. This tree is in full bearing, having had a large crop of cherries taken from it this year. I found still enough cherries to remind me of the taste of them sixty years ago. The fruit is natural, quite as large as the Bleeding Heart cherry and quite as sweet, and is black in color. I learn that many trees in the neighborhood have been grafted from it, but it is said that the fruit on the grafted trees is not quite as large as that on the original tree.

The third is a Beech-tree in Lower Chichester, on the Naaman's Creek Road, and it is supposed to mark the place where the circular boundary-line between Pennsylvania and Delaware crosses that road. At three feet high it is fifteen feet and eight-tenths in circumference. It is quite a flourishing tree yet, the top being ninety feet from out to out.

The Cherry and the Beech appear to be good for some years to come. The limbs of the Cherry can be reached from the ground, and I recognized those of them by the aid of which I climbed the tree when a boy. The Beech is covered to the height of convenient reaching with the initials of many persons whom I knew in that neighborhood many years ago.

Thy friend, *John M. Broomall.*

Filices Mexicanæ.—III.

WE continue, this week, the enumeration of the Ferns collected in the states of Nuevo Leon, Jalisco, San Louis Potosí and Machoacan, Mexico, during the seasons of 1888, 1889 and 1890, by Mr. C. G. Pringle, of Charlotte, Vermont, together with notes and descriptions of new species and varieties by Mr. George E. Davenport, of Medford, Massachusetts.

Llavia cordifolia, Lagasca (1990). Shaded rocky cañons, Sierra Madre, near Monterey, July, 1888. Mr. Pringle wrote of this Fern that it was "seen chiefly in a broad cañon of the Sierra Madre near Monterey, through which flowed a brook which had brought down from the mountain and strewn along its borders piles of stones of various sizes. Among these stones this plant found favorite conditions, and grew in great clumps two or three feet high."

Lygodium Mexicanum, Presl. (3318). Low forests, Las Palmas; stems twining ten to twelve feet on shrubs; October, 1890.

Nephrolepis cordifolia, Presl. (1835). Wet cliffs near Gaudalajara, December, 1888.

Nothochlæna Aschenborniana, Klotzsch (3297). Shaded ledges, San Jose Pass, October, 1890.

Nothochlæna aurantiaca, D. C. Eaton (1840 and 2587). Dry shaded ledges and cliffs of the Barranca, October and November, 1888–1889.

Nothochlæna brachypus, J. Smith (1787). Damp shaded banks of gullies and ditches near Guadalajara, November, 1888.

Nothochlæna candida, Hooker (2021). Sierra Madre, near Monterey, June, 1888.

Nothochlæna Lemmoni, D. C. Eaton, var. straminea, n. var. (2830). Rocky hills near Guadalajara, December, 1888. A form with yellowish brown, nearly straw-colored, rounder (more nearly terete), and stouter stipites, and rachises less distinctly channeled than in the type; scales of the rhizoma and stipes lighter colored than in the normal form, and with broader, more membranaceous margins; sori also lighter colored, browner. The whole aspect of the plant strikingly different, especially in color, from the normal form, even as collected in Mexico by Dr. Palmer, and appearing to me worthy of recognition as a good variety. Dr. Palmer's 701, from Chapala, 1886, is identical with this, but shows a nearer approach to the normal form than Mr. Pringle's plant, and the deciduous scales have disappeared altogether from the stipites.

Nothochlæna nivea, Desvaux, var. flava, Hooker (2581). Limestone ledges, mountains near Monterey, June, 1888.

Nothochlæna rigida, *n. sp.* (2599). Root-stock rhizomataceous, moderately stout, clothed with dark brownish black opaque scales; stipites stout, rigid, approximate, 3′ to 4′ long, and, as well as the main rachis, terete, dark chestnut-brown, dull-polished, sparsely clothed from the base upward with dark brown opaque scales and a deciduous white powder; laminæ 8′ to 12′, or more, long, 2′ to 3′ broad, only once really pinnate, but appearing as if bipinnate, long-lanceolate, broadest in the middle, with upward of twenty or more pairs of sessile pinnæ; pinnæ acuminate-lanceolate, deeply cut almost to the rachises into 8 to 12 linear, pinnatifid, obtuse divisions on each side, those on the lower side much the longest, lowermost pinnæ gradually reduced; upper surface naked, under thickly coated with white powder; sori light brown; margins slightly recurved.

Habitat: Limestone ledges, Sierra de la Silla, Monterey, May 31st, 1889. This fine new Nothochlæna bears some resemblance to *N. Lemmoni*, and some of the smaller specimens might easily be mistaken for that species; it is, however, a much coarser plant, with more compound fronds and a more rigid habit. Professor Eaton, whose kindly assistance is continually placing me under obligations which I take pleasure in acknowledging, observes, also, that the slightly revolute margins indicate a much closer approach to Cheilanthes than in the case of *N. Lemmoni*, to which I would add that there is about this Fern also, as distinguished from *N. Lemmoni*, that indescribable atmosphere, or feeling, which oftentimes enables one to distinguish one Fern from another by the mere handling. The illustration on page 521 is from a drawing by Mr. C. E. Faxon.

Nothochlæna Schaffneri, Underwood (in litt.), var. Mexicana (*N. Nealleyi*, Seaton, var. *Mexicana*, Davenport, in *Botanical Gazette*, February, 1891). Dry, shaded ledges of the Barranca, November, 1888. No. 1864. Fronds larger, more rigid and more compound than in the type. Dr. Palmer's 555, from the cañon of Rio Blanco, September, 1886, belongs here,

and I suspect Schaffner's 962, from the San Rafael Mountains, does also.

[Note.—Since the publication of my note on Pringle's No. 1864, and *Nothochlæna Nealleyi* in *Botanical Gazette* (l. c.), Professor Underwood has identified the latter Fern as Fournier's *Aleuritopteris Schaffneri*, and having personally examined and compared Schaffner's specimens from his herbarium with the specimens of *N. Nealleyi*, now in my possession from Mr. Seaton, I can vouch for the accuracy of his determination. There can be no question as to the identity, and as Fournier's species was published and described in 1880 (Bull. Bot. Soc. de France, xxvii., p. 328) from specimens collected by Schaffner in the mountains of San Miguel, in September, 1876, it necessarily supersedes and retires Mr. Seaton's *N. Nealleyi*. Schaffner's specimens, as well as those from Mr. Nealley's later collection, show that the species, like nearly all of its congeners, has the stipites, rachises and sori *brownish* as well as *blackish*, and that the frond becomes bipinnate.]

Holiday Notes from Switzerland.—I.

THE latter half of July and the beginning of August of the current year were spent by Mr. Bean, one of my Kew colleagues, and myself in Switzerland, and we remained in the open air by far the greater part of every day. A large number of species was seen by us, and the following notes may be of interest to those readers of Garden and Forest who cultivate some of the beautiful herbaceous and alpine plants we noted, but who may not have had an opportunity of seeing them amid their natural surroundings. We took the steamer at Lucerne for Fluelen—the port of the canton of Uri—and enjoyed to the full the glorious scenery, which, according to many travelers, is unsurpassed in Switzerland, and even in Europe, for magnificence. The beautiful banks are also intimately associated with those historical events and traditions which are so graphically depicted by Schiller, in his William Tell. From Fluelen we took train to Göschenen, and then began our walking tour through Andermatt and Hospenthal to Tiefenbach, thence over the Furka Pass to the Rhone Glacier and afterward down the Rhone Valley to Sierre. From the last-named town we turned up the Val d'Anniviers to Vissoye and then ascended to the Hotel Weisshorn, built at an elevation of about 7,550 feet above sea-level, on the Tetaz-Fayaz, or Sheep's Head. Here we stayed a week, and in that time had not nearly exhausted the district when we were compelled to return to duty.

Shortly after leaving the station at Göschenen (3,640 feet) we entered the sombre rocky defile of the Schöllenen, bounded by lofty and almost perpendicular granite rocks, at the base of which dashes the Reuss. Before arriving at the Devil's Bridge we noticed large sheets of *Astrantia minor* on the flat rocky ledges by the road-side; this is a charming plant; the umbels are about half the size of those of *A. major*, and, like that species, it is thoroughly deserving of a place in any rockery or herbaceous border. Strange to say, however, it is very rare in cultivation in Britain, and might be inquired for in vain in most establishments, even where alpine and herbaceous plants are grown for sale in enormous quantities, both as regards number of species and individuals. In the crevices of steep rocks *Saxifraga Cotyledon*, with its dense rosettes of grayish green leaves surmounted by graceful waving panicles of white flowers, was certainly both conspicuous and beautiful enough to satisfy even the most exacting; in some parts of Switzerland, notably at Locarno, this species is so plentiful that its panicles, together with the flowers of *Lilium bulbiferum*, are used in the decoration of the temporary altars which are erected at the street-corners on the occasion of the feast of Corpus Christi. For this fact, as well as for information as to the distribution of Swiss plants, I am indebted to the classical work of Dr. H. Christ, "La Flore de la Suisse et ses Origines." Let me add, by the way, that botanical and horticultural readers of Garden and Forest who contemplate a Swiss tour should peruse this book before starting, and also take it with them for reference. The Turk's Cap Lily (*L. Martagon*) was also seen growing among the sparse brush-wood on the steep slopes; in several English counties this species is known by the rather droll name, "Turn again Gentleman." Under similar conditions a yellow Foxglove (*Digitalis lutea*) was seen. The three last-named plants, however, were seen after passing the Devil's Bridge, which, by the way, was "ornamented" by a staring advertisement painted in large letters on the surface of the smooth perpendicular rock, and by a rude picture, a conventional representation of his Satanic majesty watching with dismay the first living thing—a hungry dog—which crossed the bridge, just then completed by the pious Abbot Giraldus, of Einsiedel, for the convenience of pilgrims on their way to Rome. Every one is familiar with the way in which the devil was cheated on this occasion, for is not the tradition made use of by Longfellow in his "Golden Legend"?

Before reaching the Urseren Valley a fine Dianthus was collected on hot dry banks; under similar conditions *Cerastium arvense* was seen, forming dense snowy sheets of blossom. Wonderfully differing in aspect from the wild region already traversed is the above-named valley, with its fertile green pastures watered by the Reuss; it is about eight miles long and is surrounded by lofty and barren, partially snow-clad, mountains. Here winter lasts nearly eight months, and fires are often necessary during the short summer. Along the numerous water-courses *Ranunculus aconitifolius* grows in abundance; the double-flowered state of this species—which is so frequently met with in old-fashioned country gardens—is known in England under the pretty name of "Fair Maids of France." The Snake-root, *Polygonum Bistorta*, was seen in such profusion as to color the entire meadows, and this, together with *Campanula rhomboidalis*, produced such color-effects as are, perhaps, not to be seen away from an alpine meadow. The intensely bright sunlight makes up somewhat for the short summer, and the plants bear flowers deeper and richer in color than do the same species under cultivation in Britain. The tuberous roots of the Polygonum are astringent and contain a considerable proportion of starch; they were formerly much used in medicine, and are still highly esteemed by the rustic herbalist; in some countries they are turned to account as food during famine-times. At Andermatt, the principal village of the valley, prevails a curious custom which also obtains in some other parts of Switzerland; the charnel-house attached to the church is adorned with skulls bearing inscriptions, "On the occasional opening of the graves the skulls are conveyed by the relatives of the deceased to the charnel-house, where they are kept in symmetrical piles." Between Andermatt and Hospenthal, in the small patches of rye, *Delphinium consolida*—the parent of some of our races of cultivated annual Larkspurs—occurred as a weed, as well as another fine blue-flowered plant, the Viper's Bugloss (*Echium vulgare*), a biennial which, if cultivated in rich garden ground, increases wonderfully in size and vigor, but, on the other hand, really loses much of its beauty. From Kealp onward many characteristic alpine plants began to be conspicuous in the steep pastures. One of the most charming was *Campanula barbata*, a beautiful Bell-flower, from three to twelve inches in height, with large pendulous bearded corollas, varying in color from white, through pale porcelain blue, to deep blue. *Veratrum album*, the so-called White Hellebore, was perhaps more striking as a foliage plant than by reason of its tall panicles of greenish flowers. *Gentiana purpurea*, about a foot in height, with a terminal cluster of large red-purple flowers, was in full blossom here at an elevation of about 5,500 feet; much later on, about 1,500 feet higher, we only found it in bud.

Royal Gardens, Kew. *George Nicholson.*

New or Little-known Plants.

Dendrobium Phalænopsis.

THIS is the most beautiful of all the Dendrobiums hitherto introduced from northern Queensland and the adjacent islands. It was discovered at Cape York, on the extreme north of Queensland, by a Captain Broomfield, who introduced living plants of it into his garden in Balmain, Queensland. Here it flowered, and was figured by Fitzgerald in his folio work on Australian Orchids. He also sent a description of it to the *Gardeners' Chronicle* for July, 1880. His figure represents a plant with pseudo-bulbs eighteen inches long, terminal, erect racemes, produced from the matured pseudo-bulb, the longest raceme being one and a half feet long and bearing ten flowers and buds. The flowers measure two and a half inches across, and they are described as being lilac in color, with a few small dark calli on the disk of the labellum, and two white glands at the base of the column. There is a family likeness between *D. Phalænopsis* and *D. bigibbum*, *D. superbiens* and *D. Goldiei*, but, as Fitzgerald points out, the first-named is easily distinguished from these three in the form of its flowers and the shape of the labellum. The name *D. Phalænopsis* was given by Fitzgerald from the likeness of its flowers to moths as well as to those of the genus Phalæ-

nopsis. The plant in Captain Broomfield's collection flowered the following April, and produced 300 blooms.

In 1882 Mr. Forbes visited some of the islands north of Queensland on behalf of the Geographical Society of London. He brought back with him several living plants, and among them was a plant of this Dendrobium which he obtained in Timorlant. This plant came to Kew, where it flowered in September, 1884, and a figure of it was published in the *Botanical Magazine*, t. 6817. There is a decided difference between the plant flowered at Kew and that figured and described by Fitzgerald, the scape of the latter being erect, while that borne by the Kew plant was pendent; the lip of the latter was maroon-crimson, whereas Fitzgerald figures and describes his plant with uniformly lilac-purple flowers. However, Sir Joseph Hooker considered and described them as identical. Several plants of *D. Phalænopsis* had been distributed from Kew, and these are now known as the Kew variety to distinguish them from an exceedingly beautiful form of the same species. This was named *D. Phalænopsis*, var. *Schrœderianum*, by Reichenbach in compliment to Baron Schrœder, in whose collection it first flowered at Egham, near Windsor.

Fig. 80.—Nothochlæna rigida, n. sp.—See page 519.

He procured it from Messrs. Veitch & Sons, who had imported several plants of it through the Rev. Mr. Macfarlane, a missionary in north Australia. Mr. Lee, of Leatherhead, also obtained a plant from Veitch, who bought it back again for fifty guineas when Mr. Lee's plants were disposed of by auction. This plant also went into the collection of Baron Schrœder, who is now the sole possessor of the variety. This is certainly a very beautiful Dendrobe. There is a figure of it in *Williams' Orchid Album*, iv., t. 187. It has flowers half as large again as the Kew variety, and the color is much deeper and richer.

Until this week *D. Phalænopsis* was coveted by all who had seen it as exhibited in flower last spring, but Mr. Sander has lately imported a large quantity of what he declares to be the same as Baron Schrœder's variety, and has disposed of nearly a thousand plants by auction sale to-day.

The plants were in very good condition, many of them having young growing shoots. Some of them had pseudo-bulbs over three feet long, one I measured being forty-three inches, and as thick as a man's thumb. Others had thinner and shorter pseudo-bulbs, and were more like what we had hitherto known as *D. Phalænopsis*. Altogether, there was very considerable variation in the length, thickness, shape and color of the pseudo-bulbs on the plants sold to-day. I noticed, too, that the old flower-scapes were nearly all erect; certainly not one was what might be called pendent. If these plants are really *D. Phalænopsis*, then it is a very variable species. Some of the dried scapes exhibited were nearly three feet long, and bore scars of twenty flowers. Dried flowers were also on view, and they were nearly four inches across. Mr. Sander says that there are varieties with white, rose and crimson, as well as purple flowers, among those sold to-day.

Where these plants were collected has not been divulged, but it is probable that their home is not far from New Guinea. Mr. Sander publishes in his sale-catalogue a letter from the collector who sent home the Dendrobiums, which is interesting enough to quote in full. It is headed "The King of Dendrobes." The collector writes:

"With great pleasure I announce to you the fact that I arrived here yesterday with my plants in the finest order, and you will at last get striking novelties from this terrible country. It was the best time to collect the Dendrobe; they had just finished growing, and some were in full bloom. I forgot all my troubles when I saw the first on some rocks, on the

bare limestone between a great number of human skulls and bones. The natives do not bury their dead, but put them in a kind of coffin and then place them on these solitary rocks, which stand scattered about the shore or beach, and which can be reached or got at only at ebb tide. Here in these rocks the plants grow most luxuriantly, exposed to the full sun, and when the weather is rough they often get the spray of the sea-water. At first the natives did not like the idea of collecting the plants; they were afraid the souls of the departed, whose bones were lying there bleaching in the sun, would resent it, but when they saw the gorgeous handkerchiefs, beads, looking-glasses, and brass wire I offered them for the plants, they did not trouble themselves any more about the souls of their ancestors, but boldly went and rooted out every plant to be found. The plants grow chiefly on these solitary, much-honeycombed limestone rocks, always exposed to the sun or getting only very little shade during a part of the day. They also grow on trees in the Ficus-groves more inland, although very sparingly. I found the big specimens on the highest trees in the dense jungle, where they are very rare, and I only saw a few on the very highest trees. I should think in cultivation these plants will require plenty of moisture while growing, and a culture like that of *D. nobile*.

"In size and coloring it varies as much from the ordinary *D. Phalænopsis* as *D. Wardianum* from *D. crassinode;* the largest flowers measured four and a half inches across, none measuring less than three and a half inches. I saw a few plants with branched spikes, but this seems only excess of strength; the spikes are generally from twenty to thirty-five inches long; on some I counted up to twenty-five flowers; the color is very variable, ranging from pure white to dark purple-red, and some are differently colored and variegated, but bright and clear; the flowers last a long time, individually eight weeks. During my stay of three months I saw many plants in flower in April, May and June. A Dutch trader, one of our party, who has been here twice, says that he has seen it in flower in July, August and September. It is, without doubt, the finest Dendrobe in existence, and a gorgeous Orchid."

The sale was a most successful one, the prices fetched by the majority of the plants ranging from twenty to two guineas. Mr. Sander estimated that the seven hundred and odd lots had realized about £2,000.

D. Phalænopsis requires plenty of heat, sunshine and moisture; far more than suffices for *D. nobile*. In this respect it does not differ from its near relatives, *D. superbiens* and *D. bigibbum*. The flowering of the plants of this new importation will be awaited with some interest. At present I am inclined to believe that *D. Phalænopsis* as figured and described by Fitzgerald is not the same species as that figured in the *Botanical Magazine* under the same name, and also that Mr. Sander's plants are likely to include both these, besides, probably, other forms.

Kew. *W. Watson.*

Foreign Correspondence.

London Letter.

Conifers, Asters and Sunflowers.—An exhibition and conference devoted to these three classes of plants, and extending over nearly a week, has been the special horticultural feature of the present month. The Royal Horticultural Society had invited growers of these plants in all parts of the United Kingdom to send specimens, photographs and pictures of them to Chiswick for purposes of comparison and observation. The exhibition which resulted might almost have been styled an American one, all the Asters and Sunflowers, and the majority of the conifers shown being introductions from your country. The actual number of specimens, especially of Coniferæ, was so large that the extensive space provided for them was not nearly sufficient to admit of their being set out so as to be seen to proper advantage. From Kew alone specimens of conifers representing over five hundred distinct species and varieties were sent, and the trade dealers in these plants, besides the principal private growers, were equally generous in their contributions of specimens and plants.

Papers were read by scientists specially interested in the plants exhibited, as well as by cultivators, and the amount of valuable information thus brought together was very great. Dr. Masters, Professor Marshall Ward, Mr. G. Nicholson, Mr. Malcolm Dunn, Mr. H. Veitch and several others read papers dealing with Coniferæ in their various aspects. The paper by Dr. Masters was botanical and historical. Professor Ward devoted himself to a popular description and account of the diseases, fungal and other, which attack coniferous plants. This paper, or rather a resumé of it, was listened to with great interest, and its appearance in the journal of the society will be welcomed by all who are concerned in the management of these plants. Mr. Nicholson pointed out some of the most effective kinds for use in landscape-gardening; Mr. Dunn, dealing partly with the same subject and partly with the economic value of some conifers, alluded specially to *Abies Albertiana*, *A. concolor*, *A. Douglasi*, *A. grandis*, *A. magnifica*, *A. Nordmanniana*, *Cupressus macrocarpa*, *C. Lawsoniana*, *C. Nutkænsis*, the Larch and *Thuia gigantea*. These he placed in the first rank as trees likely to prove important in England, either for timber or other valuable uses. Mr. Dunn has charge of the gardens and forests at Dalkeith, in Scotland, where conifers are exceptionally well grown. Mr. Thiselton-Dyer spoke of the beauty and perfection of the large number of these trees cultivated in Scotland, and suggested that their vigorous health, as compared with what is seen further south, is accounted for by the conditions of climate and of atmosphere in the north, which are not to be met with in the southern part of the kingdom.

There is a growing opinion among English landscape-gardeners that conifers are far too lavishly and recklessly used in the making of gardens here. They are supposed to be the right thing and are consequently planted in all kinds of gardens, in many of which the conditions essential to the health of conifers are not possible. A healthy Pine, or Fir, or Cypress is pleasant to look at almost anywhere, but such plants, when in bad health, are the most wretched-looking of all trees. We are apt to overdo the evergreens. No less an authority than Richard Jefferies raised his voice against the "foreign evergreens" being allowed to crowd out almost entirely the native and other deciduous trees. "Let the Cedar and the Laurel," he wrote, "and the whole host of invading evergreens be put aside by themselves, in a separate and detached shrubbery, maintained for the purpose of exhibiting strange growths." It is intended to publish in the journal of the Royal Horticultural Society a list of all the kinds exhibited, with their correct names and synonymy; and, as far as possible, the conditions under which the best examples are grown. The most suitable kinds to plant in the garden, the shrubbery or the park will also be tabulated.

The Asters were exhibited in considerable quantity and formed a striking feature of the show. Papers upon them were contributed by Professor Goodale, of Harvard, and Mr. C. Wolley Dod, the former being devoted to the botanical features and geographical distribution of the genus, with a general review of Professor Asa Gray's latest writings on American Asters. Mr. Dod dealt chiefly with the culture, selection and cross-breeding of Asters, with a view to improving them in habit, size of flower and variety of color.

Asters are features in the gardens at Kew in September and October. They are planted in large beds or singly in shrubberies, and even in the rock-gardens, as well as in the beds devoted to a collection of hardy *Compositæ*. Nothing could be more effective than large masses of such species as *A. amellus*, *A. acris*, *A. Novi-Belgi* and *A. Novæ-Angliæ*. A white-flowered seedling named Harper Crewe is much admired.

The Sunflowers (Helianthus) had two papers devoted to them—one by Mr. D. Dewar, of Kew, who dealt with the botany and history of cultivated Helianthi; the other by Mr. E. H. Jenkins, who discussed their cultivation. Mr. Dewar's paper is so interesting that I will defer my remarks upon it for another occasion. The necessity for replanting frequently and manuring heavily for all the Sunflowers was emphasized by Mr. Jenkins, for, although they will grow in the poorest soil, they amply repay liberal treatment. He stated that it is possible to reduce the height of the tall-growing sorts by cutting back the stems to within about six inches of the soil early in June. In this manner Mr. Jenkins has reduced the height of the tallest to three feet. Those who object to many of these plants in small gardens because of their height should try Mr. Jenkins' plan for lowering them.

Kew. *W. Watson.*

Fig. 81.—The California Buckeye (*Æsculus Californica*).—See page 517.

Cultural Department.

The Present Status of Native Plum Culture.

THE dearth of hardy fruits in the north-west is naturally directing attention to the native Plum. In the northern species of this fruit, the *Prunus Americana*, is found a tree that, when properly grown, needs not fear frozen mercury or the brightest summer or winter suns, and that suffers comparatively little from fungal diseases. The pioneers of the north-western states, in common with those of the east, generally regarded the native Plum as of too little value for culture. But when sad experience at length demonstrated that the finer European Plums are unable to endure the severe climatic conditions of these states, the better native Plums were found far preferable to none, and the thickets where this fruit still abounded began to receive protection. Occasionally a specially meritorious tree, or clump of trees—for their suckering tendency often caused the trees to grow in clumps—was honored with a removal to the farmer's yard or garden, and thus the good work of selection was almost unconsciously commenced.

As the real merits of this fruit begun to appear, the more progressive farmers, and especially those whose tastes inclined in the direction of horticulture, begun to espouse its cause in earnest. Mr. J. S. Stickney, of Wauwatosa, Wisconsin, in an address before the Iowa Horticultural Society in 1877, said: "I am dreaming that in these native Plums there is something valuable. Their endurance, productiveness and perfect hardiness should and must be made useful to us, and we have no right to rest or flag in our efforts until we have an orchard of native Plums that shall command in market two to four dollars per bushel, and yield crops as abundant and frequent as the wild ones in our thickets now do. About the possibility of this there is very little doubt." This was written but fourteen years ago, and it seems well to add that this result has already been attained. During a visit to Mr. O. M. Lord, of Minnesota City, Minnesota, early in September last, I saw plums sold from his native plum-orchard at sixty-five cents for the ordinary peach-basket, holding about a peck, while the common native plums, gathered indiscriminately from the wild thickets, were selling at from forty to sixty cents per bushel.

What can be said of the quality of the best native plums? This question involves some difficulty, since doubts have been raised regarding the parentage of some of the finer varieties. If the Cheney, Gaylord and Rollingstone plums are pure natives, the gulf between our finest native varieties and the Green Gage or Jefferson is not so great that we need to despair of filling it. It must be confessed that the average wild plum, with its diminutive size and tough acerb skin, would not make a creditable showing by the side of its more cultivated European cousins, but in the Gaylord and Cheney we have size that eclipses the Green Gage, a thin and fairly tender skin, with but the merest trace of acerbity, and with a flesh that for luscious juiciness would suffer little in comparison with the finest European sorts. In the Rollingstone we have a plum of a size equaling the Green Gage, of delicious quality, with a skin which, though rather thick and tough, is without acerbity, and parts readily from the pulp. The fruit has been shipped from Minnesota City to St. Louis and to New Jersey, arriving in excellent condition. The tree is very hardy and productive, and at Minnesota City is said to have missed but two crops in thirty-five years. Some of the finer varieties tend to rot under culture more than in their native state, though I do not know that the tendency to this trouble is greater among the native than the European sorts.

Professor Budd suspects that most of the larger so-called native Plums that have recently been brought to notice in Iowa and Minnesota may be hybrids between *Prunus Americana* and

P. angustifolia, resulting from pits of the latter species having been brought by the Indians from the south or south-westward. If this is true, it would seem that we have discovered a key to the improvement of the former species, for these hybrids, if hybrids they are, manifest a very satisfactory degree of hardiness. The varieties derived from *P. angustifolia* have not thus far proved hardy in Minnesota or Wisconsin.

The soil-requirements of the native Plum appear to vary much with different sorts. Varieties that succeed well on a sandy soil may prove worthless on clay, and vice versa. This often explains the discordant and even contradictory reports so often read regarding the value of certain varieties. The sorts that succeed best at Mr. Lord's place, which is on fine alluvial sand, are not, as a rule, the ones that have proved most successful with Professor Budd at Ames, Iowa, where the soil contains more clay. A few varieties, however, like the De Soto, appear successful in nearly all localities.

The susceptibility of the native Plum to injury from the Plum curculio has been the subject of some dispute. It may be safely said that the native Plums possess no immunity from attack by this destructive insect. It appears, however, that the proportion of larvæ that develop is much smaller in most native varieties than in the varieties of the European Plum. How far this is due to the thicker skin of the native species it is difficult to say. The idea that the native Plum requires no protection against the curculio is erroneous. The proportion of fruit that is destroyed by this insect, even on nearly worthless wild varieties, is often very large. Few precautions seem to be taken at present to hinder the work of the curculio by those who grow native Plums, but I think the time is not far distant when some protection will be regarded as a necessity by the growers of the finer varieties.

It is generally conceded that productiveness in the native Plums is promoted by the intermingling of the trees of different varieties. Certain varieties appear nearly incapable of fertilizing their own flowers, while others, as the De Soto, seem specially adapted to serve as fertilizers. It is possible that much is yet to be learned upon this point, and that the complaint of unproductiveness in the native Plum may often arise from an unfortunate combination of varieties.

The production of the finer native Plums on a commercial scale is as yet in its infancy, but promises rapid development. The planting of some of the recently introduced varieties is now being delayed only by the limits of propagation. The first orchard of native Plums started with reference to selling the product, appears to have been that of Mr. Lord, of Minnesota City, which is now about twenty years old. The number of such orchards at the present time is not large, but is increasing.

Some difficulty is experienced in propagating the native Plum under north-western conditions. The stocks used for the European Plum are not satisfactory, and, so far as fully tested, only the native Plum itself is best adapted for its own stock. The seedlings of pure natives are rather difficult to obtain, the demand for them at present exceeding the supply. The pits are not a commercial commodity, and must be picked up, usually in small lots, and they are not very reliable for germination. Budding in our hot summers is a precarious operation, and the keeping of cions and root-grafts is attended with some difficulty by those who have not yet learned the secret. Even top-grafting in our fickle spring weather is somewhat uncertain. But these difficulties will doubtless disappear before the knowledge developed by careful experiments.

University of Wisconsin. *E. S. Goff.*

Roses.

THE much-dreaded "black-spot" often makes its appearance on Roses under glass the latter part of September or early in October, and while in some instances this disease seems hard to account for, in a majority of cases it is caused by an excess of moisture, either at the roots or in the atmosphere. All syringing or watering should be done early in the day, so that the atmosphere may not be saturated with moisture at night, for if the foliage of the Roses shows beads of moisture in the morning it is evident that the house is too damp or too cold, or both, and as a result a visitation of "black-spot" may be looked for. A solution of sulphate of copper has been used for this fungus by some growers with a certain degree of success; in fact, a bench of La France Roses, on which an experiment with copper solution had been tried, showed a marked difference when compared with an equal portion of the bench on which the plants had not been sprayed.

It may be advisable, when experimenting with this solution, to keep the liquid off the soil as much as possible, as Mr. A. W. Pearson has pointed out in a recent issue of Garden and Forest, for his experiments certainly seem to demonstrate that the copper has an injurious effect on the soil when used out-of-doors. A similar result is quite possible with Roses under glass, though I do not know of any such instance. It is best to remove all decayed leaves, especially if affected with "black-spot" or mildew, and to burn them at once. Cleanliness is essential to the highest cultivation of most plants, and to none more so than to Roses. The first crop is the hardest to manage, and strong, well-ripened plants should be selected and every possible advantage given them.

For early crops of hybrids in pots it is necessary to start plants into growth at once, as at least twelve weeks will be required to bring them into bloom. In the matter of heat much care is needed to secure early hybrid flowers. When given too much heat in the first stages of growth the shoots are likely to prove blind, and though these blind growths sometimes make another start later in the season, and then produce flowers, this hardly repays for the loss of time and space in the first place. The better plan is to start Hybrid Roses with but little heat, and gradually increase the temperature up to fifty-six degrees as the growth advances. A stimulant in the form of liquid manure should be given as the root-action increases, care being taken not to sour the soil by injudicious use of the latter. After the holidays it is much easier to force hybrids into bloom, and while care is at all times essential if fine flowers are desired, the plants are less impatient of any slight omission when the processes of nature are less hurried.

In the selection of early varieties Heinrich Schultheis should not be omitted, this being one of the best early pink Roses, though closely followed in good qualities by the old favorite, Anna de Diesbach, and also by Anna Alexieff. In the same class are the standard sorts, Ulrich Brunner, Mrs. John Laing, Madame Luizet and Magna Charta.

The propagation of Tea Roses for next year's stock will soon demand attention, and where the stock-plants are limited in number it is best to begin the work early in the season by putting in successive lots of cuttings as the wood can be spared. This is not the only consideration in the matter, for there is also a decided advantage in having strong and sturdy plants in readiness for early planting the following summer.

Still another sport from Perle des Jardins has been sent out during the year, and being of Canadian origin has been named Toronto. It is claimed to be superior to its parent in all respects, though of similar type.

Holmesburg, Pa. *W. H. Taplin.*

Pot-plants for Spring Use.

IN addition to the commonly grown *Deutzia gracilis*, *Astilbe Japonica* and a few other shrubs and herbaceous plants which are forced for spring use, and generally put in tubs or pots, and stored in pits until required, there are several which may be added with advantage. The common Foxglove (*Digitalis purpurea*), in purple and white varieties, makes an excellent plant for piazza decoration. Good strong plants, potted now and placed in a cool pit, come along with scarcely any fire heat and bloom by the 1st of May, at which season, in this latitude, it is scarcely safe to expose more valuable forced plants, such as Roses, fancy Pelargoniums, and the like. The common Canterbury Bell is another equally good plant, and is just a little later than the Foxglove. Last year I experimented with quite a number of dwarf-growing hardy plants, with a view to testing their value for early forcing, with poor success. Many were very pretty, but the great objection is their poor lasting qualities. A few, however, were added, which may be considered useful, mainly on account of dwarf habit and unique color. Among these are the Swiss Bugloss (*Ajuga Genevensis*), which produces numerous dense spikes of intense indigo blue flowers, which last a long time. Another is the comparatively new and pretty Mexican Alum-root (*Heuchera sanguinea*). This plant, in addition to handsome foliage, a characteristic of the genus, and for which reason alone many of the species are grown, produces spikes fifteen to eighteen inches long, of fair-sized magenta-red flowers. *Brunella Webbiana*, a very handsome species, has violet-purple flowers of good lasting qualities. The main objection to this is the fact that an inferior, yet bright and free-flowering species is a common weed everywhere.

English hybrid Primroses are becoming as generally grown for market purposes as Violets. They are sure to become popular, and remain so. Their flowers are produced in great abundance during February and March under the same treatment given to Violets, and are of decided colors and fragrant. Clear yellow is the favorite color now, but good crimsons and whites will be in demand. No two more beautiful colors could be associated in a bouquet than Primroses and Forget-me-nots, nor are there two names more full of sentiment. It

can be said of these, as of the Rose, that the name gives more than half the charm.

Every autumn we place on the steps leading to the front entrance, and also in the recesses around the door, a dozen more pot-plants of the Japanese Anemone (*A. Japonica alba* and *A. Japonica hybrida*). No plant has proved so useful, being far superior to the early Chrysanthemums for this purpose. While it is not a Chrysanthemum, it is yet a Japanese plant, and so comes as a natural, and happily chosen, forerunner to the queen of autumn. Although I have before referred to its culture for this purpose, a brief account of the treatment is given here. I usually shake the soil off the old crowns, and if too large reduce them; then repot in good heavy loam Toward the blooming-season a little liquid manure is given. If starting with fresh stock about five crowns should be put in a ten-inch pot; this is a quicker way of producing a specimen than potting singly and waiting for them to grow large enough. We store the plants in a barn cellar, and keep them moderately, but not dust dry until March, when they are brought out and treated as already stated.

The latest blooms picked in the open are from the Perfection Violets. The value of Violets over Pansies is their perpetual blooming habit. We have here only two varieties, but in England, and particularly in Scotland, a specialty is made of them, and many varieties are catalogued, representing several shades of color. They are used for spring bedding, and either in lines or masses are very effective. The severity of the American climate is against their use in the way practiced in Scotland. Here we have to rely almost solely on seed for our stock, and this is against perpetuating any required variety true to color. There the cuttings are taken in late autumn, dibbled in "cradles" in the open, with the protection only of a few leaves or Russian mats in very severe weather, and the rooting is made mostly during the winter.

Another interesting late-blooming plant is *Veronica longifolia*, var. *subsessilis*. I think it would make a good pot-plant, and intend to try it during the coming season. It is a remarkably robust and distinct variety with long spikes of deep blue flowers.

Wellesley, Mass. *T. D. Hatfield.*

Notes from the Harvard Botanic Garden.

Asters in October.—In Garden and Forest, vol. iii., p. 552, attention was called to *A. Shortii*, *A. Tartaricus* and *A. turbinellus*, good late-flowering Asters. These three species have again proved to be effective, reliable and the last to bloom. The group may be extended, however, by the addition of *A. diffusus* and *A. multiflorus*. Both of these plants were still in full flower about the middle of October, and they are valuable in giving a greater range of color to the later representatives of the genus than that afforded by the flowers of the first selection of species. *A. diffusus* attains a height of about four feet, and is very profuse in the production of branches. The leaves are lanceolate; the flowers are small, half an inch in diameter, and exceedingly numerous, and the ray-florets white, with reddish purple disk. These dense masses of flowers are very effective. The plant is of erect, yet graceful habit, and quite common in its wild state. *A. multiflorus* is also common, and from three to four feet high. The stems under cultivation are so top-heavy that support is necessary to keep them in an erect position. The leaves are small, linear, and arranged very closely on the stems and branches. The flowers are white, with yellowish disk; in size somewhat inferior to those of *A. diffusus*, and packed upon the branches in enormous quantity. *A. turbinellus* is undoubtedly the best October Aster, and while *A. Tartaricus* is not so attractive, it is still much to be desired on account of the display it affords in October and November, when all other Asters, and almost all other flowers, are past blooming. The third place in order of merit might be equally divided between *A. Shortii* and *A. diffusus* with perfect justice to each, and admitting that the flowers of the former last the longer. But having already a blue-flowered variety in *A. turbinellus*, *A. Shortii* will be discarded in favor of *A. diffusus* where it is desirable to curtail the number of species.

Bocconia cordata.—To say that this plant is an ally of the Poppy, requires a botanist's knowledge. Its stately growth and insignificant flowers would certainly not convey that information to those who inquire into the mysteries of plant-life no further than is necessary to secure pleasing contrasts in the garden or bring grist to the mill by some of the many ways, direct and indirect, in which plants contribute to the comforts and necessities of mankind. This Poppy, while not like the oriental Poppy, conspicuous at a distance, has attractions which are still worthy of notice. It is a plant of large growth, averaging seven feet in height. The slightly branched stems are erect, well furnished with large cordate and freely lobed leaves (bright green above and glaucous beneath), and terminate with very large panicles of pinkish white flowers. The number of the flowers, arranged closely together in great clusters, rather than their individual beauty, characterize this variety. *B. cordata* is a perfectly hardy herbaceous perennial, and when thoroughly established rapidly forms compact masses of handsome contour. The flowers develop in August and September, and the stems retain all their leaves until hard frost makes its appearance. These qualities render the plant very desirable, as it is most effective in large clumps on the greensward. *B. cordata* is not particular as to soil, but the growth gains strength in proportion with the increase of richness and depth. The plant is a native of China. It was introduced into England by Sir George Staunton in 1795, and is readily propagated by division.

Silphium laciniatum, var.—The common Compass Plant (*S. laciniatum*) is perhaps the most popular and most generally cultivated species of the genus. It is a plant about six feet high, producing its starry yellow blooms on the upper portion of the stems with much freedom during July and August. The radical leaves are of oval outline, flat, parted, laciniate, from one to three feet long, the petiole occupying two-thirds of their length. They form a thick cluster from which proceed the stems, sparingly clothed with much smaller leaves. It is of bold aspect, as are all the species, and suitable for positions requiring massive rather than graceful or pretty subjects. There is one specimen of a supposed variety flourishing here which differs from this species in several important particulars. The leaves are not flat, but somewhat sulcate, and the segments are waved and twisted to a considerable degree. The stems are from eight to ten feet high and are thickly set with small leaves. The flowers measure three inches in diameter, and are of a paler yellow color than those of the species, while they appear only during September and October. This plant has been in cultivation here for many years, but its origin does not appear to be known to any one. There may not be any strongly marked botanical difference between it and the species, as most competent authorities aver; but when viewed from the gardener's standpoint the dissimilarity assumes importance. The difference in the leaves, the height, and, most important of all, the flowering season distinguish it from the type. All other Silphiums are far past their period of brilliancy when this form of *S. laciniatum* expands its first blossoms. This fact in itself will be sufficient to stimulate inquiry relative to the existence of other specimens exhibiting the same characters; and if such plants are to be found, any information that can be gained about them would be interesting, not to say useful. It is hardly likely that any similar variation of the species, which may exist in gardens, can claim the specimen in question as its parent, for it flowers so late in the season that seeds never ripen.

Cambridge, Mass. *M. Barker.*

The Cranberry Scald.—In a recent visit to a large Cranberry-bog it was found that the scald had taken more than one-third of the crop, and from the appearance of the berries in the crates stored in the capacious cellar it seems probable that the second third will decay before the crop finds its way to the Thanksgiving market. There is no doubt that the scald is assuming an alarming form, and should it increase for the next ten years as it has in the past, there will be no profit from the bogs. The first thought is to put some substance upon the vines to ward off the enemy, as Paris green is used to destroy the curculio and the codling moth, and Bordeaux mixture the black rot of the Grape, which, by the way, is not very different from the scald of the Cranberry. There is no question about the Cranberry trouble being caused by a fungus, or that it is in all parts of the plant, leaf, stem and root as well as fruit. It does not come from the outside, as a rule, and that it is due to the scalding effect of the sun has no foundation in demonstrated fact. It is no easy matter to apply a fungicide to a bog so that it will effectively check the scald. An experiment embracing no less than ten substances, all standard fungicides, upon forty plots, during last year, gave only negative results. While, therefore, it may be possible to reach the enemy in this way, success is not probable, and some other method should be looked for. Let it be remembered that the Jersey bogs are largely muck-bogs, especially where the scald is worst. In other states, and where there is no such trouble, the plants are grown in sand.

While the Cranberry-plant is fond of moisture, it does not follow that impure and stagnant water is as beneficial as that coming to it from a clear running stream. The bogs that are

now badly scalded may very likely be improved by getting the roots of the plants into a more healthful stratum. This can be done by covering the bog with a layer of sand so thick that the roots may work up into it, leaving the old portion below. If, in addition to this, more attention could be paid to irrigation and drainage, it is not improbable that bogs now practically unprofitable might be made to pay a large dividend upon the investment. Persons who have sanded a few square rods as an experiment intend to extend the area this winter.

Rutgers College. *Byron D. Halsted.*

Correspondence.

In the Shore Towns of Massachusetts.—I.

To the Editor of Garden and Forest:

Sir,—Beginning at the New Hampshire line, in my search for public holdings in the shore towns of Massachusetts, I found that Salisbury has no land belonging to the town, no place on the shore to which the public can resort as a matter of right. Salisbury Beach runs the whole length of the town, from the mouth of the Merrimack River to the state line. It formerly belonged to the people in common, and was then regarded as of little value. It now brings important annual revenues to its owners, a corporation, entitled "The Commoners of Salisbury." The members of this body, forty or fifty young and vigorous business men, hold that they are more truly in the legal line of descent and inheritance from the early settlers than the present town itself. The town has so far recognized their title as to tax them on this beach property for the last seventy-five years, but last spring the people voted in town meeting to inquire into the title, and appointed a committee for that purpose. The corporation does not sell land, but leases sites for summer cottages, and there is an almost continuous village of these habitations along a great part of the beach, many of them fairly good houses. Visitors are welcome, for the owners wish to lease cottage sites to more people, but it is all private property, and the public goes there as a matter of sufferance or privilege, and not of right.

The city of Newburyport has a fine system of public parks or open spaces. Some of them have been long in use, and are restful and beautiful, while others are still in process of construction and development. Washington Park consists of about eight acres and has many fine trees. Brown Square, in front of City Hall, is two acres in extent. Kent Street Common, a half-mile away, has five acres in grass and paths. A mile and a half out on High Street is Atkinson Common, ten acres given to the city by Mrs. Eunice Atkinson Currier; this tract is not much improved as yet, as there are few residents in that vicinity, but it will be developed as the increase of population may require. Riverside Park has a front of 125 feet on the river and runs back 500 feet. The Improvement Association is raising money to build a bulk-head here, and thus furnish a public bathing-place. James Parton was much interested in the movement for new public reservations. He told me that for several years he had opened the grounds around his house to the children of the city for a play-ground—over an acre, with sward, flowers and shrubbery. Mr. Parton said the flowers were "almost never touched; not five times in a summer." These children's thought of him is a pleasant fame for this bright-spirited man to leave behind him.

Some of the leading women of Newburyport would like to have "The Captain's Well," which is celebrated in Mr. Whittier's poem of that name, preserved for public use, as the Captain desired, and as a tribute and memorial to the venerable poet. I believe the well is near the road between Newburyport and Amesbury, and it was said to be covered over and not in use, but I did not see it.

Newbury includes nearly all the northern half of Plum Island, with its extensive beaches and shore lands. These all belong to private owners, and ground is leased to summer visitors for cottages, as on Salisbury Beach. Many thousands of people from Massachusetts and New Hampshire towns come down the Merrimack Valley every summer to these beaches. Several crowded steamboats brought excursions the day that I was on this part of the shore. There is no public holding on the beach, but inland there are two small reserves owned by the town, Upper Green and Lower Green, four or five acres each, unfenced, grazed by the neighborhood cows, a few trees, and a school-house on each, with some interesting history in each case, beginning with the first white settlement of the region. The Lower Green was originally the Common of the "Old Town," which was laid out here near the Parker River before Newburyport was thought of. I saw a plat of this most ancient village, with the common much larger than it is now, and the adjacent house-lots all marked with their their owners' names.

The Upper Green was part of a farm owned by a minister in early times. He left this triangle between roads unfenced, and in time the town assumed title, and holds it by undisputed occupancy. Both these small parks have been encroached upon and reduced in area. A little care would make them attractive and valuable to the people of the town, who have no other places of public resort to which they can go as a matter of right.

The public lands and rights owned by Rowley are: 1. Rowley Common, in the nature of a park, in the centre of the village, about four acres, acquired from the Widow Hobsen for a training-field, by exchange of land, about 1670. It was beautified by planting a single row of Elms around it in 1839. 2. Two smaller commons, also in the village, both planted with Elms in 1839. 3. The town landing on Rowley River. 4. About one-fourth of an acre at the stock-yard, so-called, for use as a place for leaving horses when working on the salt-marshes. This has been somewhat encroached upon. 5. A small common in front of Town Hall, set with trees in 1856. There are no known town rights in the beach on Plum Island, nor any shore rights except the one town landing mentioned above, but it is probable that the public has the right of landing on Nelson Island, in Plum Island River, as this landing has always been in use by those who dig clams. Nobody else has any use for it.

This town, perhaps in greater degree than any other in the commonwealth, has remained the same as in earlier times, with people of the same blood living on the same lands, and living much in the same manner; the population is about the same, without much mixture from abroad. There are Bradstreets living to-day, as always, on the farm laid out to Humphrey in 1634, then in Ipswich, now in Rowley by annexation. The same, or nearly the same, may be said of the Mighills and of other families. The general interest in matters of local history is much less than one would expect to find here, but it is an interesting town to the student of civilization and to any observing visitor. Some of the locally historic names get changed or lost, and the errors are perpetuated by the map-makers. Thus a recent map shows the old name Hunsley Hill changed to Huy Slow, which is printed over Bradford Street Hill, leaving the real Hunsley nameless. The old Rowley, with its interesting survivals from a remote past, will not last much longer unchanged. The wayfarer who seeks a summer home by the sea pauses here and there along these quiet roads and notes the attractions of the scenery. "There is a fine view from this point." A new house will rise here, and alien faces will look from its windows across the fields which were first tilled by men whose very graves have been forgotten.

Ipswich has no public holding on the shore. There is a small and pleasant area called Meeting House Green in front of the principal church. This is the only park or public ground. The town contains an eminence with an interesting name—Heartbreak Hill—and I have been trying to find out whose heart was broken there, and why it was broken. I soon met the story of an Indian girl who loved a sailor and climbed to this hill-top to watch for his unreturning sail till she died. This account may be true, but I should like to know how old it is in this case. I am inclined to distrust it because the same story, or nearly the same, is told of so many places, Lovers' Leaps, etc., in all parts of our country. It does not seem that all these Indian girls could have broken their hearts in the same way. Early in this century, perhaps earlier still, the story was told in the Bradstreet family here of a young woman of their own race and name, Hannah Bradstreet, who went up this hill every day to see if her lover's ship was coming up the bay; and it never came. What we need to know about it is the time when the name was first given to the hill, or when it came into popular use, but I fear it is all irrecoverable. I am trying, however, to ascertain when the name was first put on the maps and into the Ipswich town records. Perhaps some reader of this account may be able to give me this information.

Essex has no real sea-shore, as Ipswich and Gloucester meet on the ocean beach, but Essex has all the lower reaches and broad expansions of Essex River, and all this shore is just about the same as sea-shore. It is all private property except the Town Farm and two or three landings. For many years a part of the Town Farm has been devoted to the uses of a public summer resort, the town officers leasing sites four rods by three for cottages, two adjoining lots to one person if desired. There is an area for picnics, clam-bakes, fish-dinners, etc. These grounds are on the bank of the river, and any-

body has a right to go there. The town owns the ground around several of the old landings, in one case two acres or more. Two of these places are now rented to ship-builders. The streams are said to be carefully guarded from defilement. The town has some interesting places connected with the history of a distinguished family, the Choates.

Gloucester, with 25,000 people, has no park or common or public holding of any kind that can be used as a place of resort. A fragment of beach near the Pavilion Hotel belongs to the city, but it is too small to be of much use. I asked some of the leading men where their people go for band-concerts or any out-of-door entertainment, and they said, "the band takes the sidewalk, and the people stand in the street." Next year Gloucester will celebrate her 250th anniversary, and her people have already begun their preparations for the event. They wish to establish an appropriate memorial at that time, and somebody has proposed that they endow a factory, so as to furnish work for laborers now unemployed. I urged the need of a park, common, or open space of some kind for public resort. The effort to establish a memorial of this nature would awaken widespread interest, and would attract the moral support of the Trustees of Public Reservations, of the press of the state, and of all public-spirited citizens. If anybody born in Gloucester has gone away somewhere and got rich, I hope he will remember his native city now, and help her people establish a Memorial Park. There can be no doubt that the higher interests of the city have suffered loss and injury from the want of any place of public resort. The local journalists are earnestly in favor of the park idea, and the farm adjoining the city, on the shore on the lower side, is admirably adapted to the purpose. It is the site of "The Old Stage Fort."

I walked entirely around Eastern Point, and found that the Eastern Point Associates have built a lodge at the entrance to their domain, and swung a gate across the carriage-road, with a notice requiring visitors to obtain permission in the lodge. I went on and was not recalled. The gate is intended chiefly, I suppose, to assert the right of exclusive occupancy, and people enter and pass freely, but a picnic party of country-folk would probably be turned back. There is no public holding along this very attractive shore, and the public has no right whatever even to walk by the sea here. I spent a summer at East Gloucester twenty-five years ago, and where I then passed weeks in solitude on the shore there are now long streets of costly houses. Thus far my quest shows leagues and leagues of shore lands all private holdings, a great population inland hedged away from the beach, and all conditions pointing to a time, not remote, when nobody can walk by the ocean without payment of a fee, as formerly we had to pay for a glimpse of Niagara.

Boston, Mass. *J. B. Harrison.*

Exhibitions.

United States Nurseries, Short Hills, New Jersey.

THE fall exhibition of plants and flowers, held at the United States Nurseries by Messrs. Pitcher & Manda, has become an interesting annual feature, much enjoyed by an increasing number of visitors. Extensions are still going on at this nursery, and north of the range of which the large Palm-house is the centre the sloping ground has been covered with six ranges of greenhouses some 200 feet long. These houses cover a rising slope with a southern exposure, and they form a striking picture; and in them, for the first time, Messrs. Pitcher & Manda are able to exhibit Chrysanthemums with justice to themselves, the former show-house being rather small when such free-growing plants as Chrysanthemums are to be shown.

During the exhibition week, October 26th to October 31st, the upper new range was filled with the new Chrysanthemums which have been selected from the thousands of seedlings of the establishment. Messrs. Pitcher & Manda have adopted the plan of growing their promising seedlings two seasons before offering them to the public for sale, and in the collection shown their best gains were seen, showing probably their fixed character. Their seedlings as thus shown were strikingly robust and well furnished with fine foliage, and mostly of the medium height so much desired by growers. Some single-stem plants were shown which, while taller, were not abnormally high.

Probably the most striking plant shown was W. A. Manda, a yellow hairy kind, well incurved and of a deep rich color. It is a very vigorous grower, but not more so than another seedling, the improved Mrs. Hardy, which in this respect is a contrast to the original. The flower of this variety is of the same character as Mrs. Alpheus Hardy, but is much deeper. Mrs E. D. Adams, a large white flower, with an outer swirl of petals somewhat in style of Madame C. Audiguier, was exhibited last year in poor form, but it has improved, and is a distinct desirable kind. Of other white kinds, George Savage is a grand incurved of the purest white and of fine form. Miss M. Colgate is a white incurved flower with broader petals and of a creamy tint. Other first-rate white flowers were Mrs. W. S. Kimball, reflexed and of fine form, and two as yet unnamed kinds, 169 and 278, differing, but with very broad petals. Of the colored flowers, Harry May, a massive deep incurved flower of bronze, will charm the lover of single blooms. Of a less massive character is Mr. Hicks Arnold, an incurved yellow, flecked with red, of fine form. Mr. D. S. Brown is a pleasing flower, lemon-yellow, with broad petals. Dr. Mandeville is a yellow counterpart to Mrs. E. D. Adams.

Of the less popular, though attractive, colors were Mrs. Mercer, incurved pink, with yellow centre, and an unnamed, No. 343, a bright cherry, Japanese, with gold reflex. Numerous striking varieties yet unnamed were to be seen in the house containing this show of remarkable productions. A lower house was filled with a collection of older varieties, many of which were the former offerings of this house. Still another house was filled with the year's seedlings in countless numbers, and all the varied shapes to be found by the seedling grower. Still another house, closed to the public, was seen to be filled with Chrysanthemums, and probably contained some of Mr. Manda's future surprises. The progress shown here in the successful cultivation of the Chrysanthemum is remarkable.

In the lower house was a glorious bench, some two hundred feet long and three feet wide, of a fine strain of hybrid-tuberous Begonias, both single and double. Few things make a more dazzling display or brighten up a house more than these wonderful flowers, with their pure, clear colors. Here I noted a new *Anemone Japonica-elegans*, darker than the pink type and with narrower, more frequent petals. The large Palm-house at Pitcher & Manda's is always an attractive sight, arranged as it is somewhat on the plan followed in private places. From this house branch off numerous smaller houses filled with small Palms, Anthuriums, Dracænas, Marantas, Billbergias, Nidulariums, and all the various fine greenhouse plants, among which it is a pleasure to loiter.

The famous Cypripediums have overflowed the large house always devoted to them, and now nearly fill the next range. The rage for these attractive flowers is unabated, and the collectors seem destined to have an unending succession of new forms as the new seedlings come into flower. These plants are systematically hybridized here, and a large collection of seedlings in a quiet nook gives promise of some surprises. Among the countless plants in bloom I noted *C. insigne Amesiana*, the rare variety with a broad white margin to the dorsal petal and without spots; *C. Schrœderæ splendens*, *C. Microchilum*, *C. tesselatum porphyreum* and *C. œnanthum superbum*. I noticed some very fine specimens of *C. Spiceri-anum superbum* in great masses, one containing sixty flowers. A mass of Orchids in flower greeted one in the next house, Vandas, Cattleyas, Odontoglossums, Oncidiums, Phalænopsis. A specimen of *Vanda Sanderiana* shown was said to be unique for size of plant, and could not probably be matched anywhere. This specimen had twenty-five flowers on four spikes. A large specimen of *Lælia anceps* was showing fifteen spikes, and a little later will be a grand sight.

A unique plant was *Lycaste Skinneri*, var., with flowers tinted light chocolate. But among so many beautiful and unique things it is vain to particularize. The old show-house contains no flowers, but is packed full on benches and under the roof with some thousands of *Cattleya Trianæ* plants. These have probably interested some visitors more than the bountiful flowers in the other houses, for here is a new lot of unbloomed plants lately sent in by the firm's collector, and there is the pleasure to the plant-lover of looking in anticipation on some novelties. I had a look at the hardy plantation to see if possibly any plants still survived the recent hard weather. There were a few small things in good form, *Stenactis speciosa*, and some new Delphiniums; but the most striking show was made by the white, large daisy-like flowers of *Leucanthemum lacustre*, though *Helianthus Maximiliani* was still in good form in another part of the grounds.

Space will not suffice to dwell further on special plants, but I noticed one exhibit aside from these which will interest exhibitors at flower-shows. This was a complete apparatus for staging single blooms for exhibition and known as Bunyard's Standard Exhibitor; in this flowers are perfectly displayed and held at any height with a very ingenious device for labeling varieties. In the former absence of such a contrivance our

flower-shows have usually presented a makeshift and somewhat unsightly lot of boards. In spite of the distance of Short Hills from the city the exhibition was thronged by interested visitors.

Elizabeth, N. J. *G.*

Notes.

The forests of British Columbia will be represented at the Columbian Exposition in a building composed of every variety of native wood.

Dr. J. H. Mellichamp, of Bluffton, South Carolina, sends us fresh flowers of *Gordonia Lasianthus*, the Loblolly Bay, taken from a tree covered with bloom. It is a young tree, fifteen to twenty feet high, and last year it also produced flowers in the autumn.

Referring to the note in a recent number of Garden and Forest relative to the absence of acorns this year, a correspondent writes from South Lancaster, Massachusetts, that there has not been so large a crop of acorns, chestnuts, shellbarks and butternuts in that vicinity for many years.

The Chrysanthemum Show at Madison Square Garden, in this city, is just opening as we go to press, and promises to excel in richness and variety any exhibition of its kind ever held in this city. Special features for each day will make a constant change and a succession of fresh flowers. The late bright weather has helped to open the blooms, so that nearly all the choice varieties will be seen at their best.

According to the *Kew Bulletin* there has been discovered in the forest of Bonket-Timah, near Singapore, a supply of the most valuable species of Gutta-percha-trees, which had been supposed extinct, ignorant natives having exterminated all the trees of which they knew in their eagerness to meet a demand for this special kind of gutta-percha, which was particularly esteemed for the making of submarine cables. The *Bulletin* deplores the fact that the location of the new find has been made public, and urges the Government to provide for the protection of the trees.

The frontispiece to *Gartenflora* in the issue for October 1st is a colored plate which shows forty-six fine varieties of Hyacinths, Narcissuses and Tulips blossoming at once in the window-garden of Herr Von Pommer Esche, in Berlin. They stand in pots in a slightly projecting glass bay thrown out from an ordinary window facing south-south-east, which opens from the living-room, and is heated only from this, and protected only by a roller-shade of thin slips of wood. The plants had been started in the house and removed to the window as their flowering-time approached.

We have received, through Mr. J. Wilkinson Elliott, of Pittsburg, Pennsylvania, a box of Tuberous Begonia flowers, raised in Mr. T. Tiffin's nursery at Westboro, Long Island, where the plants from which these flowers were taken have been grown in the open air all summer. The flowers are large, several of them measuring five or six inches across, of good substance and brilliant colors—scarlet, yellow and white. They show how well the Tuberous Begonia adapts itself to cultivation in the open ground in this climate, and what a really beautiful and valuable bedding plant it is.

A correspondent of a London paper recently spoke with emphasis of the wonderful development of the Cotton-planting industry in Turkestan. It is but a few years since American cotton was introduced into that country, and exportation began upon a considerable scale only in 1884, when the amount exported did not reach 10,000 poods. Last year 2,700,000 poods were exported, and it is expected that this year the amount will be one-third greater still. Thus far the crops have all been irrigated and cultivated by hand, and the cost of labor has therefore been very large. So it is believed that, with the coming introduction of improved machinery, the industry will increase much more rapidly than during the last ten years.

No more beautiful effect of color could be imagined than that produced during the latter part of October by the creepers which clothe the old reservoir on Fifth Avenue, in this city. The long lower fields of wall were covered two-thirds of the way to the top with thick masses of Wistaria, the still vivid green of which contrasted charmingly with the stretches of gray stone above them and the flat, close garment of Japanese Ivy which covered the three projecting pavilions. On the central pavilion this plant clung so tightly to the stone that the modeling of the doorway and the tablet above it was perfectly distinct. Its color was for the most part a deep warm red, but was flecked with leaves and sprays of a lighter hue, while the terminal shoots were bright pink or still a clear light green. The general tone thus produced was of enchanting richness and softness just because it was nowhere uniform over a single foot of the surface, but produced by varied blended tints.

An illustration in *The Garden*, of London, published on the 17th of October, represents a garden urn, the base surrounded by a bed of Clematis, which has been allowed to cover the pedestal upon which it stands. The effect is charming, and shows how well taken is the point made by our contemporary, that "if some principle of draping with living plants was carefully considered before introducing stone urns, temples, terraces or fountains into rustic scenery fewer of the violent and tasteless anomalies which so often disfigure our gardens and parks, both public and private, would be seen." The French for many years have covered the pedestals of out-door statues and other works of art with Ivy and various climbing plants, and in this way have succeeded in harmonizing such objects with their surroundings of grass, shrubs and trees.

As a result of the memorial recently laid before the President of the United States, asking that certain lands be reserved from settlement, with a view of using them as forest-reserves, the Secretary of the Interior has made the following appointments: Mr. M. J. Haley, of Helena, Montana, to examine the proposed reservation at the head of the Flathead and Marias rivers; Mr. J. F. Majors, of Jadis, Minnesota, to examine the proposed reservation in northern Minnesota; Mr. B. F. Allen, of Los Angeles, California, to examine the proposed reservation on the Tulare River, embracing the forest of Big Trees; Mr. J. S. Stidger, of Santa Fé, New Mexico, to examine the proposed reservation in western Texas at the head-waters of the Pecos River. Friends of the movement to secure these reservations can communicate directly with these agents in case they have any suggestions to offer in the premises.

A correspondent of the *American Architect and Building News* recently described a miniature model, now on exhibition in Chicago, which gives a bird's-eye view of the future aspect of the World's Fair grounds and of the principal buildings thus far determined upon. It has been constructed in the old exposition building, covers a space of 100 x 50 feet, and affords, says the writer, "a better view of the structures in their entirety than very likely will be possible on the exhibition grounds. The relative positions and sizes of the buildings are correct, and the whole lay of the land is carefully imitated. Lake Michigan is indicated by a stretch of running water, being, in fact, a diminutive portion of the lake introduced into the building. Jackson Park, Midway Plaisance, all, are represented by a clayey, paste-like substance painted green. Ground Hemlock is used in the place of the symmetrical Elm, and the whole settlement in the night-scene is illuminated by the smallest-sized electric lamps. When these shine across the turbulent lake or are reflected in the quiet lagoon or shine forth from the doors and windows of the miniature buildings the effect is quite unique."

The October bulletin of the Hatch Experiment Station of the Massachusetts Agricultural College contains a report of the result of experiments during last winter with special fertilizers for plants under glass. For this purpose six plots were arranged in each of two greenhouses, and planted with the same number and kind of Carnations at the same time in September. The soil, temperature, ventilation and all other conditions were kept as nearly alike as possible, and the number of blossoms produced by each plot was recorded. Observations continued during thirty-one weeks showed that the plot fertilized with nitrate of potash gave the best results, sulphate of potash the next, and dissolved bone the poorest result. This result differed from that of the previous winter, when bone-black stood first and sulphate of potash second, and is probably due to the insoluble condition of the bone-black, which in previous tests did not give good results until the latter part of the trial. In five experiments made in this line three have been in favor of bone-black, one of sulphate of ammonia and one of nitrate of potash. Sulphate of potash has stood second in every test. The nitrate of soda and muriate of potash, in every case where the crop has had a tendency to mildew, have given poor results, owing probably to their power of holding moisture near the surface of the soil. In the growth of the Rose, Lettuce and Carnation a moist atmosphere or a very moist soil in contact with the plants, especially at night, must be avoided if success is expected, and, therefore, such fertilizers as nitrate of soda and muriate of potash would aggravate any such condition. The same bulletin contains a chapter on "Experiments in Greenhouse-heating."

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Public Gardens.

It has been urged in defense of the methods employed in the Boston Public Garden, to which a writer in these columns recently took exception, that this form of gardening is popular with the public. This might also with truth be said of a certain extraordinary construction in a Chicago park, where, for the admiration of the public, is displayed a gigantic vegetable globe, bearing upon its surface a map of the world delineated in Echeverias upon a ground of Sedum. Popular this undoubtedly is, and wonderfully made, the pride and delight of the local gardeners and of the press; it represents a vast amount of labor and care, as well as great expense; but it is bad art all the same, as foreign to the real mission of a public garden as it is obnoxious to cultivated taste. An object distinctly demoralizing to those to whom it is exposed as an object of admiration.

It is not the function of the true gardener to cater to popular taste, but to educate it. As a general thing people do not know just what they ought to like until they are told. There are those unfortunates who prefer the glory of a chromo to the quiet of an etching, a Brussels carpet to an Indian rug, a shilling shocker to a novel by an eminent hand, but it does not follow that these should be the only things provided because they happen to hit the popular fancy; on the contrary, it is the constant effort of the best reviews, the best newspapers and the best public libraries to elevate the taste of the uneducated, to show wherein simplicity and breadth in art excel violence and pettiness, to establish tests of beauty, and to help the world to distinguish the true from the false standard. And this should be equally true of the best gardens.

There is no excuse for uncertain notes from public gardens, for here there is no question of supply and demand. The public have to take what is given them, and they will not absent themselves from their accustomed pleasure-grounds even if their beloved monstrosities are removed, and a quiet and artistic arrangement substituted for one that is artificial and grotesque. A public garden is even more valuable than an art museum as an educator of taste, since it is seen by ten times as many people, and the city which owns one owes it to its inhabitants to instruct them in matters of taste as well as to excite their wonder and curiosity. To do things simply to please them when such things are in themselves violations of good taste, is equivalent to hanging the walls of the Art Museum with chromolithographs as more likely to be "understanded of the people" than the mysteries of Corot or the subtle values of a landscape by Daubigné.

The general public does not know good from bad in gardening, and, therefore, this is the requisite lesson to teach it. Americans are as keen to recognize the good, when once distinctly shown to them, as any people who exist; and a Boston public is especially conscientious and eager to think aright if it can only be taught how.

The instance adduced by our correspondent is a case in point. The Water-lilies were introduced as an experiment into the parks and squares of this city when it was doubted whether the public would care for them, and it was feared they might molest and injure them. On the contrary, they have been appreciated and enjoyed, and have not been disturbed. They are beautiful, they are refined, they have appealed alike to the most delicate and the simplest taste, and have so proved themselves both enjoyable and appropriate decoration. The immense parks in this city and in Brooklyn are great models in landscape-gardening. Are they the less satisfactory to any one on that account? Give the people beauty, both of color and arrangement, and insensibly it impresses itself upon them as a law. Good gardening, skillful grouping of shrubs and flowers, will be quickly imitated in a small way, and a knowledge of propriety in composition will thus be disseminated.

As a nation, the French have fine and discriminating taste, but that taste has been cultivated to its present point of perfection by the constant familiarity of the masses with what is excellent in architecture, painting and the plastic arts, of which they constantly behold excellent specimens. In the galleries of the Louvre and the Luxembourg the traveler is often struck by the delicate appreciation of beauty shown by people in caps and blouses. For generations this sense has been unconsciously trained by the continual observation of beautiful and appropriate forms, and by the knowledge that certain things are admirable, and the consequent effort to understand why they are worthy of esteem. The standard being once set up, insensibly their minds become adapted to it, and their judgment grows secure. It is only thus that the education of any populace can be accomplished. Constant familiarity with the really beautiful cultivates a distaste for what is false and violent. In Japan the very infants have an instinct, which we acquire only by patient study, of that restraint and delicacy and economy of material which is the secret of the best art.

In old times, before exploration and facilities of transportation brought masses of exotic and tropical plants to the gardener's hands, gardening was more beautiful than it is at present, because it was simpler and less confused. The temptation now is to overdecoration, both of public and private gardens, and even the French suffer from an embarrassment of riches which they have not quite learned to grapple with. They show the same tendency to interfere with the breadth of a lovely garden view by the interpolation of great overloaded flower-beds that we do, but in the composition of these beds their trained color-sense shows itself, and they produce a more harmonious composition. Thanks to the inherent German love of nature, and possibly also to the fact that the climate of Berlin is so severe that the number of varieties of delicate plants which can be grown there is very much restricted, the finest city gardens, that is to say the simplest and most natural, are now to be seen in the Prussian capital.

The most general failure in modern gardening arises from the attempt to grow as many things as possible without any reference to the propriety of associating them

together, and every one tries to make a museum or a botanic garden instead of an attractive and restful surrounding to a home. This fault is emphatic in many public gardens, which should be the first to teach a lesson of restraint, of breadth of treatment, of judicious selection and arrangement of a few interesting plants. The most beautiful of all gardens are the old ones, which were limited in the matter of vegetation. The material was scantier then, but the results far better. Where there is much to distract the attention, a multiplicity of detail, it is impossible to derive from a garden that sense of intimate charm which should be its finest characteristic. To be conscious of grace and beauty, of repose and harmony in a pleasure-ground, is impossible when the mind is kept on the alert by endeavoring to take in a hundred new and curious things.

This thirst for photographic detail is the foible of the age; it is thrust upon us at every turn—in pictures, in novels, in current literature, in gardens. The landscape is be-kodaked till fancy and imagination are well-nigh knocked out of the picture. The way of seeing things, the art of composition, is cast aside for the things themselves, heterogeneously thrust upon us. It is the death of the finest art, of repose and dignity and noble simplicity. A delicate suggestion as far outvalues a bald statement as a poet's verse excels a catalogue.

Leave Nature alone and there is never this emphasis of detail. Masses she gives, with here and there an accent, but no overwhelming sense of clutter, of the unimportant and wearisome variety with which man encumbers his landscape. And yet what infinitude the great Artist compresses into comparatively simple expression, but it is as a whole we see her most splendid panoramas, not as a collection of disjointed parts. To learn to express this secret of unity in variety is the lesson of the true gardener, and this it should be his part to teach by vivid and beautiful example.

The guardians of public pleasure-grounds should bear in mind that these resorts are for the education of the public; that they hold their office not to minister to unlearned and vitiated taste, but to appeal to the finer and higher perceptions which may be latent in the most unlikely quarters. The multitude grope in the dark, longing for light. Let that light be true, and not false—a guide, and not a concession; a beacon, not a mirror.

It is wise to show people what can be done with simple and easily accessible material; with perennial plants; with beautiful, but not uncommon, annuals; with shrubbery that can be cultivated in almost any garden; with hardy plants that may be found blooming early and late, when exotics must be housed, and tender things wizen in a chilly wind. Rare things, too, there may be, but let a part of every public ground serve as an example to all who love gardens. There are millions of people, who cannot afford a landscape-gardener, but would be grateful for a hint of how to manage their own little grounds in a way that would be pleasing without being costly, and that would be reasonably permanent. Not until public gardeners realize that they have a mission to perform will they truly merit their high office, for it is a high office to develop taste, to define beauty, and to indicate dignity and grace in the arrangement of trees and shrubs and flowers.

Waste Places.

SCATTERED throughout the eastern states, in fact, on nearly every farm, are untillable places that are almost non-productive, and, being almost worthless, greatly reduce the average acre-value of the farm. Such places are usually wet or rocky, and are pastured, whether profitably or not is for those immediately concerned to decide. But the present depression in the dairying business, together with the increasing value of lumber, has suggested some notice of waste tracts on which timber has been permitted to grow and of which the history is known, in the hope that suggestions may be found that will apply to tracts at present unprofitable. One such lot, which seems characteristic, was found in Warren County, New Jersey, in the Pequest Valley, and is a fair example of what may be expected on muck land that produces only Sedge-grass and wild Rose-bushes when cleared and pastured. Some of the notes of most general interest are here given. The soil is muck, from one to four feet deep. The subsoil is drift redeposited by a post-glacial lake near its eastern shore, and consists of sand and clay irregularly bedded, with some "hard pan." A spring-brook flows through the tract. The surface of the water in the brook is above the surface of most of the subsoil, and supplies the soil with abundant and constant moisture, except during unusual drought.

Prior to 1858 this lot of seven acres had been continuously depleted of tree-growth and burned over. At this date a few defective trees, say twenty, were standing, with about half of the tract in coppice of Maple and Ash, the remainder being occupied by Sedge-grass, Rose-bushes and scattering seedlings. The whole young growth was then cut off, and during the next ten years it was burned over every spring to reduce it to pasture. In spite of the fire and pasturing, the young growth gradually developed into a complete cover. The Maples, starting freely among the Sedge-grass, were at first eaten off by the cattle, but dense clumps and belts of Rose-bushes annoyed the cattle, and, finally, with Blackberry-vines, formed so dense a hedge near the adjacent cultivated land that the cattle seldom penetrated into the young growth of trees.

The last places to be covered were two very wet spots (where the seedlings at last started on decayed logs, sending their roots down a foot or two to the soil, as the logs rotted away), and the higher ground that was never overflowed. The latter was most grazed by the cattle, and was only covered by seedlings after the cattle were hedged out. The trees are thus not all of one age; some are from the seed, others are sprouts from the small stumps left from browsing. The trees near the "fail places," or those places last covered, started up very limby, and are now much shorter than those densely grown from the first. The species found on this lot were Red Maple, Black Ash, Swamp White Oak, Pin Oak, Sycamore, White Birch and White Elm. The Red Maple is throughout the most numerous, and in the parts most subject to overflow is only accompanied by a few Ash and Elm. The oldest of the trees are now about thirty years, and the youngest fifteen years. The greatest space between trees is twenty-five feet, and the average is about seven feet.

The growth on the whole tract is vigorous, and the crown cover is very nearly complete. The trunks of the best trees are free from live limbs to a height of thirty feet above the ground, and are now nearly smooth, though a few dead branches are still adhering near the lowest live limbs. Many inferior trees are dead and sickly from overcrowding, but the remainder will be the better for their death. All the leading trees are vigorous. It is noticed that the White Birch and the Swamp White Oak are rapidly overtopped and killed by the Red Maple. The Elm holds its own with difficulty, while the Ash, in damp spots, where there is more space, seems to equal the Maple, and will eventually overtop it.

An area was selected that seemed to represent fairly the average of the whole tract. The measurements on this acre showed the average to be as follows: Number of trees per acre, 901; height, 48 feet; diameter, 6 inches on stump, and 5 inches breast-high; contents, 4.1 cubic feet per tree, or 3,685 cubic feet per acre; merchantable wood, 3.4 cubic feet per tree, or 30.6 cords per acre.

TABLE OF GROWTH.

No. of Section.	Dist. from Ground.	No. of Rings.	Diameter.
No. 1.....	8″	24	6″
No. 2.....	4′ 8″	22	$4\frac{15}{16}$″
No. 3.....	8′ 8″	20	$4\frac{9}{16}$″
No. 4.....	12′ 8″	19	$4\frac{3}{8}$″
No. 5.....	16′ 8″	16	4″
No. 6.....	20′ 8″	15	$3\frac{5}{8}$″
No. 7.....	24′ 8″	13	$3\frac{1}{4}$″
No. 8.....	28′ 8″	11	3″
No. 9.....	32′ 8″	9	$2\frac{5}{8}$″
No. 10.....	36′ 8″	8	$1\frac{7}{8}$″
No. 11.....	40′ 8″	5	$1\frac{1}{4}$″
No. 12.....	44′ 8″	3	$\frac{5}{8}$″
No. 13.....	48′ 8″	1	$\frac{1}{8}$″

The value of this land at the time attempts at clearing were abandoned in the year 1868 was not more than ten dollars per acre. To-day the market value of the wood-growth alone is $30.00 per acre.

Department of Agriculture, Washington, D. C. *H. B. Ayres.*

Holiday Notes from Switzerland.—II.

BEFORE reaching Tiefenbach, at an elevation of 6,790 feet, we found *Pedicularis tuberosa*, a handsome pale yellow flowered species, in abundance, also the three Vacciniums, the Whortleberry, *V. Myrtillus*, *V. uliginosum* and the Cowberry, *V. Vitis-idæa*. Soldanellas were also seen, but at this elevation they were all long past the flowering stage; toward the close of our holiday, at the very edge of the snow-fields, we found them in flower. The Rosage, or Rose des Alpes, *Rhododendron ferrugineum*, was also out of flower at this elevation. The common Monk's-hood, *Aconitum Napellus*, exhibited its panicles of blue blossoms in a sheltered rocky hollow—only one colony of this species was noted during our first day's tramp. The Crowberry, *Empetrum nigrum*, was common by the roadsides, as was also the Bluebells of Scotland, *Campanula rotundifolia;* in Scotland this species ascends to about 3,500 feet. Here, too, was seen our first living specimen of *Nigritella angustifolia*, a beautiful alpine Orchid with grassy leaves and a dense spike of small blackish purple flowers with a strong vanilla-like fragrance.

The next morning we left Tiefenbach and followed the Furka road, constructed, under many engineering difficulties, principally for military purposes. The road crosses the Tiefentobel, and we leave the fine waterfall formed by the discharge of the Siedeln Glacier on the left; high above this rise the jagged, pointed peaks of the Bielenstock (9,969 feet), and straight before us the Furkahorn. In several places magnificent views are obtained of the Urseren Valley and the pinnacles of the Spitzberge and other mountains. At the Furka Pass, 7,992 feet high, a saddle between the Muttenhörner on the left and the Furkahörner on the right, a glorious panorama unfolds itself, the most imposing object being the snow-clad Finsteraarhorn, the highest of the Bernese Alps, which rises to a height of 14,000 feet. Shortly after crossing the pass, one of the most striking sights we met with, as far as plant-life is concerned, was furnished by an extensive, very steep, slope, thickly studded with *Campanula thyrsoidea*, a remarkable species, about fifteen inches in height, with narrow leaves and a dense, leafy, oblong spike of rather large creamy white flowers. Near trickling rills of water *Silene acaulis* formed compact cushions of the brightest green, thickly set with pretty red flowers. The blue-flowered *Campanula Cervicaria* also occurred, though much less frequently than *C. thyrsoidea*. *Gentiana verna*, one of the most beautiful of all alpine plants, grew in company with the Silene, and its turf-like masses of small dark green leathery leaves were in some cases almost hidden by their wealth of flowers of heaven's own blue. *Cirsium heterophyllum*, a handsome thistle with long-stalked purple flower-heads, was noted here; it is a plant worthy of a place in the herbaceous border. Nigritella, too, was frequent. From the Galenhütten admirable views are obtained of the fantastic ice masses of the Rhone Glacier—resembling a gigantic frozen waterfall—and of the mountains between which it is embedded. Instead of following the road from the Galenhütten we scrambled through the tangle of Alders, Juniper, etc., and in due time reached the base of the glacier. *Alnus viridis*, the Alder just referred to, is a species which nearly marks the highest limit of tree-growth in the Alps, and is generally found in abundance on the sites of old moraines. *Juniperus nana* grew in company with the last-named, and in open places *Epilobium Fleischeri*, a fine Willow-herb, with showy rose-colored flowers. Here, too, we noticed a few clusters of St. Bruno's Lily (*Paradisia Liliastrum*) and St. Bernard's Lily (*Anthericum Liliago*), with their snowy white blossoms still in full beauty. These two species are deservedly popular in British gardens, as they thrive readily and adapt themselves to conditions wonderfully different from those which obtain in their native habitats. *Lilium Martagon* was observed in some plenty, but no color variations were noticed.

A dwarf Achillea (*A. nana*), with white felted pinnate leaves and short stems terminated by almost globular corymbs of inconspicuous flowers, was seen. The neat habit of this plant and the beauty of its white leaves would make it a favorite with the devotees of carpet-bedding—a fashion which all persons of rightly constituted minds are glad to see rapidly declining—if only it would lend itself to cultivation. At the very base of the glacier, where only a few inches of soil and débris covered the solid ice, the Kidney Vetch (*Anthyllis vulneraria*) was covered with its heads of yellow flowers. *Linaria alpina*, too, had but few competitors here, where even grasses and sedges were scarce. The Anthyllis was the prevailing plant, and gave a distinct character to the scene.

A rest of an hour by the infant Rhone, which the ancients poetically describe as "descending from the gates of eternal night at the foot of the pillar of the sun," sufficed to set us up for our further walk of ten miles to Münster. Fine forests of Scotch Fir, Norway Spruce and Larch intermixed, the latter with its branches laden with long masses of Usnea (a lichen called Old Man's Beard in England), occurred on part of our way. The quaint villages of Obergestelen, Oberwald and Ulrichen (a walk of three hours and a half from this place brings us to the Gries Pass, the boundary between Switzerland and Italy), with their very primitive wooden chalets—outside nearly every one of which was a great heap of cow-dung—were passed before we reached the comfortable inn at Münster, the "Goldnes Kreuz."

Royal Gardens, Kew. *George Nicholson.*

Forest-vegetation of the Upper Mississippi.—III.

THE Cottonwood (*Populus monilifera*) grows abundantly along the Mississippi River in bottoms, where both sandy and rich soil seem favorable for its development, and the trees are often of very large size. They are seldom found, however, on the uplands away from the streams, except as recent introductions. The species is now sometimes found in the neighborhood of stone quarries in the loose clay soil. Trembling Aspen (*Populus tremuloides*) is common in the rich black soils of second bottoms, or the humus soil on ridges. Near Dubuque it occurs around rocky ledges. The species grows in groups, sometimes several acres in extent. It is a short-lived tree, and is followed by more useful trees, like the Oak. The Large-toothed Poplar (*P. grandidentata*) is less common than the last. It is found in more or less isolated groups in sandy and clay soils, and its growth is more rapid than that of the Trembling Aspen.

A few trees of the Sycamore (*Platanus occidentalis*) were observed at Turkey River Junction, Iowa. From this point southward it is more frequent in the Mississippi River bottoms.

The Hackberry (*Celtis occidentalis*) occurs in rich soil of the bottoms of Root River and other streams; and not infrequently it is found on the rocky limestone cliffs, as at North McGregor, Iowa. It is a tree which can adapt itself to a variety of soils, and, when cultivated, it does admirably on poor sandy soil.

The Birches are fairly well represented, the most common species being the River Birch (*Betula nigra*). It, with the White Maple, more nearly typifies the timbered region of the Mississippi bottoms than any other tree. The Black Birch diminishes in numbers southward. The Canoe Birch is common about La Crosse and Trempealeau, Wisconsin, where it is usually found on the tops of the limestone bluffs, though also occurring in ravines and ridges as well as in sandy soil. On some of the rocky hills it is almost the only tree. It rarely attains great dimensions, except when growing in rich clay soil. Near Dubuque it is scarce. Yellow, or Gray Birch (*B. lutea*) is found more abundantly along the sandy, rocky cliffs of the Kickapoo. It also occurs on sandstone rocks near a Tamarack-swamp not far from La Crosse. It is not a common tree.

Quite a grove of small Kentucky Coffee-trees occurs south of La Crescent in the Root River bottoms, and on the Wisconsin side there are two or three trees about seven miles below La Crosse. They are from twelve to fifteen feet high. It is much more numerous on steep hillsides near North McGregor, but none of the specimens are large. From this point southward it is more numerous. I noted it at Clayton, Turkey River Junction and Dubuque. It does not occur in the interior of the country east of La Crosse.

The Honey Locust was observed near Turkey River Junction, Iowa; from thence southward it is more numerous.

The Black Locust (*Robinia Pseudacacia*) has established itself near La Crosse and Trempealeau, Wisconsin.

According to Mr. Harris, the Red Mulberry formerly flourished in the Root River bottoms near La Crosse. I have not seen it, however, growing wild. Scattered specimens were found at North McGregor, Iowa, and it is more numerous near Dubuque.

Basswood is largely influenced by moisture. Rich black soil and damp grounds, sloping to the north, are favorable situations for it, and it is commonly found along the rich bottoms of the smaller streams and creeks.

The American Elm is a common tree everywhere along the creeks and streams near springs; occasionally, also, in upland woods in dry soil. The Red Elm (*Ulmus fulva*) is not uncommon on the rocky slopes of hills along the Mississippi. It is absent or rare in the interior of the country. The Cork Elm (*U. racemosa*) is far less common than *U. Americana*.

It occurs near La Crosse, along some of the smaller streams, and I observed it near Turkey River Junction, Iowa.

The White Pine is the most common conifer along the Black River. In the northern part of La Crosse and in the eastern part of Vernon County it is common on the sandy loamy soil. Near the Mississippi River it only occurs on the sandstone ledges. Large trees were once found at La Crescent, Minnesota, and quite a group of these Pines occurs near Clayton, Iowa. Northern Scrub Pine (*Pinus Banksiana*) occurs on sandy prairie soil along the La Crosse and Black rivers, where little else grows besides some tough grasses, Prairie Clover, Lupins and Wild Indigo. Red Pine (*P. resinosa*) occurs in isolated places in the sand bottoms of the Black River and sandy rocky ledges of the Kickapoo River.

Hemlock I have not found along the Mississippi River, nor does it occur near the mouths of the Black, La Crosse and Wisconsin rivers, but near Rockton, on the Kickapoo River, which is a tributary of the Wisconsin, numerous groups occur. The Trailing Arbutus and *Clintonia borealis* flourish under its shade among decaying logs and leaves.

Tamarack grows in the peaty swamps of La Crosse and Trempealeau rivers. During dry years portions of the Tamarack swamps are passable, but during wet years they are for the most part very wet. Owing to frequent overflows, which carry with them much soil from tilled land, these swamps are gradually filling up, and, as a consequence, the Tamarack in these localities is losing ground. I found a small swamp near La Crescent, Minnesota, but in a few years this swamp will be a thing of the past.

Red Cedar (*Juniperus Virginiana*) grows along the Mississippi River, on the sandy out-crops and limestone rocks, and most abundantly in the sandy bottoms of the Black River.

I have indicated, in a measure, the principal forest-trees between Trempealeau, Wisconsin, and Dubuque, Iowa. In the northern portion *Betula papyrifera*, *B. nigra* and *Juglans cinerea* are more numerous than farther southward. *Platanus occidentalis*, *Gleditsia triacanthos*, *Gymnocladus dioicus*, *Juglans nigra*, *Quercus Muhlenbergii* and *Morus rubra* are southern trees which have moved northward along the Mississippi, and, therefore, are found close to the shores.

Agricultural College, Ames, Iowa. *L. H. Pammel.*

New or Little-known Plants.

A New Hybrid Rose.

WE have more than once insisted on the value of the Japanese *Rosa multiflora* as a hardy shrub. A figure illustrating its flowers and foliage was published some time ago in this journal. The picture in the present issue is of a fine specimen in the garden of Mr. John Robinson, of Salem, Massachusetts. It shows the manner of growth of a plant which possesses an individual beauty surpassed by that of few of the plants found in our gardens; and apart from its own merits it seems destined to play an important part in the creation of a new race of hardy climbing Roses.

Mr. Dawson has been hybridizing it at the Arnold Arboretum and has already produced two or three distinct seedlings of very considerable value. We are able to produce on page 533 of this issue a photograph of one of these hybrids obtained by crossing *Rosa multiflora* with the well-known Hybrid Perpetual General Jacqueminot, the latter being the pollen parent. The result is a vigorous and hardy plant with a tendency to climb high. The spines and foliage are those of the pollen parent, but the flowers are clustered like those of *R. multiflora*, sometimes as many as sixty being developed in a single panicle. They are semi-double, rose-colored, an inch across, and exceedingly fragrant.

In *Rosa multiflora* may be found the ancestor more or less direct of the so-called Polyantha or miniature clustered Roses which have become popular of late years in English gardens; but none of these are hardy or very satisfactory with us here in the northern states, probably because they or their parents are of southern origin, and the real interest of the results obtained by Mr. Dawson lies in the fact that by working from an absolutely hardy form of *Rosa multiflora* he has been able to lay the foundation for a race of hybrids of as great or greater beauty than any of the Polyantha race found in gardens, and absolutely hardy.

We intend to figure some of the other hybrids obtained by Mr. Dawson from this cross; among them is one with the habit and foliage of *Rosa multiflora*, with small, semi-double, fragrant, pink flowers, which is, perhaps, even more distinct and beautiful than the one which forms the subject of the illustration in this issue.

New Orchids.

Cymbidium Lowianum, var. concolor, Rolfe.—A very striking variety, in which every trace of red has vanished from the flower, which thus becomes of an almost uniform light greenish yellow, and forms a decided contrast with the ordinary form. It appeared with Mr. C. Eastwood, of Lane House Nursery, Luddenden, Manchester.—*Gardeners' Chronicle*, August 15th, p. 187.

Cypripedium × macrochilum, Hort.—A hybrid raised from *Selenipedium longifolium*, fertilized with the pollen of *Uropedium Lindeni*. It bears much resemblance to *S.* × *grande*, of which it may be considered a variety, with somewhat larger lip and other slight differences. It is a very interesting hybrid, and furnishes another kind of proof that the Uropedium is only an abnormal state of *Selenipedium caudatum*. It was raised by Messrs. James Veitch & Sons, of Chelsea, and was awarded a first-class certificate by the Royal Horticultural Society, on August 11th last.—*Gardeners' Chronicle*, August 15th, pp. 199, 201; September 19th, p. 343, fig. 40.

Oncidium Forbesii, var. Measuresiana, Kränzlin.—A variety with yellow flowers and a very pale border. It appeared in the collection of R. H. Measures, Esq., of The Woodlands, Streatham.—*Gardeners' Chronicle*, August 22d, p. 227.

Catasetum ciliatum, Rodr.—An elegant little species, described some years ago and now appearing in cultivation for the first time in the collection of M. Robinow, Esq., of Didsbury, who received it from the Amazon district, in Brazil. The sepals and petals are greenish white and reflexed, the petals of the same color and erect, and the triangular, acute, concave lip whitish, tipped with deep maroon-purple, with light purple transverse lines on its basal half, and with purple bristle-like hairs, half an inch long, on the sides near the base. The flowers remind one of some peculiar bees on the wing. It is very distinct from *C. roseo-album*, its nearest ally. *Gardeners' Chronicle*, August 29th, p. 242.

Kew. *R. A. Rolfe.*

Plant Notes.

Some Recent Portraits.

The following plants are figured in the October issue of the *Botanical Magazine*:

Yucca filifera (t. 7197): this is the great arborescent species of which portraits appeared in the first volume of Garden and Forest (Figs. 13, 14). The history of the plant from which the figure in the *Botanical Magazine* was made is interesting. The trunk was sent to Kew in October, 1888, by Mr. C. G. Pringle, who collected it at Monterey, in Mexico, as a museum timber specimen. When it arrived at Kew it was apparently quite dead, and the trunk was placed in the museum. Here it remained two years and then put out some rudimentary leaves and an inflorescence, and, being transferred to the temperate house, these developed in September, 1890. The leaves were very short, as compared with those on the wild plant, and the panicle of flowers is less dense, and, curiously enough, is erect, not pendulous.

Cirrhopetalum Collettii (t. 7198): this is an Orchid discovered by Major-General Collett in the southern Shan Hills, and is one of a collection of several hundred species made by him during the late Burmese war, including many plants previously unknown to science. The flower is "remarkable for the extremely long attenuated sepals, which are highly mobile and are wafted about by the slightest

breath of air; and also from being furnished with a number of little streamers or banner-like appendages which, when blown by a breath of wind, wriggle about in a very odd manner." Mr. Hemsley has pointed out a peculiarity in the mode of growth of this species in that the flower-scape is not formed at the base of a fully formed pseudo-bulb, but is developed together with a young leaf, which afterward forms a pseudo-bulb, and is enclosed in the sheaths with it.

Napoleona Miersii (t. 7199): this is the representative of a small genus of west tropical Africa which, in the structure of its flowers, is one of the most curious of flowering plants.

Eucryphia Billardieri, var. *Milligani* (t. 7200), a native of Tasmania and a member of the Rose family, with pale narrow leaves and small solitary white flowers.

Epiphyllum Gærtneri (t. 7201): this is the species so long supposed to be a variety of the well-known *E. Russellianum* now a universal favorite in gardens where greenhouse plants are grown. It differs from that plant in the much larger, broader, thicker crenulate articulations of the stems, broadly truncate at the top, regularly crenate on the sides, with tufts of long hairs both in the crenatures and around the base of the flowers. These present even greater differences in their more brilliant coloring, in the length and narrowness of the petals, in the almost terete

Fig. 82.—A New Hybrid Rose.—See page 532.

(not broadly winged) calyx-tubes, in the very numerous stamens with clustered minute anthers, and in the spreading stigmas.

Foreign Correspondence.

London Letter.

Horticultural Education.—A few weeks ago I mentioned a scheme which was being formulated by the London Worshipful Company of Gardeners and a section of the Royal Horticultural Society which had for its object the establishment of a "School and College of Technical Horticulture and Small Husbandry." The scheme is published to-day in *The Standard*. The aim is "to impart a higher class of education in the principles and practice of the cultivation of fruits, flowers, and vegetables than is at present obtainable in Great Britain." Students will be expected to remain at the school at least two years, during which period they will devote themselves to the manual as well as to the scientific branches of the work. By this it would appear that whatever is not manual in horticulture is scientific, and everything manual is unscientific. Directors of cultivation and qualified lecturers are to superintend and instruct. It is proposed that the gardens of the Royal Horticultural Society at Chiswick should be utilized for this purpose. Beside this scheme we have now actually at work a number of lecturers who have been appointed by several of the county councils in the south to lecture in the towns and villages on the cultivation of the small farm, the garden, and the allotment piece. These lectures, however, are intended for the uninformed in matters horticultural rather than for professional men. It is also proposed to introduce the subject of land culture into the curriculum of schools. At present there appears to be some difficulty in finding qualified men for all these new posts. The value of these several well-intentioned schemes for the propagation of a knowledge of horticulture among the masses remains to be proved. It is questionable if much real or useful knowledge is ever imparted by lectures. The fancy may be tickled or a wish for knowledge may be the outcome of a lecture, but as a direct means of education this popular form of teaching is open to doubt. The schoolroom gardener is not likely to prove superior in cultural skill to the man who has obtained his knowledge of his art by constant practice in the best gardens.

Streptocarpus Galpini, Hook f. (n. s.)—This is a new species of Streptocarpus which is now flowering at Kew. It belongs to the monophyllous group, of which *S. Dunnii*, figured in the last volume of Garden and Forest, is the most remarkable species. The new one has a prostrate fleshy leaf, not so large as that of *S. Dunnii*, the largest at Kew being eight inches long and five inches wide; the nerves are very prominent on the under side and are tinged with purple; the whole leaf is covered with a soft silky pubescence, which gives the upper surface a silvery appearance. The plant now in flower has four erect racemes springing from the base of the midrib of the leaf; they are six inches high, and bear each about twelve flowers, arranged in pairs and opening in slow succession, pedicels one and a half inches long and reddish; calyx formed of five small linear lobes; corolla, with a short broad tube less than half an in h long; lobes spreading, orbicular, the lower one projecting a little and forming a kind of labellum. The flower is nearly one and a half inches across and colored rich lavender-blue, with a clear white throat. The general expression of the flower is not unlike that of *Ramondia Pyrenaica*, but they are larger. Fourteen flowers have been opened together on one plant. I consider this by far the prettiest of all the species of Streptocarpus hitherto introduced. We have no in-door plant which flowers at this time of year that will compare with it. In the shortness of its flowers it differs markedly from all other cultivated plants of this genus. Seeds of this plant were sent from the Transvaal to Kew last year by Mr. E. E. Galpin, of Barberton. A figure of it will shortly be published in the *Botanical Magazine*.

Bordeaux Mixture for Potato Disease.—Experiments have been made in England this year to test the value of Bouillie Bordelaise as a cure for Potato disease. In the *Kew Bulletin* for 1889 there was published some interesting correspondence on the extensive use in France of this substance, which is a mixture of sulphate of copper, slaked lime and water, for the prevention and cure of mildew and other fungoid diseases of the vine. The possibility of its proving equally efficacious with Potatoes induced the Board of Agriculture to arrange for experiments to be made with it in various parts of England. The reports on these experiments so far are not conclusive, some cases showing an improvement in the crop where the Bordeaux mixture was used, others a falling off, and others absolutely no difference. The last published report is from the trial grounds of Messrs. Sutton & Sons, at Reading, from which it would appear that, if anything, the use of this mixture is to be deprecated. Experiments had been made on 278 kinds of Potato, which were planted in 810 rows. Half of each kind was dressed with the mixture, the other half left to take its chance Here is the result:

	Tons.	Cwts.	Qrs.	Lbs.
810 rows, dressed with the mixture, yielded....	4	17	1	1
810 rows, not dressed with the mixture, yielded..	5	8	2	5

Two of the varieties—namely, Sutton's Ringleader and White Beauty of Hebron—were one-third more prolific without the dressing than with it.

By the side of this report from Messrs. Sutton may be placed that from Mr. R. Fenn, well known as a raiser of potatoes, from which it appears that where the dressing was used the crop was about fifty per cent. better than when no mixture was applied. Mr. Fenn attributes the difference between the results he obtained and those obtained by Messrs. Sutton & Sons to his using the mixture in powder form instead of in the liquid, as recommended by the Board of Agriculture, and to his applying the mixture early.

Kew. *W. Watson.*

[Experiments in this country seem to have demonstrated that the Bordeaux mixture is effective against potato rot when the application is made early, and repeated several times. The copper mixtures are preventives, and hence the need of application before the spores of the rot have started into growth.—Ed.]

Cultural Department.

Notes on Small Fruits.

Several promising varieties of Raspberries are being tested at this station. Among them are the following Black Caps:

Lovett's Early is one of the earliest; the plants made a good growth last year, and gave a fine crop of fruit this season. The fruits are quite firm, of good size and appearance. The canes make a very slender growth, but are well branched. This will undoubtedly be a valuable acquisition. Carman has been fruited here two years, and proves the earliest of all Black Caps. The plants make a very vigorous growth, and produce a fair crop of fruits of high flavor and showy appearance, and firm enough to ship. This will, without doubt, become a favorite early variety when better known. A seedling sent out by G. C. Brackett, Secretary Kansas Horticultural Society, under the number 101, has proved itself a valuable variety, being a vigorous grower and productive; its fruits are of the largest size, jet-black and firm; it is in season about with Gregg. Among the older varieties the Hilborn takes the lead, with Smith's Prolific following close in regard to yield. Both of these have fine showy fruit of good quality, and are firm enough to bear shipment. For a late fruit nothing tested here will equal the Ada, a variety of great vigor and productiveness. It is rarely met with, and I fail to find it catalogued, but it should become better known. The Gregg through this section is still the favorite, both for market and canning, but I am of the opinion that either the Holborn or Smith's Prolific will equal it in productiveness, and prove more hardy.

Fig. 83.—Rosa multiflora, trained over a post.—See page 532.

Of the red Raspberries, Quinby's Favorite is one of the best, resembling in a marked degree Cuthbert both in growth of canes and the questionable habit of growing a large number of suckers. The fruits, however, average larger than Cuthbert, are deep red and very firm, but the firmness does not detract from the juiciness, and in flavor it resembles the Cuthbert. Two seedlings from William Parry, of New Jersey, Nos. 1 and 2, are both good, the No. 1 being early, vigorous in habit, fairly productive and of fine flavor; too soft to ship, but a good home berry. The No. 2 begins to ripen fruits in mid-season, and continues to bear for a long period. The berries are of large size, firm and of distinct winy flavor. I think this will prove a valuable variety when known. Stayman's No. 5, originated by Dr. Stayman, of Kansas, is also a very promising variety, throwing up large stools of canes; it is hardy and one of the most productive varieties. The fruits are dark red, large and quite firm. Of the older sorts Cuthbert still leads in productiveness, and, in my opinion, will stand at the head for some time to come. Thompson's Early Pride is a little earlier, and Pomona is larger, but, taking all things into consideration, the berry to supplant it will have to be a decided improvement on any grown at present. Something with the productiveness and hardiness of Schaffer, the size of Clark's or Pomona, and the firmness of Quinby's Favorite would be the ideal berry. Schaffer is the berry par excellence for canning, as its enormous yield enables those growing it to sell at a price below that at which other varieties can be sold, and its great merit to the canners is that it holds its color and shape better than any other.

Either the Caroline or the Golden Queen should always be found in an amateur's collection. Both of these are yellow and about equal in productiveness. The Golden Queen bears the larger and more showy fruits; the habit of plant is identical with Cuthbert, and it makes a dense growth of suckers; it is often killed back one-half in severe weather. The Caroline is extremely hardy, never showing any ill effects from cold weather and withstanding drought. The fruits of both of these varieties are very soft, and, owing to their color, soon look mussy, so that they cannot be shipped; but their superb flavor entitles them to a place in every collection.

Of the Blackberries, Agawam has given the best results thus far; it has proved perfectly hardy, able to resist drought and to mature all its fruits; it throws up a large number of stout canes well supplied with laterals, and while the fruits are not of the largest size, they are of good size and of fine flavor. The Erie is a very fine variety, giving a large yield of enormous berries that, when fully ripe, are as luscious as the old Kittatinny. Its habit of growth is stocky, and heretofore it has proved rust-proof. I think it a good substitute for the Kittatinny in sections where the latter cannot be grown. Last year it did not give very good results, and there were doubts about its value, but since this year's trial I am satisfied it will prove a good berry. The Snyder has not done as well here as elsewhere; while making a very vigorous growth, it has yielded but few fruits in the three seasons it has been under test. Early Harvest, Wilson's Early and Wilson's Junior are three very early varieties, of merit on account of their earliness where they can be grown profitably, but neither of them has given anything more than a small yield here.

Of black currants, Champion Black and Ogden's Black Grape are two of the best, the former being of dwarf upright growth and fairly productive. The fruits, which are of large size, are borne in short clusters. The Ogden's Black Grape is of spreading habit, and is very productive of large jet-black fruits. Both varieties ripen all their fruits at once, and have no green tips to the clusters, as is common with other varieties. The Crandall has proved utterly worthless here, the bushes growing beyond all bounds, but bearing only an occasional fruit, and those of only medium size and no special flavor.

Among red currants, Fay's Cherry and Prince Albert are the leading varieties; the latter is especially valuable on account of its late fruiting. It begins to ripen its fruit when the other varieties are ready to pick, and can be left on the bushes for a long time, as the foliage completely covers the bunches and keeps them from being scalded by the sun. Care should be taken in purchasing this variety, as there is a spurious strain of it in the market; this has the same dark green foliage and habit of growth, but with small fruits in short bunches.

Since we have been able to combat the Gooseberry-mildew successfully, the growing of the large-fruited foreign gooseberries has been revived, and now the only excuse for growing such varieties as the Houghton or Mountain seedling is the ignorance of better kinds. All things considered, I should place Triumph at the head of the list of large-fruiting varieties; but Industry, Wellington's Glory and Whitesmith are also fine, giving a large yield of delicious berries as much superior to our native varieties as a Seek-no-farther apple is to a Baldwin.

Geneva Experiment Station, N. Y. *C. E. Hunn.*

The Hardy Flower Garden.

WHATEVER work remains to be done in this department should be pushed forward with all speed, as the soil is rapidly losing warmth, and the planting of herbaceous plants is dangerous if delayed too long. They do not take root in the cold soil, and are often lifted by the action of frost and killed before one is aware of it. Too much stress cannot be laid on the fact that for a considerable period in fall the soil is much warmer than the atmosphere, as may be easily ascertained by testing the matter with a thermometer, and this condition is very beneficial in establishing fall-planted bulbs and herbaceous plants, and, although herbaceous subjects are planted in larger quantities in spring, it is by no means the best season, as in spring root-action commences as soon as the frost leaves the ground, and it is more or less interrupted by transplanting at that season, however early it may be done.

When Lily-planting is contemplated the present time is the best possible if native-grown bulbs are to be used, but if imported bulbs are desired they cannot be had for several weeks, as the new stock has not arrived, and, in fact, does not arrive until too late for planting in the majority of cases, as, for instance, the Japan varieties, which are more in request than other kinds, and, taken as a class, imported ones are much more satisfactory, with perhaps one or two exceptions, as, for instance, *Lilium auratum*, which no one has taught us as yet how to grow and keep. With the exception of *L. auratum*, home-grown Lilies may be planted now, and better flowers will follow than if later plantings are relied upon. The sooner the bulbs are planted the stronger will be the root-action from the base of the bulb; this is always poor when planting is done in spring, as the bulb has then to depend largely for subsistence upon the roots formed along the stem, and these have plenty to do to nourish properly the stalk and flowers. The depth to plant Lilies must depend largely upon several details which it is well to consider here; but, at the same time, it must be admitted that there never was a truer word spoken than that horticulture is necessarily "empirical." Experience does teach, and it is not all gained in a day, and seldom is Lily-culture fully mastered. I have noticed that some varieties with small bulbs will succeed well with shallow planting, as for example, *L. Wallacei*, *L. callosum*, *L. elegans*, and, emphatically, *L. Philadelphicum*, which always grows near the surface when found wild, while others with small bulbs, as, for example, *L. Columbianum* and *L. tenuifolium*, need deep planting.

A well-known Lily-grower once told me that people thought that because *L. tenuifolium* came from Siberia it would stand any degree of cold; but they forgot about the deep covering of snow by which the bulbs were protected on the approach of winter. Hence the saying that this beautiful Lily is best treated as an annual. *L. tenuifolium*, however, is not nearly as good as *L. pomponium*, which is not so well known, but produces more flowers of the same color, and fragrant, too, and it improves year after year under cultivation, so that we can well spare the Siberian species. *L. Columbianum* comes from the Pacific Coast and succeeds but poorly here in the east. I have only flowered it when planted ten to twelve inches deep, and the same remarks apply to *L. Washingtonianum* and *L. Humboldtii*. They are both beautiful but are seldom seen. Even when once planted in the garden they have a provoking way of lying dormant for eighteen months before trying to flower, and they usually die in the attempt. *L. excelsum* is a very distinct Lily, and is regarded as of hybrid origin as it has never been found growing wild. It should always be tried as it sometimes succeeds as well as *L. candidum*, while the color is unique among Lilies—a light buff. *L. Szovitsianum* is another beautiful Lily seldom seen, though it sometimes succeeds well, but when it does it is not soon forgotten; the flowers are bright lemon-yellow. *L. Martagon* is another difficult Lily to grow, but I believe it needs stony soil, preferably elevated, as on rock-work, to make it comfortable. It is the true Turk's-cap Lily.

While the foregoing may be regarded as the shady side of Lily culture, there is still a bright side and a very sunny one it is. We must thank Japan for it to a great extent, for most of the Japan Lilies are perfectly at home here, and in some cases, as with the Tiger Lilies, we may often see them naturalized as escapes from gardens. *L. speciosum* and varieties, *L. tigrinum* and its varieties, *L. Batemannæ*, *L. Thunbergianum* (or *elegans*), *L. Hansoni*, *L. Japonicum* and its

variety Brownii, with perhaps *L. Leichtlinii*, constitute the majority of Lilies that can be grown outdoors here, and all are of Japanese origin. It is not generally known that the well-known Easter Lily can be grown and flowered in the open border equally as well as in the greenhouse if the bulbs are wintered in a cool cellar and planted out in spring. I refer to *L. longiflorum* and its variety Harrisii. *L. candidum*, the Madonna Lily, is perfectly hardy and needs no commendation. There are still three native Lilies that are worth growing in the garden as they improve so rapidly when given a moist soil and are very ornamental—*L. superbum*, *L. Canadense*, and *L. pardalinum*, the latter a western Lily but perfectly hardy here. As to planting, one cannot do wrong with those noted since they grow well here if they are planted eight or ten inches deep even where the soil is heavy, for this will save the young shoots from injury from frost in the spring; but with those that do not succeed well in all places it is best to try them in all positions available, being assured that when success is attained it will be worth recording.

South Lancaster, Mass. *E. O. Orpet.*

Andromeda speciosa for Forcing.

THE singular beauty of *Andromeda speciosa* as a dwarf flowering shrub has often been spoken of in Garden and Forest, but it ought to be said in addition that this promises to be one of the very best of shrubs for forcing. It is an Ericaceous plant, a native of our southern states from North Carolina to Florida, where, in the Pine-barrens, it reaches a height of two to four feet. Although not as hardy as many other North Carolina plants, it does fairly well in any sheltered position here. At the Botanic Gardens in Cambridge it has flourished in the same place for twenty years, and probably longer, without any protection; and it will certainly do well in more exposed places if pegged down to the ground and lightly covered with soil. To all lovers of beautiful plants it will repay this slight trouble.

When used for forcing it rivals many of the Heaths with its large white bell-shaped flowers, which are often half an inch across. For forcing purposes the plants do best when lifted early in September, potted firmly and kept in a close frame or greenhouse, and well syringed until established in the flowering pots, which will be in a fortnight or three weeks. They should then be put out-of-doors to harden up until heavy frosts are expected, when they can be placed in a frame or pit until wanted for use. The first lot may be brought into heat about the first of December, and afterward as they are needed. With a temperature of fifty degrees Fahrenheit at night and from ten to fifteen degrees higher during the day they will begin to flower in a month or six weeks. As soon as the flower-buds begin to show, several good waterings of liquid manure should be given, which will make the flowers much more substantial. When the plants have been once forced and are kept in pots during the summer, they will flower much more freely than they do the first season after they are taken from the open ground. This Andromeda is slow to propagate from cuttings. For this purpose forced wood, kept under double glass, is the best. From seed it is as easily raised as Rhododendrons. It grows slowly the first year and begins to flower the third year. The buds are formed in the fall on the terminal shoots in the axils of the leaves. As the plant grows late in moist seasons, this growth is not always well ripened; hence the necessity of covering the plant in exposed places.

Arnold Arboretum. *Jackson Dawson.*

Limnanthemum Indicum.—A charming little aquatic under this name was introduced into this country last year by Mr. E. D. Sturtevant, of Bordentown, New Jersey. The leaves are roundish, heart-shaped, bright green, about three inches across, and float upon the surface of the water. The pure white flowers, with a faint tinge of yellow in the centre, ascend in clusters of several from the petiole, at the point where it joins the blade of the leaf, each borne erect on a slender stalk some two or three inches high. They are rather more than an inch in diameter, and the five radiating petals, of oblong outline, are so densely covered with hair-like material as to present a curious and pleasing woolly appearance on the upper surface. Mr. Sturtevant gives it the common name of Water Snowflake—a name as appropriate as pretty—and speaks of the flowers, from their hirsute decorations, as rivals in miniature of Mrs. Alpheus Hardy Chrysanthemums. I saw several plants of this novelty last September in the gardens of Mrs. H. M. Brooks, at Newport, Rhode Island. They had been planted in four-inch pots and then placed in a tub, a few inches below the surface of the water. The plants were full of flowers, and thriving with great luxuriance in the shade afforded by the vines in a grapery. The gardener, Mr. James Hill, assured me that they had flowered very freely all through the summer. He seemed to be much pleased with the tiny stranger, and said it required little care beyond good soil and an occasional change of water. A rich sandy loam, with a little old manure, is perhaps the best compost that can be devised for this and all similarly delicate water-plants. *L. Indicum* is very variable, and it has several synonyms. *Villarsia Indica*, *Nymphæa ceramica* and *Menyanthes Indica*, all doubtless refer to the same plant. Mr. Sturtevant's plant is most probably a variety of that figured in the *Botanical Magazine* under the latter name. The deep yellow color and somewhat smaller size of the flowers there illustrated are the only perceptible differences in the two plants. *L. Indicum*, in one or more of its numerous forms, occurs in Australia, Asia, and south Africa. A white-flowered variety appears to have been the first cultivated in English gardens; it was introduced from the Cape of Good Hope in 1792. *M. Barker.*

Cambridge, Mass.

Plumbago Larpentæ.—This little plant must be ranked among the best of those that flower late in autumn. It is quite distinct from anything in bloom at that time, and perfectly hardy. The slender stems are from nine to twelve inches in length, and furnished with numerous, rather pale-green, alternate, obovate leaves, which are sessile and taper to the base. The plant soon becomes a dense cluster of stems and leaves, spreading with great rapidity, and is completely covered with a sheet of intense blue during August, September and the greater part of October, lasting, indeed, until frozen. The spreading flowers, three-fourths of an inch in diameter, are borne in compact terminal clusters. *P. Larpentæ* is a charming plant for the rock-garden, and thrives even more satisfactorily in the herbaceous border. The rockery affords the nearest approach to its natural habitation, generally old walls or similarly exposed situations. It is much more vigorous with full exposure to the sun, and appears to better enjoy a deep, rich loam. The roots under such conditions descend to a considerable depth, and are got at with some difficulty when required in early spring for propagation by division, that method being the best. *P. Larpentæ* is somewhat rare in China, of which country it is native. It was first discovered by Mr. Fortune in the vicinity of Shanghai. He failed, however, in his effort to introduce it on behalf of the Horticultural Society of England; but a plant which survived was dispatched soon after, in 1846, by a Mr. Smith to Sir George Larpent. This specimen flowered a year later, and was awarded a prize at a meeting of the Horticultural Society. The plant was afterward described by Dr. Lindley, and named in compliment to Lady Larpent. It was thought, a year or two after its introduction, that *P. Larpentæ* would prove valuable for bedding purposes and speedily become popular, but after more than forty years' acquaintance with its highly meritorious qualities, the plant is still comparatively uncommon. Many of these long-neglected plants are now rapidly coming into favor, and there seems to be no reason why *P. Larpentæ* should not at last receive the attention it so well deserves. *Plumbago Larpentæ* is the name that was first given to the plant, and the one under which it is most generally known. The correct name is *Ceratostigma plumbaginoides*, however, and *Valoradia plumbaginoides* is another synonym.

Montclair, N. J. *S.*

Good Dessert Apples.—Two of our best winter dessert apples are Snow, or Fameuse, and Jonathan, both small in size. There are peculiar advantages in small apples for table use if they are handsome and high-flavored as these are. Few people, either before or after a hearty meal, want large apples, and as a rule do not eat more than half of a Spy or a Baldwin. For cooking the case is different; yet even there it is a mistake to choose very large fruit. The loss from decay of a single Jonathan is very small. Both the fruits named are excellent keepers. The Fameuse is good for October, November and December; the Jonathan will serve finely through January, February and March.

The Wagner is comparatively little known, but it is a remarkable apple both for beauty and quality. The flavor is wild but clear and distinct, and the juice is very refreshing. The Rhode Island Greening is a first-class apple, that is, those specimens are which have a bright golden nut-tint. This color comes in fruit in open lots where the tree gets abundant sunshine. Any apple grown in a close orchard is inferior to those produced in open ground, but this is peculiarly true of the Greening—the contrast is often striking. The Northern Spy is

another example of an apple that may be almost unsurpassed or may be nearly worthless for the table. The flesh of the best is almost a yellow, and the skin finely tinted but not a bright yellow and red. Apple-trees that bear the best fruit are those that stand in pasture lots, or by the fences, or on our lawns as shade trees.

Clinton, N. Y. *E. P. Powell.*

Correspondence.

A Rhode Island Forest.

To the Editor of Garden and Forest:

Sir,—I have lately paid a visit to the plantations of Mr. Henry G. Russell, of East Greenwich, Rhode Island, and as they represent what is the most important experiment in silviculture that has been made in New England in the last twenty years, some account of the results which Mr. Russell has already obtained may be interesting to the tree-loving readers of Garden and Forest.

Mr. Russell's plantations stretch in a rather narrow belt for a distance of two or three miles along the north and north-west shores of Greenwich Harbor, a considerable inlet from Narragansett Bay. The situation is bleak, exposed, and wind-swept; the soil is naturally light and sandy, and what little plant-food the upper layers ever possessed was long ago exhausted by continuous cultivation, first by the Indians who frequented this point to feast on the clams which line its shores and the fish which still abound in the waters which surround it, and then by their white successors. That the soil, in spite of the poverty of the surface, possesses the power to produce good trees is shown by the great Oaks, both White and Black, which are scattered over some parts of Mr. Russell's estate, and by the remarkable growth made by some of the trees in his plantations. The first of these was made in 1878, Mr. Russell having determined to protect his fields by a belt of timber on the shore side. The work has been carried on gradually, the experience gained in one year being used to the advantage of the plantations made the following year. Nearly one hundred and fifty acres in all have now been planted, and the whole coast-line of the estate is lined with trees.

Mr. Russell, like most American planters, made his first attempts with foreign trees, of course with Scotch and Austrian Pines and Norway Spruces. Their worthlessness is already demonstrated, although the largest of the Pines, which are fast dying or blowing over, supply the farm with about all the firewood it consumes. It is interesting to note that large numbers of self-grown seedling Scotch Pines have been springing up in the plantations during the last three or four years from seed scattered from trees now only thirteen years planted.

The European Larch has done better than the other exotic conifers, and has proved one of the best trees planted at East Greenwich. The growth the Larch has made on this sterile soil is remarkable. The writer of this letter was in East Greenwich during the summer of 1878 and pulled up one of the newly planted Larches and wore it in his buttonhole during the day, much to the amusement of some of Mr. Russell's neighbors, who were inclined to look upon his efforts at forest-making with that incredulity with which country-bred New Englanders are apt to regard every innovation in old-time customs. The companions of my boutonnière of thirteen years ago are now stout trees from twenty-five to thirty feet in height, with trunks each thick enough to make two good fence-posts, and the neighbors are not laughing at Mr. Russell as a tree-planter as much as they were, but are themselves planting trees. In 1879 Mr. Russell wanted to try planting the Larch in autumn, and sent to Robert Douglas & Sons, of Waukegan, for one of their dollar packages containing a hundred trees. The package was six or seven inches long and perhaps three inches in diameter; the trees were set on an exposed point, and now they vary from twenty to twenty-seven feet in height. The Larch and the White Pine supply seven-eighths of the material used by Mr. Russell in his plantations. The Larch has grown rather the taller of the two, but the Pines have formed stouter trunks and have probably made more wood, and some of the youngest plantations are composed of White Pines exclusively. They grow with great vigor even in the most exposed situations, but have suffered from the attacks of the Pine louse, and from the Pine weevil which has destroyed the leaders on thousands of trees. Whale-oil soap applied with a syringe has checked, although it has not exterminated the louse. The weevil is a more serious enemy, as its presence is not noticed until the damage is done. The tops of all young trees injured by it are now systematically cut off and at once burned, so that its ravages are likely to decrease. The Douglas Spruce, raised from seed gathered in Colorado, has also proved an exceedingly hardy and valuable tree at East Greenwich, growing almost as rapidly as the White Pine and developing as yet no disease or insect enemy.

Various methods of planting have been tried, it being Mr. Russell's intention to make his place valuable as an object-lesson to the public. Plantings of pure Larch and of pure White Pine have been made and the two trees have been mixed together in different proportions. One of the most promising of the mixed plantations is composed of Larch set four feet apart each way with a White Pine in place of the fourth Larch, so that the Pines stand sixteen feet apart each way. As these have grown the Larches nearest them have been gradually cut away, with the intention of leaving the Pines to occupy eventually the ground.

Two sand-holes, each several acres in extent, near the end of the point, and therefore in an exposed situation, had for years been gradually spreading, and threatened to extend over a large area. It was a difficult and tedious undertaking to cover and fix the surface and so prevent the sand from working inland. This has at last been accomplished by covering the surface with brush and then by planting it thickly with seedling Pines, the Ailanthus, and other trees.

Mr. Russell has found that the best method of planting is to run shallow furrows four feet apart, each way, and then to set three or four-year-old transplanted seedlings at the intersections of the furrows. The land is so poor that weeds do not grow vigorously enough to interfere with the young trees, and they do not require or receive any care or cultivation after planting. For many years Mr. Russell has been planting acorns, principally of the White Oak, among his conifers with a view of securing a succession of forest-growth in case the original trees should be destroyed by fire or other causes. The experiment has been successful, as thousands of young Oaks now bear witness. Some of these, where light has been allowed to reach them by thinning surrounding trees, are five or six feet high and are growing rapidly and vigorously. Acorns were put in with a cane at a trifling expenditure of labor and money, and among the trees which have sprung from them are some which may be expected to flourish for the matter of a century or two after the last of the conifers which now surround and overtop them has disappeared.

The transformation which the plantations have made in the short period of thirteen years is astonishing. Standing now north of the mansion house and looking in the direction of the town of East Greenwich what appears to be an endless forest of waving Pines backed by high hills covered with the slender spires of countless Larches meets the view in place of the ugly, straggling wooden town with its squalid water-front. It is not easy to imagine a greater change or to realize how short has been the time since these trees came into life. At the beginning of the undertaking the plants were brought from the Douglas nursery on the shores of Lake Erie, but of late years Mr. Russell has established home nurseries in which his material is raised, so that the visitor can see here all the operations of tree-planting—beds filled with seedlings, the plantations made last spring (some twenty-five acres) and those of each previous year, and note the condition and rate of growth of the different trees.

Mr. Russell set out to do two things: by planting, to protect his estate from cold winds which were gradually blowing it away; and to show the possibility of making trees grow under what appeared singularly trying and difficult conditions. He has been more than successful in both. The attractiveness and value of his farm is greatly increased by his planting, and he has reared a forest which is more interesting and suggestive than anything of the sort east of the Missouri River. Its value as an object-lesson cannot be overestimated, and Henry G. Russell must stand as one of the foremost educators in rural economy that America has produced. But in doing this he has done something for himself which he, perhaps, never dreamed of twenty years ago—he has created in himself a real and living interest which will last as long as he lives. Among his trees he finds occupation of which he never tires; his greatest pleasure, he tells his visitors, is to go out and "get lost in his woods"; to pass long days among them, studying the trees, marking those which are to be cut, pruning his young Oaks, planning for new plantations, and finding that communion with Nature which is the greatest blessing that can come to any man however great may be his attainments or splendid his possessions.

Providence, R. I. *Davis.*

Exhibitions.

Chrysanthemums in New York.

In one respect the Chrysanthemum show in Madison Square Garden last week was far ahead of any exhibition of flowers which has ever been held in this city. It was a remarkable success financially, and this fact carries with it the promise of the annual recurrence of this festival, with the offer of premiums large enough to reimburse exhibitors for the very considerable expense of preparing and transporting the material for exhibition to the Garden. Last spring a beautiful show was opened to the public at the Lenox Lyceum, but no one went to see it, and heavy bills remained to be met by the local florists' club. This fall the Madison Square Garden Company took the matter in hand through their manager, Mr. Morrissey, who is trained to the business of organizing exhibitions, and by skillful advertising he brought crowds to see the flowers, and Mr. William Plumb, representing the Florists' Club, saw to it that the visitors found something to pay them for their trouble. Good music was furnished every day and evening, the flowers were renewed as they began to fade, and the interest was sustained by novelties up to the close of the week.

It was really a Chrysanthemum show. Orchids were exhibited, it is true, and admirable collections they were for the season, by Siebrecht & Wadley and Pitcher & Manda. Here, too, were large groups of Palms and Ferns from the same exhibitors, and a strikingly beautiful table of Ferns from Mr. Dreer, of Philadelphia. Nor were Roses lacking, and they were of excellent quality, as might have been expected from such growers as F. R. Pierson Co., J. N. May, Ernest Asmus, S. C. Nash and J. H. Taylor. There were Carnations, too, and a special day for Mignonette and Violets, while the mass of French Cannas, by Mr. James Dean was most instructive as suggesting the possibilities of these flowers for winter decoration. But after all, the greater portion of the immense exhibiting space was devoted to Chrysanthemums, and largely to cut flowers, and the exhibition seemed rich and varied in spite of the absence of the neat little Pompons, the Anemone-flowered varieties, and the true incurved or Chinese sorts which were very sparingly shown.

Of specimen plants naturally grown, like those we are accustomed to see at exhibitions in Philadelphia, there were none, if we except a single plant of the variety called Daisy from the collection of Messrs. Pitcher & Manda. This was a well-grown plant completely covered with pure white and almost single flowers which resembled large Ox-eye Daisies. The best-flowered plants in pots were those from Mr. Adolph Ladenburg, who won the first prize for a collection occupying a space of not less than 250 square feet and arranged for effect. These were tall plants, in ten-inch pots, placed close together, each one bearing a few flowers, but so perfectly developed that many of them would have ranked among the best of any class. Indeed, there were no blooms of the variety Lilian Bird exhibited which equaled those on Mr. Ladenburg's plants. The prizes for standard plants were taken by Pitcher & Manda and Mr. Spaulding. A great number of remarkably good plants grown with a single stem were also shown by Mr. Spaulding, but discordant colors were mixed up in such a way that the decorative value of the flowers was obscured. Of course it is impossible in an exhibition like this to arrange plants so as to achieve the best pictorial effect of the display as a whole. It would be a different matter if the plants were contributed for the purpose of decorating the Garden, so that they could all be placed according to some comprehensive artistic design. As it is, the plants come in classes for competition, and this necessitates some stiffness in the details of the arrangement. But, after all, there were flagrant conflicts of color which might have been avoided in several parts of the Garden.

It was owing to some shortcomings of this sort that the visitor on entering the garden experienced a sense of bewilderment and confusion, but after he had become accustomed to the glare and could note the details of the exhibition it was plain that this surpassed all former shows in this vicinity in the great profusion of well-grown flowers. These were to be seen not only on the exhibition boards, but in all directions, and in all available spaces there were splendid flowers with long stems, well furnished with luxuriant foliage. The collection of varieties in vases, a new feature here, was alone sufficient to establish the character of the exhibition. These collections were composed of noble flowers with long stems, each variety loosely arranged in a large tall vase. Almost every group of flowers was a study and fit to decorate a palace. Never before have the capabilities of the Chrysanthemum been so effectively displayed in this city as in this class, where their highest effectiveness was brought out in arrangements of one color. Such a display will do more to popularize the flower than any other form of exhibit which has yet been devised. These flowers were from Peter Henderson & Co., Ernest Asmus, J. N. May, J. Roehrs, Dailldouze Brothers, Flatbush, J. H. Taylor, Bayside, and when it is remembered that the exhibitors are market growers and that the flowers, though their best, were not specially grown for exhibition, it will be understood that the culture of the Chrysanthemum is well understood here. The flowers were deep and full and averaged about six inches in diameter. The varieties which seemed to be most useful to this class of growers, judging from those shown, were the following: White—Mrs. Alpheus Hardy, Jessica, Miss Minnie Wanamaker, Domination, Ivory, Robert Bottomley. Yellow—W. H. Lincoln, Harry Widener, Gloriosum, Rohallion. Pink—Mermaid, Mrs. J. N. Gerard, Excellent, Ada Spaulding, Bride of Roses, J. R. Pitcher, Syringa, and a few darker colors, as Ed. Molyneaux, Mrs. Irving Clark, Moseman, Louis Boehmer, but the whites, yellows and pinks were in the largest numbers. It should be said that the flowers of Mrs. Alpheus Hardy, which somehow have hitherto failed to fulfill the wonderful promise of its introduction, were marvels of beauty as shown in this class, pure in color, refined in texture, perfect in form, but lacking somewhat in strength of stem. They were shown by Peter Henderson & Co.

There were a very few vases with mixed varieties, the most noticeable one, shown by J. Brydon, of Yarmouthport, Massachusetts, containing the best-grown flowers in the entire exhibition, each one being perfect in color, depth and solidity.

On Monday the competition in cut blooms was keen and the classes well filled. The first prize for fifty varieties went to E. A. Wood, West Newton, Massachusetts. These flowers were staged in glasses, with stems a foot long, showing foliage, the latter an innovation which, it was rumored, had influence with the judges. The flowers were good enough, however, to win on their merits. It is worth noting that on the next day the foliage had mostly wilted. The culture of the Chrysanthemum as a greenhouse flower seems to result in making the leaves very susceptible to change of temperature. The first prize for twenty-five flowers, and also for twelve, was taken by Dailldouze Brothers, while the first for twelve Chinese and twelve Anemone-flowered varieties went to William Tricker.

The stand of twelve contained Gloriosum, G. F. Moseman, Viviand Morel, Magicienne, Domination, Jessica, Sunflower, Excellent, Mrs. J. N. Gerard, Ivory, Ed. Molyneaux and Mermaid.

A very good show of twelve, and one of twenty-four were made by an amateur, F. T. Underhill, Oyster Bay, Long Island, who also secured the Havemeyer Cup.

Ernest Asmus captured the first prize for six blooms with Minnie Wanamaker, Mary Wheeler, W. H. Lincoln, Mermaid, Rohallion, Jessica.

The prizes for new seedlings not yet in commerce brought together a large number of promising flowers; a few of exceptional merit and great gains. The Mrs. Herman Oelrichs Cup was awarded to Thomas Griffin, gardener to Mr. A. Ladenburg, for Emily Ladenburg, a fine incurved flower, velvety red, inclining to a mahogany shade, a nearly pure self color, the reflex being very dark. If this seedling holds its present character it will be a great gain. The Mrs. Henry Clews Cup went to J. Brydon, Yarmouthport, Massachusetts, for Miss Mabel Simpkins, an incurved white in the way of Ivory, but more pointed. The Mrs. W. C. Whitney Cup, for a pink variety, was given to Mr. E. G. Hill for Edward Hatch, an extra-large globular flower with wide petals. This was also certificated. The Mrs. Edward Winslow Cup and certificate were given T. H. Spaulding for E. Hitzeroth, a large lemon-yellow flower.

The Mrs. J. F. D. Lanier Cup was taken by Pitcher & Manda with Harry May, a very solid and large bronze incurved flower, which was also certificated. The Mrs. A. Ladenburg Cup was well bestowed on Mr. T. H. Spaulding for H. F. Spaulding, a large incurved apricot variety. Very distinct. The Miss Bird Cup was also taken by Mr. Spaulding with Colonel William B. Smith, a fine yellow flower flecked with red. To Mr. Spaulding also went Mrs. Astor's Cup for the best collection of flowers not yet in commerce.

First-class certificates of merit were awarded Messrs. Pitcher & Manda for Mrs. E. D. Adams; to J. Brydon for Snowflake and Brydon, Jr.; to Robert Craig for Maud Dean, a beautiful pink flower, O. P. Barrett, a mahogany red, C. B. Whitnall and Mrs. Robert Craig. There were numerous other seedlings of more or less merit, the best of which were probably Ruth Cleveland and Lillian Russell, both pink, and well

shown in large vases by Mr. Spaulding. I. Fostermann had a large collection of new and promising varieties.

The most interesting groups of plants were those composed respectively of single masses of Puritan and M. Boyer. Some more ambitious groups emphasized the fact that a casual mixture of colors produces spottiness, and not a pleasing effect.

Table decorations were shown Thursday by Brower Brothers, Siebrecht & Wadley and Charles A. Dards. In each case very large well-grown flowers were used in lavish profusion, and the tables seemed overloaded, so that the effect was rather heavy, though somewhat toned down by artificial light.

One of the most interesting exhibits to the Chrysanthemum-fancier was Mr. T. H. Spaulding's collection of new Continental varieties, including some of S. Delaux's new early varieties, the offering of which was the most important event of the year among Chrysanthemum-fanciers. A glance over these showed many promising things. The serious feature of the introduction of so many new varieties is that so few of them are ever seen at their best or grown after a year or two.

Notes.

In Orange County, California, a single grower this year has sold 115,000 spikes of Pampas-blooms.

The estimated cost of the horticultural building for the World's Fair in Chicago, which will measure 1,000 x 230 feet, is $226,890.

The Danish citizens of Chicago are collecting funds for the erection, in Lincoln Park, of a monument to Hans Christian Andersen.

The 133 free concerts given in the parks of New York during the past summer afforded pleasure to scores of thousands of people whose opportunities for refreshment are few, and cost the city the moderate sum of $14,987.

The care taken to obtain artistic designs for public grounds in Europe is shown by the recent action of the municipality of Breslau, in Silesia, which has offered three premiums, amounting respectively to 1,500, 1,000 and 500 marks, for the best design for a small urban park.

Dr. Wallace writes in *The Garden* that when he first imported Japanese Lilies twenty years ago the bulbs were obtained with difficulty, since they were either gathered wild in the mountains, as was the case with *Lilium auratum*, or picked up one by one in Japanese gardens. Of late years, however, the Japanese have turned their attention to Lilies as an article of commerce, and bulb-farms, like those in Holland, are in successful operation and Lilies are cultivated by tens of thousands. The result of this is that the bulbs which come over are far better individually, and the varieties are greatly improved on account of careful search and selection through the numerous islands of Japan.

Circulars were recently sent by the Department of Agriculture in Victoria, Australia, to all the schools in non-metropolitan districts, asking whether their head-teachers would advocate the teaching of the elements of agriculture and horticulture. The replies showed that eighty-four per cent. of the 1,248 teachers in question were in favor of the idea, and that in thirty-four per cent. of the schools such instruction was already being given. In fifty-two cases the scholars were caring for trees or gardens on the school-grounds, and most of the children in 369 other schools were either assisting their parents in horticultural work at home or caring for garden-plots of their own. In 161 schools the pupils were in the habit of making collections of local plants and insects to be subsequently used as object-lessons in the classes.

A correspondent of the *Evening Post*, of this city, recently wrote that, in spite of the scarcity of true Spruce-gum in Vermont, resulting partly from forest-fires and partly from the increase of saw and pulp-mills, the gum-picker is still a picturesque figure in the remoter districts of the state. "The most famous one is Alonzo K. Bishop, of Woodford. In winter carrying a bag slung over his shoulder, Bishop roams all over the Green Mountains examining Spruce-trees. With a long pole ending in a sharp chisel, he detaches the gum. His journeys often take him many miles from human habitations. When the hills are snow-covered, Bishop still pursues his industry, traversing the country on snow-shoes. He sells the gum for fifty cents to $1.50 a pound, according to quality. The purest gum is transparent, or of a light amber color, filled with minute bubbles of air. Vermonters who have made new homes for themselves in the west consume a great deal of the pure article, which is sent to them by friends through the mails."

Mr. Emory E. Smith, in a paper read before the California horticultural societies, urges the gardeners of that state to give more attention to the improvement of the wild strawberries of the Pacific Coast. He considers them among the most promising of wild fruits there, and little has been done with them in the way of selection or hybridizing. The eastern varieties introduced in California need to be constantly irrigated, and it is believed that improved plants of native parentage would be better adapted to the conditions of the climate. One species, *Fragaria Californica*, often occurs in the driest and most unpromising locations. Besides this, although the eastern strawberries raised under irrigation are very large and finely colored, they are really flat and flavorless, while the native berry in that climate has a delightful sweetness and aroma. The fruiting season of the California native berries is very long. In favorable seasons in the neighborhood of San Francisco *F. Chilensis* gives fruit from January until August, and *F. Californica* in the same section will fruit until the middle of July.

A correspondent of *The Garden*, London, invites attention to *Clematis graveolens*, which he says is rarely met with outside of a botanical garden although it was introduced from Chinese Tartary half a century ago. This plant is not so scarce in American gardens, and yet it is one which should be planted more frequently here than it is. It is quite hardy and will climb to a height of ten or a dozen feet, and its single yellow flowers are an inch across and beautiful, although in no way striking. The heads of fruit, with their long silky tails, are, however, highly ornamental and will cling on the plants until the winter. It is, indeed, a matter of surprise that experimenters who are now hybridizing so many different species of plants have never taken in hand this and some of the other Clematises. With a plant which, like *C. crispa*, gives an abundance of purple flowers all through the summer and autumn months, and another, like *C. graveolens*, which also blooms for a long time, with *C. paniculata* and its abundance of white bloom in September, not to speak of *C. coccinea*, *C. integrifolia* and many more, remarkable results might be reasonably expected.

According to a recent writer in *Gartenflora* the so-called Century-plant (*Agave Americana*) was introduced into Europe during the first century after the discovery of the New World. The blooming of one specimen is recorded as occurring at Avignon in 1599, and of another at Montpelier in 1647, while even as far north as Wurtemberg a specimen was seen in the latter years of the sixteenth century, the flower-stalk of which measured over twenty-four feet in height and more than two feet in diameter. A story is told of one which, in some town of Languedoc, under the eyes of Louis XIII. and Cardinal Richelieu, threw up a flower-stem twenty-eight "hand-lengths" in height during the space of thirty-six hours, so greatly to the astonishment of the king that he decreed the "bewildering stem" should be painted by "some admirable painter." The first illustration of *Agave Americana* was published by Lobelius, who died in the same year as Shakespeare. One does not often realize, perhaps, that in the far-off days of Good Queen Bess American plants were already known in England as well as on the Continent, some of them being almost familiar objects, while as yet there were very few Americans except such as wore red skins.

Catalogues Received.

Dammann & Co., San Giovanni a Teduccio, near Naples, Italy; Wholesale Catalogue of Flower and Vegetable Seeds, Farm Seeds, Seeds of Trees and Shrubs, and Flower Bulbs.—Haage & Schmidt, Erfurt, Germany; Novelties in Flower Seeds for 1892.—Hartman Manufacturing Company, Beaver Falls, Pa.; Hartman Wire Panel Fence, Steel Picket Fence, and Wire Mats.—Harlan P. Kelsey, Linville, North Car.; Wholesale Catalogue of Native Trees, Flowering Shrubs, and Herbaceous Perennial Plants of the Southern Alleghany Mountains and the Southern States.—E. H. Krelage & Son, Haarlem, Holland; Darwin Tulips.—Thomas Meehan & Sons, Germantown, Philadelphia, Pa.; Ornamental Trees, Vines, Shrubs.—William Paul & Sons, Waltham Cross, Herts, England; New Roses.—Richard Pfau, San José de Costa Rica; Trade Catalogue of New and Rare Central American Orchids.—Reasoner Bros., Manatee, Fla.; Tropical and Semi-Tropical Fruit Plants, Economical, Medicinal and Useful Plants, Aquatics, Palms, Orchids, etc.—Frederick Roemer, Quedlinburg, Germany; Novelties in Flower Seeds for 1892.—J. C. Schmidt, Erfurt, Germany; Novelties in Flower and Vegetable Seeds.—William Stahl, Quincy, Ill.; Excelsior Spraying Outfits.—Stark Bros., Louisiana, Mo.; Wholesale Price List of Fruit, Ornamental and Evergreen Trees, Small Fruits, Shrubs and Roses.—W. Thompson, 34 and 36 Tavern Street, Ipswich, England; Flower Seeds.

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The Report of the Secretary of Agriculture.

THE current work of the Department of Agriculture during the year that is past has been made the subject of record and comment from time to time in this journal whenever that work related to subjects which are of special interest to its readers, but the annual report of the Secretary, which has just been issued, suggests a rather more comprehensive note. We are not concerned now with the general statistics of crop-values for the year, although it is a matter of congratulation that, in spite of the unusual abundant yields, prices of agricultural products, especially of cereals and animals, have been so well sustained that the increase in the wholesale value of these products when compared with those of last year, at the prices then current, amounts to $700,000,000. The most important way in which this department can aid horticulture in its various branches is through the labors of experts who are employed by it in the various fields of study and experiment. Of course, the department can aid horticultural pursuits on their commercial side in other ways, as, for example, by furnishing accurate statistics as to crops in this and other countries, perhaps by disseminating new varieties of fruit and other plants of economic value, by the suppression of fraudulent substitutes for and the adulteration of agricultural products, and by the actual help in the extermination of plant disease and of insects which are injurious to crops. But, after all, the distribution of information which is of practical value to horticulture is a matter in which we are all primarily interested. In order to ensure work of the highest character in this field it is essential that expert talent of the first order should be employed, and it is gratifying to note that many of the divisions of this department are under the control of men who take rank with the best in the republic of science, and they have exerted an influence which has already been felt in one way or another in almost every farm and garden of the country.

It may be worth while to make brief mention of the kind of work which is being done in the department, omitting such important divisions as the Bureau of Animal Industry, and others which relate more strictly to agriculture. Under the care of the Chemical Division the manufacture of sugar has been the subject of study, and an experimental station for the production of beets of a high saccharine richness has been established in Nebraska. Scientific methods of cultivation have been pursued for the purpose of growing beets of a large sugar-content, for the production of seed, and the establishment of a race of plants which equal or excel in quality the sugar-beets of Europe. Two stations have been established in Kansas—one in order to develop a higher grade of sorghum-cane for sugar-making, and the other to illustrate the possibilities of the alcohol process for producing sugar. The investigation in regard to the adulteration of food, especially of syrups and honey, tea and coffee, has brought to light many fraudulent, and some highly deleterious practices.

In the Division of Entomology, the most interesting work has been the importation of a parasite which infests the Hessian Fly, and of another one to help in the suppression of the Cabbage worm. Both of these attempts, especially the latter one, have been highly successful, and the numbers of destructive insects have been largely reduced by their means. It is no doubt true, also, that the serious damage to the Hop-crop in New York state was prevented by an emergency bulletin distributed through the Hop-growing region, which instructed growers how to fight the Hop-plant louse in the most successful way. In the Botanical Division extensive exploration and survey have been made, especially in the Death Valley of southeastern California, and among the grasses and *Cactaceæ* of Texas, New Mexico, and Arizona; and general herbarium collections have been received from the Indian territory, northern Wisconsin, Minnesota and Florida. An experimental grass and forage station at Garden City, Kansas, has been continuing operations started three years ago for testing grasses and grains adapted to semi-arid districts; these experiments seem to show that there are forage-plants which can produce, with proper management, even under the arid conditions of western Kansas, crops not greatly inferior to those of more eastern and moister regions. The most important work of the Division of Ornithology has been a biological survey of parts of southern California and Nevada under the charge of Dr. Merriam and Mr. T. S. Palmer. The expedition was organized to determine the boundaries of the natural life zone in these regions, and to study the problems which relate to the lines which cover the distribution of life there. The determination of such a line is a matter of consequence, inasmuch as it fixes the northern limit of raisin-production and the cultivation of sub-tropical fruits.

The Division of Vegetable Pathology has been so often mentioned during the year, and its work in the treatment of Grape-diseases and Peach-yellows and the disease which is called Peach-rosette, that it only needs to be added here that a large number of New York nurserymen and fruit-growers requested that an agent from that division should be sent to Geneva to remain on the ground to investigate some diseases of the nursery stock which have grown to such an extent in that vicinity. It shows the general interest and confidence in the work of the division when it is said that about 3,000,000 fruit-trees in nurseries have been treated for leaf-blight and other diseases near Geneva, and it is largely through the aid of investigators in this department that some of the diseases can now be controlled at comparatively little expense.

In the Division of Pomology a monograph on the Wild Grape has been prepared, and a bulletin on Nuts of America is in press. Besides this there have been investigations of fibre, a study of artesian wells and underflow, the continuance of the not very reputable seed division and some comical efforts to coax a fall of rain by means of ex-

plosions. The Secretary states that he has every reason to believe that "the experiments were eminently successful so far as the production of explosion was concerned"; that is, the agents were successful in making a noise, but so far they have not been able to demonstrate that they can make rain to order. Of the Forestry Division we shall make special mention hereafter when we have the full report. It needs only to be said that this division is more efficiently conducted than it has ever been, and commands greater respect and confidence.

We are not among those who believe that the pursuits of agriculture or horticulture will languish unless they are special subjects of fostering attention on the part of the general government, and we do not sympathize with the desire that the administrative functions of the Department of Agriculture should be greatly enlarged. But it is gratifying to know that in the exercise of its legitimate activities the work of the department appears to increase in efficiency from year to year.

In an article on the Central Park, published in *Munsey's Magazine* for October, Mr. J. C. Hamilton says: "The list of statues to be found in Central Park is a long and rather curiously mixed one. Daniel Webster, Alexander Hamilton, Fitz Greene Halleck, S. F. Morse—these names are well worthy to be commemorated. It is not inappropriate that the marble image of Columbus, the discoverer of the New World, should stand in this the chief pleasure-ground of its metropolis. Nor can there be any objection to the ideal figures—that of Commerce, the cleverly modeled Indian Hunter, and the memorial to the soldiers of the Seventh Regiment who fell in the civil war. But, strangely enough, all the other statues in the park are those of foreigners. The German residents of New York presented the busts of Humboldt and Schiller. Citizens of Italian birth erected the bust of Mazzini, while sons of stern Caledonia contributed the statues of Burns and Scott. From South America came the equestrian bronze of Bolivar, and the list of monuments is completed by those of Shakespeare and Beethoven. Great men as all these worthies were, and laudable as is the desire of their fellow-countrymen to do them honor, it is somewhat unfortunate that the erection of a statue in Central Park should have come to be the recognized method of giving expression to this feeling. If the process is continued indefinitely, the park will become so thickly dotted with the monuments of foreigners that the statues of Webster and Hamilton may have to be removed to make room for the images of the deceased poets and scientists of England and France, Finland and Kamtchatka."

We do not agree with Mr. Hamilton in the feeling he expresses. We do not think it unfortunate that our foreign citizens should so often have desired to set up memorials of the great men of their own lands in the most famous pleasure-ground of the land of their adoption. We think, on the contrary, that such gifts should be welcomed as a tribute to America's hospitality, as a sign that those who seek her shores are grateful for the welcome they have received, and, while still loving the nation to which they belong by blood, have learned to love the nation which has granted them wider opportunities for happy existence. In any American city such witnesses to the strength of the tie that binds the foreign-born citizen to the community of which he now forms a part would be appropriate. But in New York, which is pre-eminently the cosmopolitan city of America, they have a double title to exist. There may be reasons why this cosmopolitan character should displease native-born New Yorkers, but its expression through public statues should not be counted among them. If such statues are as yet more numerous than those given by Americans to commemorate Americans, the fault is our own, not that of our adopted brothers.

Nor will the presence of statues of notable foreigners be without its good effect on the public, for surely it is well that Americans should be interested in the great men of other lands as well as of their own. We hope, of course, that in the future the preponderance of foreigners over Americans in the bronze and marble population of our pleasure-grounds will not be maintained. We do not want the great men of Europe alone, though we are willing enough to have these if they be worthily portrayed. Just here is the vital point in the matter. Patriotic citizens need not desire to limit the hospitality of our parks by lines of nationality so long as the works bestowed are paid for by private contribution. But they should insist upon limiting it by the lines which divide good works of art from bad ones. They should object very strongly to the presence of certain statues in the Central Park, not because they portray Burns and Walter Scott and Bolivar, but because they are unworthy, grotesque and hideous productions, distressing to the eye of taste, hurtful to the eye of interested ignorance, and injurious to the effect of the beautiful scenes amid which they stand. What the Park authorities should say to Americans and foreign-born citizens alike is: "Give us all the monuments you choose and of any persons you choose, if these were persons who in any part of the world did helpful service to humanity and were an honor to the name of man. But be sure these monuments are good in themselves and well adapted to such stations as they must occupy. It is our business to preserve the beauty of the Park, to provide for the pleasure and profit of its frequenters, not to honor this man or that, or to 'conciliate' any class of New Yorkers. It is your business, if you want to honor your compatriot and thus to exalt yourselves, to make sure that we can help you without being unfaithful to our important trust."

The Cranberry Bogs of Cape Cod.

EVERYBODY knows that Cape Cod supplies the world with its best Cranberries, and that the business of growing that fruit has transformed many hitherto worthless marshes in that region into land worth a thousand dollars an acre and upward. The word "bog," however, carries with it to few persons any suggestion of rural beauty, and yet the Cranberry Bogs of Cape Cod, apart from their economic value, make pictures of rare attractiveness at all seasons, and particularly at harvest-time. The ridges of rock and sand which form the cape would naturally be considered unpromising places to search for ponds and lakes, but not only do such ponds abound in the higher ground, but many beautiful trout streams wind down from the hills into the bay or the sea. As these streams have comparatively little fall, in the course of ages the booty which they have gathered from the hills has been deposited on either side of them until in time they are bordered by wide, marshy, bottom-lands, in which shrubs and plants and trees which love water grow in tangled luxuriance. Many of the Cranberry Bogs are made on the marshes which border these streams. It is a slow process to cut off the thick swamp-growth and grub out and burn the stumps and roots. In many places it is necessary to "turf" the whole area, as it is called—that is, to peel off one or two feet of the entire surface soil with the living and dead, but undecayed, material which has accumulated there. Then the land has to be drained, because, although the Cranberry is a half-aquatic plant and needs to be flooded with water at certain seasons, yet it must have dry and solid root-hold during the season of growth and fruitage. This means not only that dams are built across the track of the stream at intervals, but deep ditches are cut across and often around the bog to catch the drainage from the bank, so that a series of levels or sections is made, each with its dam and system of ditches, until the bottom-lands are all made ready.

After all this, the beds must be covered with sand from three to five inches deep—a laborious task where a hundred acres are to be dressed, and one which would entail an expense that could not be borne but for the happy circumstance that the material is close at hand in the banks which border the bottoms. When the smooth sanded surface has been prepared at a cost of from $250 to $1,000 an acre, long cuttings of the plants are doubled up and thrust through it at intervals of fifteen inches each way by means of a wooden paddle; these quickly root in the rich soil below. During the first summer the slender vines, which spread out in rays from each cutting, make a beautiful tracery on the white sand,

which helps to hold the warmth, to serve as a mulch, to alleviate extremes of drought and dampness, to smother weeds, to keep the plants from being lifted out by frost in winter, and to check a rampant growth and consequent unproductiveness of the plants. The next year the whole area is covered with a net-work of trailing plants and leaves, and the third year, and for no one knows how long thereafter, the whole field will be covered thickly with short upright fruit-bearing branches so full of berries in autumn that one can hardly run his fingers under them anywhere without pulling out a handful. Very beautiful in summer is this lawn-like expanse of glossy green, and it is still more beautiful as the green or white or red or dark purple fruit appears among the thick leaves. Standing on the high bank which usually borders one of these bogs, and looking across it, the level foreground, with its winding brook, stretches away for ten or a hundred rods, according to the width of the bottom, while the further boundary is usually another steep bluff, at whose base Viburnums and Wild Roses, Bayberries and Sweet Ferns are rioting, and above them are Dwarf Oaks, with a forest of Pitch Pine and Oak on the summit to form a waving sky-line as a fitting finish to the prospect. From some points, looking downward through the valley, glimpses of the sea are caught; again a gray road is seen winding up the opposite slope and finally lost in the woods, and every detail of the picture is charming.

At the harvest-time a new element of interest is added by the pickers, who camp on the bluffs and have a picnic for a month or so. For the actual work of picking, white cords are stretched across the bog about a yard apart at right angles to the straight line of the ditch, where the gathering begins. Each picker gets down on his or her knees and takes the fruit clean between two of the cords, so that the entire force of harvesters move forward, side by side, like an advancing line of battle; and as they are men, women, and children of all nationalities and various costumes, the bright colors of their head-gear and other apparel form a picturesque addition to the scene. A small harvesting party is portrayed in the picture on page 545. Pickers are usually employed in groups of a hundred or more, and as fast as a measure, which holds six quarts, is filled by one, he turns it in and receives a dime for it. It is not an uncommon thing for a superintendent of a bog to receive from Boston by express several thousand dollars in ten-cent pieces to be distributed among the pickers for a day's work. Expert pickers sometimes make five dollars a day, and when they use machines, with which the fruit is stripped off by handfuls, they earn considerably more.

The Cranberry Bogs of Cape Cod furnish a striking example of what may be accomplished by specialization in economic horticulture. It has taken long years of experiment and practice to determine what the Cranberry-plant needed in order to reach its highest possible productiveness, and now, with intelligent preparation and enrichment of the soil, close attention to every cultural detail, constant watchfulness against weeds and insects, frosts and fungi, a yield of 150 barrels of solid, evenly colored berries to the acre is not surprising. How thickly the fruit must hang on the vines which yield such a crop may be imagined, if it is remembered that this means a barrel of berries on every sixteen feet square.

Entomological.

A New Herbarium Pest.

IN the year 1890 a number of small Geometrid larvæ, recalling somewhat in appearance those of the genus Aplodes, were found by the botanist of the Department of Agriculture infesting certain dried plants in the department herbarium, and especially those which had been received from Mexico and lower California from Dr. Edward Palmer. Dr. J. N. Rose first observed it in January, 1890, on plants from La Paz, but it was still more abundant in a collection from the State of Colonna, Mexico, made in the beginning of the present year. Being referred to me for identification, I became much interested in the matter, as it was the first case that had come under my notice of a Geometrid larva feeding upon dried plants. The matter acquired additional interest also because the species was evidently new and there was danger of its being spread through distribution into other parts of the world. I therefore took steps to watch the course of the insect and rear it to the imago state. This was done some time ago, and I have had drawings of the different stages finished for some time, and call attention to the matter now because the trouble has grown in the department herbarium and it is of sufficient importance to put on record. The first moth emerged October 22, 1890, and others were subsequently reared from material received from time to time from the department herbarium. While the larva was first discovered, as stated, on Mexican plants, it has not confined its work to such plants, but has spread to others and is by far the most destructive herbarium pest which the botanists in charge have to deal with. Plants of the genus Coulterella, for example, which were sent by Dr. Rose to Dr. O. Hoffman in Berlin, have been so injured that but one perfect flower remained; yet, according to the observations of Mr. L. H. Dewey, in overhauling the herbarium, the insect's work is still mostly confined to south-western plants. Next to these from Mexico those from California suffer most. In some cases eastern plants have not been attacked, even when associated with western, but in one case, at least, that of *Rhus Toxicodendron*, eastern plants have been extensively infested.

The larvæ feed on the flowers and also to some extent on the leaves. More rarely they feed on the hard fruits and seeds. The following list, prepared by Mr. Dewey, of the plants upon which the larvæ had been found prior to its work on *R. toxicodendron*, will be of interest in this connection:

SPECIES.	LOCALITY.
Ptelea aptera	Southern California.
Ceanothus sorediatus	Southern California.
Dalea Seemanii	Southern California.
Lupinus coccinius	Arizona.
Purshia tridentata	Arizona.
Prunus demissa	Southern California.
Ribes viburnifolia	Southern California.
**Epilobium angustifolium*	Eastern Massachusetts.
Arctostaphyllos oppositifolium	Southern California.
Eriodictyon glutinosa	Southern California.
Cilia Rusbyi	Arizona.
Pentstemon secundiflorus	Arizona.
Audibertia Clevelandii	Southern California.
Dracocephalum parviflorum	Arizona.
Salvia ballotæflora	Arizona.

The eggs are laid upon the plants or on any surrounding object. They are but slightly attached, bluntly ovoid, 0.3mm. wide and 0.4mm. long. They are steel-gray in color, the shell white with faint iridescence when empty, and faintly and irregularly reticulate. The duration of the larval period has not been determined. Growth, however, is very slow, and the period from the egg to the full larval development is variable. The larval life extends in some cases certainly over a period of three months. When full-grown the larvæ attain a length, extended, of 8mm.; contracted when disturbed or at rest of 5 to 6mm. Whenever disturbed they contract

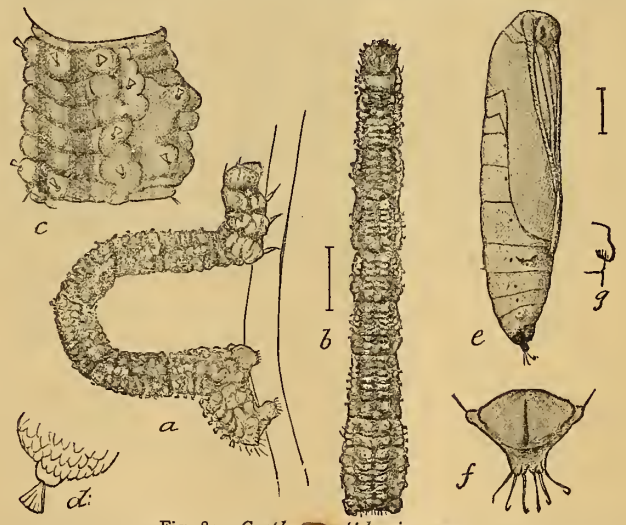

Fig. 84.—*Carphosiara ptelearia*, n. sp.

a, larva, side view; *b*, same, dorsal view—enlarged; *c*, side view of a single segment still more enlarged; *d*, a single tubercle of same—still more enlarged; *e*, pupa; *f*, cremaster of pupa—enlarged.

considerably and become rigid and motionless. The larva is shown in characteristic positions in the accompanying illustration (Fig. 84 *a*). It is dull grayish in color, varying considerably in different specimens. On reaching full growth the larva constructs a cocoon of loose white silk, forming an irregular open net-work, as shown in Fig. 84 *b*. The cocoon is usually placed in a fold of the leaf or is otherwise protected by the plant, and is occasionally partly covered with bits of

* *E. angustifolium* grows in the west, but mostly in northern California and Oregon.

anthers or fragments of leaves. In shape it is irregularly ovoid and is about 6mm. by 3.5mm. The change to pupa takes place about three days after the cocoon is completed, and the moth usually appears eighteen to twenty days after pupation. The pupa is 5mm. in length, somewhat robust, and is slightly yellowish in color, with sutures and tip brownish, the latter being quite dark. A peculiar pad or flap-like projection occurs on the side of the fifth abdominal joint (*e* and *g*). The cremaster is produced, notched at the tip and armed with six long, hooked hairs or spines (Fig. 84 *f*). The adult insect is about 5mm. long, and expands from 13 to 14mm. The general color is grayish yellow, inclining to saffron, the primaries being somewhat darker. The wings are marked (Fig. 85) with transverse bands of dusky shade, and each wing has a discal spot. The head is dark brown, with the antennæ, including a large spot on the vertex, yellowish. The under surface is nearly concolorous, the dark bands being less distinct, and the discal spot more intensified. The fringes are concolorous with the ground color and with black dots beyond the veins.

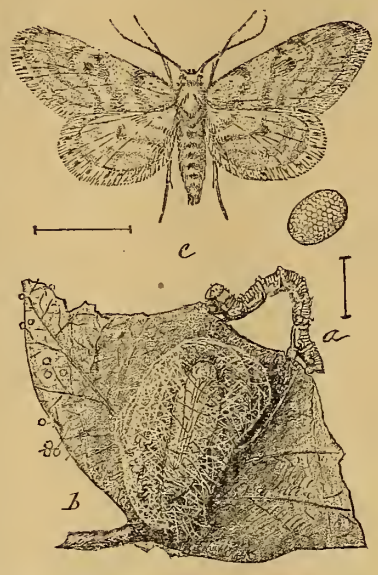

Fig. 85.—*Carphoxera ptelearia*, n. sp. *a*, larva in natural position; *b*, cocoon on dry leaf; *c*, moth, with egg at its lower right-hand corner. All enlarged.

This insect has become a source of positive alarm in the department herbarium on account of its rapid multiplication and the harm it occasions. It behooves botanists to be on the lookout for it and to adopt such measures as will ensure immunity from it, if dry specimens are being received from Mexico and the southwest, or from herbaria in which it is known to occur. The custom of poisoning dried plants with corrosive sublimate to protect them from various enemies, such as book-mites, Psoci, etc., should give immunity from the attacks of this insect if the poison has been thoroughly applied. If to the corrosive sublimate a quantity of arsenic is added the protection will be more effectual. I would also recommend, as very useful in disinfecting herbaria of this and other pests, an air-tight quarantine box of zinc or galvanized iron in which the plants may be temporarily placed and submitted to the fumes of bisulphide of carbon, which are very sure to destroy all insect life. Effective steps have already been taken to prevent the sending out from the department of any infested specimens in future.

The fact that this insect has appeared in dry plants from the comparatively arid western regions may furnish a clue to its original habit. It is presumable that it normally feeds on the dead or dried plants of Mexico and adjacent arid regions, and that it has simply adapted itself to the somewhat similar conditions prevailing in herbaria.

This is the first true Geometrid, so far as I know, recorded as feeding on dry and dead vegetation. In the Pyralidina a number of species are known to be not only truly carnivorous, feeding on other insects, but also to feed upon grass and rejectamenta as well as dead leaves. Some Tineina are also known to have similar habits, while in the Deltoid group of the Noctuids several genera are known to feed on dead leaves.

The illustrations, which have been prepared for *Insect Life*, are used by permission of the Honorable Edwin Willits, Assistant Secretary of Agriculture.

Washington, D. C. *C. V. Riley.*

New or Little-known Plants.

New Orchids.

Catasetum Naso, Lindl.—The female flower of this singular species has now appeared in the Kew collection on a plant which has produced males only in former years. It is about the size of those of the other sex, the color light green, with a narrow purple margin to the lip.—*Gardeners' Chronicle*, August 29th, p. 242.

Lælia-Cattleya × Nysa, Hort.—A hybrid raised in the collection of Messrs. James Veitch & Sons, of Chelsea, between *Cattleya gigas* and *Lælia crispa*. The flower is pale lilac, with the front of the lip deep crimson. It was exhibited at a meeting of the Royal Horticultural Society on August 25th last.—*Gardeners' Chronicle*, August 29th, p. 254.

Neobenthamia gracilis, Rolfe.—A very interesting new genus of Orchids, allied to Bromheadia, which flowered at Kew in February, 1890. The plant is a native of tropical Africa, and was sent from Zanzibar, by Sir John Kirk, in 1884. It is of a peculiar straggling habit, as if it grew among bushes and availed itself of their support. The leaves are distichous, drooping, and about six inches long, and the short racemes are borne at the ends of the branches. The flowers are white, the lip with a yellow midline, and a row of rosy purple spots on either side.—*Gardeners' Chronicle*, September 5th, pp. 272, 273, fig. 33.

Cypripedium × Macfalanei, Kränzlin.—A hybrid raised in the collection of Messrs. F. Sander & Co., of St. Albans, from *C.* × *calophyllum* (itself a hybrid from *C. barbatum* and *C. venustum*), fertilized with the pollen of *C. Spicerianum*. It bears much resemblance to the pollen parent, with some characters derived from the mother plant in the petals and leaf.—*Gardeners' Chronicle*, September 12th, p. 300.

Kew. *R. A. Rolfe.*

Plant Notes.

Some Recent Portraits.

In the *Gardeners' Chronicle* for October 3d the cones and flowers of the noble Himalayan Fir (*Abies Webbiana*) are figured. This tree, which is remarkable for the silvery whiteness of the lower surface of the leaves and for its great dark purple cones, succeeds fairly well in some of the southern counties of England. It seems perfectly at home in many gardens on the shores of the Italian lakes, and there are several flourishing specimens in California. Unfortunately, it will not thrive in the eastern states, although possibly in some parts of Georgia and Carolina it will be able to support our eastern climate.

The October 1st issue of the *Revue Horticole* contains a colored plate of a fruiting branch of *Ficus stipulata*. This is the plant which is found in almost every greenhouse under the name of *F. repens*, where it generally only reaches its juvenile state when it is a vine with small leaves, climbing by rootlets developed from the slender stems. At the end of several years, when it becomes adult, it changes its character entirely and develops robust erect branches, producing large, oval, oblong, obtuse, petioled leaves and violet-colored figs the size of the ordinary edible fig. The fruit is produced sparingly, although it seems that in the south of France, in the open air, it is not an unusual occurrence to find the plant in its adult state, and more or less covered with fruit.

F. stipulata has been known in gardens for more than a hundred years. It is a native of Japan and southern China, extending at least as far south as Hong Kong, and it is probable, therefore, that it will succeed in some parts of the southern states, and certainly in southern California. It is needless to say that in its young state it is one of the very best of all evergreen climbers to cover the back walls and other waste places in greenhouses which it is desirable to clothe with vegetation. The fruit is not edible.

Foreign Correspondence.

London Letter.

Cattleya Warocqueana.—Last year I stated in a letter to Garden and Forest that this Cattleya, which had been introduced by M. Linden, and described by Mr. Rolfe, was a form of *C. Gaskelliana*. This statement produced a protest from M. Lucien Linden, who declared that in the opinion of competent judges there was no difference between his *C. Warocqueana* and the autumn-flowering *C. labiata*. At that time I shared the view of many authorities here with regard to this Cattleya, namely, that while it was

of quite exceptional value as a garden plant, it could not be considered identical with *C. labiata vera*. I was wrong. M. Linden has sent to London this week no less than two hundred plants in flower of his *C. Warocqueana*, to be sold by auction after being exhibited in the rooms of Messrs. Protheroe & Morris, Cheapside. Among them there were many which might have been mistaken for the form of *C. labiata*, previously represented in English collections by less than a dozen plants, all supposed to be from the original plant described by Lindley. There were also among M. Linden's plants some which, while possessing all the characteristics of that species, were even superior to it in size of bloom and depth of color. The plants sold well, realizing from twenty guineas to one guinea each. M. Linden deserves all the credit of being the first to discover the whereabouts and to introduce living plants of Lindley's *C. labiata vera*. It follows from there being so many plants of this Cattleya recently imported, first by M. Linden and again lately by Mr. Sander, that there are now thousands of it in cultivation, and consequently the plants which two years ago were worth fifty guineas are now worth perhaps ten shillings. The Cattleya is, however, a most valuable plant for gardens, as it flowers at a time when flowers of any kind are not too abundant, namely, October and November. One cannot, therefore, very well have too many plants of it.

Cochleoda Noezliana.—Several plants in flower and a large number of newly imported pieces of this new and pretty Orchid were included in the sale at Messrs. Protheroe & Morris' rooms. The flowers are borne on arching spikes, similar in size and form to those of *C.* (*mesospinidium*) *vulcanicum*, but of thicker texture and colored orange, almost the same shade as the flowers of *Ada aurantiaca*. I am told that this little Orchid is very easily grown in a cool, moist house, and that it will flower regularly and profusely.

Cattleya Bowringiana.—This is proving itself a first-rate plant, probably the best of the section to which it belongs. It is freer in the production of flowers and more variable in color than its near ally, *C. Skinneri*. I saw this week in the nursery of Messrs. F. Sander & Co., St. Albans, a large number of plants of this Cattleya in flower. Some of the spikes bore sixteen flowers, and I was told of one plant which had borne three spikes, two bearing seventeen flowers and one with eighteen. The color of some of the flowers is deep rosy mauve, others are lilac, others rosy crimson. This variation in color extends to the labellum, some having a large maroon blotch, others a paler one, others a whitish margin, and others no blotch at all, but wholly white inside the tube. The season of flowering may be made to extend over several months in autumn and early winter. Moreover, the plants grow well in an ordinary greenhouse temperature.

Dendrobium Phalænopsis.—A considerable number of the newly imported plants of this Dendrobe are now flowering at St. Albans. So far every one has proved to be a form of the plant represented in the *Botanical Magazine*, and many of them have large and richly colored flowers.

Fig. 86.—A Cranberry-field on Cape Cod, Massachusetts.—See page 542.

Miltonia vexillaria, var. Sanderiana.—This is a new and well-marked variety which is now in flower at St. Albans. It is by far the handsomest of the many forms of this Miltonia, the flowers being three inches across, of good substance, and colored bright rosy mauve, with a large triangular fretted blotch of rich maroon on the labellum. This blotch is the distinguishing feature of the flower, as it is an inch broad at the base of the labellum and is narrowed to a point at the sinus. Mr. Sander obtained this variety from a native collector in Colombia, to whom he paid fifty guineas for it. Should it prove to be an autumn-flowering one under cultivation its value will be considerably enhanced.

Darwin Tulips.—This is a new and beautiful race of Tulips which has lately been brought into prominent notice by Messrs. Krelage, of Holland. As Darwin Tulips are almost certain to become favorite garden-plants, their

colors being so exquisite and varied, and their forms elegant, a few words with regard to their origin may be interesting to bulb-growers in America. I have seen these Tulips in Messrs. Krelages' nurseries, and have heard from the venerable chief of the firm himself the history of what he considers to be the most beautiful of all races of Tulips. The name of the race has been given by Messrs. Krelage to commemorate the work of Charles Darwin in the elucidation of the subject of variation and cross-breeding in the vegetable kingdom.

It appears that about thirty years ago a Dutch bulb-grower set to work to produce from a selection of the best breeders of Tulips a fixed race which should differ from those then known. The plants he had to operate upon had been in the possession of his family over a century. About six years ago the Messrs. Krelage purchased the whole of this ancient collection and transferred it to their nursery at Haarlem, where the process of selection and propagation of the best varieties was pushed on in earnest. The result is now a magnificent collection of bulbs ready for distribution by the Haarlem firm. There are hundreds of kinds, besides many which have not been named. The cheapest mixed bulbs will be sold at about thirty shillings per hundred, while the choicest named sorts are priced at from five to forty shillings each. At Kew there was a small collection of Darwin Tulips in one of the flower-beds last spring. They flowered well, showed great variety in color, and were much admired. They appear to be strong in constitution and to grow vigorously in ordinary garden-soil.

Autumn Leaves.—An exhibition of the most conspicuous among those deciduous trees and shrubs whose leaves assume bright colors before falling in autumn was a special feature of the last meeting of the Royal Horticultural Society. The plants exhibited, as well as the excellent lecture delivered by Mr. H. Veitch, only emphasized what I said in a letter about this time last year, namely, that beautiful leaf-pictures might be produced by means of autumn tints which would equal in effect the best of pictures produced by flowers. The weather in autumn has considerable influence upon the coloration of leaves, and owing to the absence of frost and prevalence of heavy rains this autumn the leaves are not as bright as usual. Still there are plenty of beautiful leaf-pictures in the garden now. Oaks, Rhus, Vitis, Cratægus, Ribes, Liquidambar Nyssa, Acers and many others are aflame with color. Mr. Veitch drew attention to the beauty of all these, and also pointed out that garden-makers, as a rule, failed almost entirely to take these plants into account. The best of the autumn-colored trees and shrubs in cultivation in England are either of Japanese or North American origin. The rich colors of the leaves of these plants as exhibited invested them with a new interest for those who had previously paid no attention to the subject of autumn-colored foliage available for outdoor effects.

New Chrysanthemums.—The following have received certificates, this week from the Royal Horticultural Society: M. R. Bahaunt—a large incurved variety, broad in petal, full, and of a rich red-brown color; Louis Boehmer—already well known in America. So far as English experience with it goes, this variety is much superior to its older rival, Mrs. A. Hardy, which has proved one of the very worst growers in England; R. Smith—a bright-colored sport from Dr. Sharp, distinct in its larger flowers and bright brown-crimson shade; Mrs. Nisbet—a dwarf reflexed variety scarcely three feet high, with rich claret-crimson flowers, broad petaled and suggesting the flowers of Madame C. Audiguier; William Wells—a bright primrose-colored sport from Madame B. Pigmy.

Aristolochia gigas.—This is the correct name for the plant figured last year in Garden and Forest as *A. grandiflora* and noted this year in almost all the English garden periodicals under the same name. The Kew plant was obtained from Mr. Sturtevant, of Bordentown, New Jersey, last year, and it has been a great attraction here since the beginning of August, having produced altogether about fifty flowers, and there are more to come. The largest measured eighteen inches by twenty-two inches, with a tail three feet long. It appears that Lindley figured and described *A. gigas* in the *Botanical Register* in 1842 from a plant introduced from Guatemala to Chiswick, where it flowered in 1841. In 1848 a second figure of it was published in the *Botanical Magazine* (t. 4368-9) under the name of *A. grandiflora*, made from a plant supposed to have come from Jamaica. Herein lay the mistake. So far as can be made out at Kew now Lindley's *A. gigas* has not been found wild in Jamaica or anywhere in the West Indies, and if Purdie found the plant figured in the *Botanical Magazine* in Jamaica it must have been either cultivated or introduced. The species common in Jamaica and the West Indies is *A. grandiflora* true. This is very similar to if not the same as *A. fœtens*, and has comparatively small flowers, certainly less than a quarter the size of Mr. Sturtevant's plant; it also differs in the length and form of the tube, as well as in other structural characters. *A. gigas*, then, must stand for the Guatemalan plant. But this form of it, for which we are indebted to Mr. Sturtevant, is so very much larger than that figured in the places above referred to, that, for horticultural purposes at any rate, it ought to have a distinctive name. We propose, therefore, to call it *A. gigas*, var. *Sturtevanti*.

Kew. *W. Watson.*

Cultural Department.

About Apples.

A NATURAL fault in most men of limited experience is to dogmatize by assuming that their experience covers the whole ground. But in any art having to do with plant-growth and culture the variation of a few degrees of latitude, or even of longitude, on the American continent at least, will expose facts as hard and unyielding as rocks, and over which a cart-load of theory can easily be upset. I have been a fruit-grower and observer in the south and west, and in the north and east, long enough to learn that an even moderate change of conditions will modify fundamentally the whole situation and demand, often, a complete reversal of practice.

As an illustration of this truth it may be stated that while there is no better locality on this continent for the propagation of the Apple-tree than north-western New York, and while there are no more experienced nurserymen than those of that region in matters of which they have full cognizance, yet there is nothing which excites more bitter scorn among practical orchardists in northern New England and the Canadian provinces than the mention of New York trees. On the other hand, I have never yet met more than one New York nurseryman who did not stand ready to overwhelm the very mention of the iron-clad varieties with impatient ridicule. I have myself, at least temporarily, lost credit at pomological meetings in northern New England by saying that I am as willing to plant New York trees as any, if they are of the right variety. But when I went on to ask exclaiming doubters whether they thought a New York grown Oldenburgh would not stand the winters of northern New England, they were compelled to reflect a little. Some would say that New York trees are grown too fast by high manuring, and the wood is tender and pithy; but when it came to close questions they "did not know but Russians and Crabs grown in New York might do well enough."

Now, in my own experience I have never found that strong-growing trees, well cultivated and attended to on well-enriched land, were any more likely to fail, when properly set out and cultivated, than the gnarled and scrubby trees of local origin. With me, strong, vigorous trees (of the right kinds) reaching the height of four or five feet at three years, and then set out in rich soil and well cared for, have continued to grow on and, contrary to much prophesying, come soon and profusely to bearing, and remain healthy after many years. My orchards have been visited by many experts who can testify to these facts.

There is, at present, a controversy on the subject of grafting the Apple upon what are called "piece-roots"; and a western nursery which claims to make a specialty of whole-root grafts sends me a circular in which very eminent pomologists—in fact I may say the most eminent, since President Berckmans and Vice-President Lyon of our Continental Pomological Society are among them—give unqualified assent to the practice.

So do I, with some qualifications which experience demands. There are certainly no objections to whole-root grafts—if you can get them. So far as I know they are not really made; for although a seedling may be used for each graft it is always more or less trimmed. The question is also complicated as regards the iron-clad varieties, by the fact that these root-grafts must be deeply planted to protect them from winter-killing; and it is widely believed, especially in the north-central states and Canada, that it is better to use a short root and a long cion—the grafts in nursery and the trees in orchard being deeply planted in order to get roots from the cion. That this can be done with the Apple, as it is done with the Pear on Quince roots, is unquestionable; and I should ask those gentlemen who prescribe piece-roots whether they have not seen many vigorous old standard Pear-trees which were originally dwarfs on Quince, but are now on roots of their own. I can point to a whole orchard of such trees, some forty years old, in the city of Gardiner, Maine.

President Berckmans will find no man of experience taking issue with his statement that in nurseries and orchards crown-grafts will, as a rule, take the lead in growth, other things being equal. The more root there is to a root-graft at first (if the work is well done) the more vigorous will be its growth in nursery; and if the tree is properly transplanted this lead in the nursery will be maintained in the orchard. I have grown nearly all the trees in my orchards from the root-graft, and such has been my experience. But it is also my experience that grafts with smaller roots make quite as thrifty trees, and the difference seen in the nursery does not increase in the orchard. I have always, when root-grafting, taken pains to choose stock and cion of equal size, so that there should be a chance for union all around; and I would like to suggest that a poor growth upon a medium or small root is as likely (and indeed much more likely) to be due to a bad fit between root and cion than to the mere size of the root. It should be understood that all the stocks should be carefully assorted at digging and all weaklings rejected. Difference in the size of healthy roots, within limits, is due chiefly to a more or less good chance in the seed-bed. Even with careful thinning this will be true. If all these points have due and careful attention a moderate difference in the size of roots makes no practical difference in the size and productiveness of the orchard tree.

I think there is one fallacy which has fixed itself in the minds of some very intelligent men. It is that there is something specially vital in the point of junction between root and stem. Some seem to think it as vital as the heart in an animal, or something analogous to it, but I have no experience to confirm that idea, and a great deal against it. A tree may be planted with this point of union considerably above or below the surface without injury. If a root-graft is made with a cion a foot long, and set out so that only a few inches is above ground, this neck will be formed at the surface and the young tree have a perfectly normal appearance afterward. As a reverse experience I may mention that several years ago I noticed that a number of Apple-seedlings which had been left in the ground over winter had been thrown out so that about three inches of the root was above the surface. As an experiment I merely trod the earth firmly to the plants as they stood. They grew and formed perfect new necks at the surface, while the portion of root above ground assumed the color and look of the wood above. The same thing happened at the same time to a young Russian Pear-tree, which was also left untouched. It made a growth last season of over four feet on the main shoot, and the new point of junction has the normal appearance. I may add that in experimenting with a collection of root-grafted Siberian Crab-hybrids some fifteen years ago I found one variety that absolutely refused to unite with the root on which it was spliced; but several of these sent out roots from the bottom of the cion and made a vigorous growth of top, forming perfect and well-balanced trees, which I have often shown to visitors as specimens of Apple-trees grown from cuttings.

Newport, Vt. *T. H. Hoskins.*

The Propagation of Ferns.

WHEN Ferns are propagated by means of spores, which is the usual way, the first matter to be attended to is the collection of the spores, and this requires the exercise of some judgment, for if the fronds are cut before the spores begin to ripen they will be of little value. The usual practice is to collect the fronds as soon as a majority of the fruit-dots appear to be opening. The fronds should then be wrapped up in a clean paper and put away in a warm, dry place for a week or two, after which it will be found that many of the spores have been shed from the sporangia into the paper. In order to secure the remaining spores, the fronds may be rubbed between the hands and then passed through a very fine sieve (a No. 40 mesh answers the purpose very well), to free the spores from the fragments of the leaf. If not sown immediately, the best method of storing the spores is to put them in small vials, such as are used for homœopathic medicines, and in which they may be tightly corked and put away in a dry place for future use.

Where Ferns are raised in large quantities for trade purposes the sowing of the spores is usually done during the fall and early winter, so that the seedlings may be ready for potting off in the spring or summer, the majority of such Ferns being sold in small pots within a year or eighteen months from the time the seed was sown. This raising of crops of seedlings at certain seasons is not, however, so necessary in private establishments, and consequently the spores may be sown at the convenience of the cultivator, though it should be borne in mind that in most cases fresh spores are preferable to those that have been stored for a long time.

The compost best suited for Fern spores in general is an open mixture consisting of equal portions of peat and loam, with enough sand to keep it porous, the various ingredients being passed through a fine sieve. Either pots or pans may be used to contain the soil, but in either case abundant drainage material should be provided, and about five or six-inch pots, or pans six inches square, are convenient sizes. The pots should be filled firmly with the soil and thoroughly watered, after which the spores should be thinly scattered on the damp surface of the soil and should not be covered. The seed-pots should then be placed in a propagating frame or covered with panes of glass, to prevent the soil from drying out rapidly, but in either case should be ventilated each morning, so as to avoid too great an accumulation of moisture on the glass.

The time required for germination varies with different Ferns. Some species of Pteris are among the quickest to germinate, and the young plants often appear in a week or ten days. As soon as this growth becomes visible more air should be given to the seed-pots or the minuter plants may be attacked by fungus, and the prothalli are so tender and so close together that it is exceedingly hard to arrest any such disease. It is under such conditions as these that the wisdom of sowing in small vessels is seen, from the fact that when the prothalli begin to "damp off," the entire contents of the seed-pot is often lost. Probably the best method of checking such disease is to give plenty of air to the seedlings and to keep the affected pots rather dry. I have tried sulphur, lime-water, sulphate of lime, dry sand, and some other remedies that have been suggested for this fungus from time to time, but with little success, and the cultural care above recommended has proved the most satisfactory remedy.

As soon as the seedlings are ready to throw up their first leaf they may be pricked out into other pots or pans, transferring them from one pot to the other in small patches or clumps, and as soon as these are large enough to handle they may be divided again into single plants and thus potted into two-inch pots. After potting, the seedlings should be kept moist and well shaded until they have begun to root afresh, and after this the culture of most species is easy. As new varieties are frequently found among Fern-seedlings additional interest is thus given to what is at all times a most fascinating branch of the gardener's art.

Holmesburg, Pa. *W. H. Taplin.*

Thorpe's Pedigree Seedling Chrysanthemums.

IT has often been doubted, even by competent cultivators, whether it be possible to hybridize the Chrysanthemum with any certainty. Not only are the composite flowers with difficulty preserved from the visits of the fly prevalent during their season of bloom, but they are also likely to be self-fertilized. Those who have watched carefully the productions of a few of our most noted growers can have had little doubt that they at least were working on lines of some certainty. It is unnecessary to say to the readers of Garden and Forest that John Thorpe is one of our most ingenious and accomplished hybridizers, and those who have had some hint as to his operations on the Chrysanthemum were not surprised to see his offering early in the year of a set of plants with parentage given. This was a notable event, it being the first time that any grower has offered plants with male and female pedigrees. At the most we have been given one parent, probably often determined by the shape of the seedling.

Mr. Thorpe's seedlings of the year were produced in an endeavor to supply early-blooming plants with the good qualities as to foliage of Gloriosum, Nichols (October Beauty), together with some range of color, and, if possible, of more pre-

cocious habit, for which purpose Madame Desgranges was used in some cases. The fine strong plants with which Mr. Thorpe favored me early in the year were planted out on the north side of my Chrysanthemum plot, where they had plentiful supply of light, without being too severely exposed to the sun, which is usually so trying to varieties of this section. This location was given, however, for convenience, not from any doubt as to their hardiness, and was somewhat detrimental to their early flowering, and the varieties this season were all behind the dates given by Mr. Thorpe. The plants were grown on with ordinary care given to the other plants, but were allowed to carry all the wood made by their various breaks. Mr. William Piercy, of London, who has been the chief propagandist of the early-blooming Chrysanthemum, says that an early variety to be of value must be a free bloomer and capable of throwing flowers of character and well formed without disbudding.

I have grown Mr. Thorpe's plants on this plan with very satisfactory results in most cases. The indications of the plants, except in one case, noted later, all point without doubt to the parentage as given. Salvator (Gloriosum × Roi des Precoces) is a dwarf stocky grower, very free blooming, the entire head of the plant being covered with good reflexed flowers of a red-bronze shade—a fine variety. Bolero (Nichols × Gloriosum) is a rather tall, free-growing variety, with good foliage but rather weak stems. It was covered with a mass of pleasing chrome-yellow flowers. Eurus (Gloriosum × Roi des Precoces) seems intermediate in habit between the two former varieties, and has bronze flowers of a lighter shade than Salvator. In Sallie McClelland (Nichols × Desgranges) I fail to see any indications of Desgranges blood. It seems a counterpart of Lady Selborne, and possibly my plant may be a rogue. Firenzi, Russell and Stratmeath are Desgranges seedlings, and may be of some value where Madame Desgranges does well, as it does not in my garden. The crosses of this variety do not seem to me to have produced results which will be generally useful in gardens, though in some latitudes they may prove valuable, but probably only where the parent does well. Garden and Forest has already noted the abundance of seedlings to be seen at Mr. Thorpe's place, and it is to be regretted that his labors as Chief of the Bureau of Horticulture will interrupt the introduction of other promising varieties for a time. However, we are likely to hear much of the early Chrysanthemum another season, when S. Delaux's new varieties are disseminated, with a promise of Chrysanthemums all summer, which would seem to be tiresome.

Elizabeth, N. J. *J. N. Gerard.*

Cleome pungens.—Several inquiries regarding this plant have reached me during the past season. It is a soft-wooded perennial, whose branching stems, beset with numerous spines, are from three to four feet high, and thickly furnished with large dark green digitate leaves, arranged alternately and covered with glutinous hairs. The flowers are borne in compact terminal racemes of twenty or more. The corolla, consisting of four spathulate or obovate petals, measures two inches in diameter, and is either white or rose-colored. An elegant appearance is given to the inflorescence by the dark purplish color and divaricate arrangement of the long slender pistils and stamens. The white-flowered form of *C. pungens*, under the name of *C. spinosa*, was cultivated as long ago as Miller's time, having been introduced into England from the West Indies about 1731. The other variety is a native of the same region, but it was not known in gardens until 1812. Both plants were to be met with occasionally in the greenhouses of British gardens about ten years since. A few years later they disappeared almost totally, except in the case of botanical institutions. Now the red-flowered form seems to be commonly cultivated in this country, some one having been sufficiently thoughtful or speculative to distribute a quantity of its seeds a year or two ago. It is well liked, judging from the comments of several, and is likely to attain some degree of popularity. In this climate, however, it should be treated as an annual. It blooms profusely from seed the first year, and the flowering season extends from July till the latter part of September. Mr. W. Miller, of Groton, Massachusetts, has had much success with this plant, and he says the seeds were sown on the greenhouse-bench on the 1st of June, the day they were received; the seedlings transferred to shallow boxes June 18th, and planted in the open ground July 25th, coming into flower August 18th. That was a good performance, but a longer season of bloom would have been secured by sowing in April or May, and getting the plants into the ground early in June. The seeds ripen freely, and both varieties succeed with equal satisfaction under the same treatment.

Sedum Sieboldii.—This is a pretty little plant and one that is, fortunately, common in gardens. It is generally grown in pots or baskets and used in the adornment of greenhouses. The decumbent habit of the stems renders it exceedingly effective in small pots placed along the edges of the stages, and that also makes it so valuable in suspended baskets. It is an excellent plant for the house, thriving well in the dry atmosphere of inhabited rooms. But, admirable as it is under these conditions, the chief merit of the plant is found in the hardiness of constitution which fits it for the herbaceous garden. The opinion that it requires the protection of a greenhouse in winter seems to prevail, even in the comparatively mild climate of England. That this is erroneous has been amply demonstrated in our rock garden, where a specimen has safely weathered the severest storms of several seasons. The slender, simple stems are from nine to twelve inches in length, and they are bent flat to the earth by the weight of the flowers and succulent foliage. The glaucous leaves, tipped with reddish purple, are round, tapering to a wedge-shaped base, and arranged in close whorls of three. The flowers, borne in dense, terminal, broad, compressed clusters, are of a bright rosy purple color, and remain perfect on the plant at least six weeks. Add to this the fact that the flowering season extends from early October until late in November, and we have an unusual collection of good qualities. In this locality we have already had several nights of frost which may be safely called severe for the time of year, but the flowers of this Sedum still hold their own and are as bright and perfect as ever they were. The plant is a native of Japan, whence it was introduced in 1838. There is a variety (*S. Sieboldii variegata*) distinguishable from the type by a large creamy white blotch in the centre of each leaf. Both plants do well in slightly raised sites of the rockery. They look best when planted so that their branches may spread downward over the sides of neighboring stones, and are easily propagated by division.

Tritonia crocosmiflora.—That celebrated hybridizer of plants, Monsieur Lemoine, of Nancy, France, obtained a cross between *Crocosmia* (*Tritonia*) *aurea* and *Tritonia* (*Montbretia*) *Pottsii* some years ago. The genera Crocosmia, Tritonia and Montbretia are close allies, and were then considered quite distinct, but Montbretia has since been incorporated with Tritonia. The names are yet exchanged indiscriminately among gardeners. The hybrid was called *Montbretia crocosmiflora*, and is still widely known under that name. M. Lemoine has been successful in obtaining numerous other forms of Tritonia, which, judging from the comments of European observers, are likely to occupy a prominent place among hardy plants. *T. crocosmiflora* is, so far as I am aware, the only hybrid yet planted in this country, and with rare exceptions its use is confined to those who can supply greenhouse cultivation. Its usefulness as a subject for pot culture is beyond dispute, but as the plant is hardy, under certain conditions it would prove useful to many who do not possess a greenhouse. The doubt which has existed regarding its hardiness may have deterred many who admire it from acquiring a stock for outdoor planting, but there is no reason why it should not be extensively cultivated in every garden from Boston to San Francisco. I am not prepared to say that it will prove entirely hardy when planted in flat beds of rich soil, as seems to be the practice in some parts of Europe. The large bulbs produced under such conditions migh prove to be too tender for this climate. But in a somewhat dry position, with soil of medium quality, the results are eminently satisfactory. That, at least, has been the experience here, and surely there are many other gardens throughout the country in which it may be repeated. *T. crocosmiflora* is about intermediate in character between the two parents. The narrow, sword-shaped leaves, sheathing at the base, are from twelve to eighteen inches long, and of pale-green color. The stem is from two to three feet high, developing at the top a branched spike of orange-scarlet, tubular flowers about an inch in diameter. It is a free-flowering plant, maintaining a perfect succession of bloom from August till October. The bulbous roots should be planted about two inches apart in patches of not less than a dozen in order to secure a good effect.

Cambridge, Mass. *M. Barker.*

Cattleya Walkeriana is one of the most beautiful of dwarf-growing Brazilian Cattleyas, and one which deserves to be more extensively grown. In the collection of Hicks Arnold, Esq., in 84th Street, New York, there is a specimen in excellent health, which flowers annually in great profusion, and is now a very pleasing picture, with its large warm, rosy purple blossoms. It appears to be a great lover of sun and is treated to an abundance of air while in active growth, and thrives best

in a basket or pan suspended near the glass. A remarkable characteristic of this Cattleya is that its blossoms do not present themselves from the apex of the pseudo-bulb, but after each new bulb is completed, a growth appears from its base, which afterward sends forth the flower-spike; when the blooms are past, this develops into a new bulb. Good fibrous peat and very little sphagnum is the best compost, with ample drainage.

New York. *A. Dimmock.*

Damping Off.—The conviction is growing in my mind that the trouble that propagators style "damping off" is a generic one, with a long list of species. If seedlings fall away on account of a decay which appears at or near the surface of the soil it is a clear case of this malady. The portion of a young stem that is most exposed to fungous attacks is that near the soil. Not only does the soil furnish the required moisture for the most rapid development of the fungus, but it also provides the fungus itself in nine cases out of ten. This seems to be true of seedlings, and therefore the precaution should be to have the soil as free as possible of the germs or filaments of the destructive fungus. And, furthermore, any remedy that may be suggested should contemplate a more healthful soil instead of looking toward the cure of a plant that is already ailing. For damping off, therefore, the remedy is not for the plant, but the medium in which the plant is attempting to grow, and from which it receives both its sustenance and the enemy that seeks its life. There are possibilities that the seed itself may be affected, and in such cases the trouble is to be met, if at all, before planting by soaking the seed in some fungicide. This I have tested at length during the past season with Beans, and have determined that the disease, which appears quickly upon the seedlings, was already in the seed before the beans were placed in the soil. It was also shown that by soaking such affected seeds in a solution of carbonate of copper the amount of the seedling trouble could be greatly reduced. While this is not known under the name of damping off, it does not differ from some of the forms of fungous disease called by that general name.

Again, the destructive agency we are considering may prevail among cuttings, and perhaps the amount due to outward conditions about balances the damping off due to a fungus already in the wood when it was placed in the sand. If healthy cuttings damp off, then it is assumed that the soil is greatly at fault; but if the wood is unhealthy, it does not matter much what the soil may be so long as it furnishes water and keeps the lower portion of the cutting wet, the latter will decay at the surface of the soil. I have in mind a bed of Abutilon cuttings which failed almost entirely because there was a fatal fungus in the stock used. It showed itself slightly in the foliage of the large plants, and only when the cuttings were placed in the moist earth did the fungus obtain the best conditions for growth, and damping off followed as a natural sequence. There is little or no hope of a preventive in such cases, unless the soil-water be impregnated with an effective fungicide, which again only shows that, even with unhealthy cuttings, the soil is the medium for treatment.

Rutgers College. *Byron D. Halsted.*

Correspondence.

In the Shore Towns of Massachusetts.—II.

To the Editor of Garden and Forest:

Sir,—The town of Rockport has no public holding of any kind available as a place of public resort, no park or common or right on the shore, except, perhaps, a landing or two. There are two or three beautiful headlands here, very convenient for picnics and out-of-door assemblies. They should be secured for public uses, as this region is certain always to have throngs of visitors. Unless steps to this end are taken very soon these specially attractive sites are likely to be taken up for dwellings by people of means. Pool's Hill, near the village of Rockport, affords a very extensive view of the ocean, of the shore regions, and of some points far inland. It is 230 feet high. The clerk of the town, Mr. Calvin W. Pool, has for several years found his chief recreation in the effort to distinguish and identify the various features of the landscape visible from this eminence. Several years ago he discovered that Mount Washington can be seen from here, and I saw letters from the officers of the United States Coast Survey and other eminent scientific men confirming Mr. Pool's triangulations and conclusions. The hill ought to be public property.

Rafe's Chasm is a wild, rocky cañon on the shore, a little below Norman's Woe, at the entrance of Gloucester Harbor. It is an interesting place, and attracts many visitors and picnic parties. It is dangerous in the present undefended condition of the ledges. There should be railings along the steepest places. One fatal accident, which occurred many years ago, is commemorated by an iron cross fixed in the rock, and if the chasm remains unguarded there will probably be other monuments erected here in time, as the number of visitors increases. There should be a small public reservation here. The view of the sea and of a wide expanse of the shore country is very attractive, and the public should have a right to come and enjoy it; but the adjoining land is likely soon to be put to use as the site of a fine house, and the chasm will then be included in the owner's private grounds.

Not far from Rafe's Chasm there is a Pine grove, which is very pleasant and convenient for picnics, and has long been used as a place of public resort by the people of the region. Some years ago it was purchased by a public-spirited woman, who is interested in the objects for which the Trustees of Public Reservations were incorporated. She is especially desirous that the people of the adjacent country shall have access to pleasant and interesting places by the sea, and wished to preserve this tract and the Pine grove for that purpose. She gladly gives the use of it to all comers, asking only that the trees shall not be injured, and that fires shall not be left burning to endanger contiguous property. She has had some rather discouraging experiences. The picnic people mutilate the trees, leave fires burning, tear down the notices which request caution, and show such a spirit of disregard and mischief that the owner is compelled to employ some one to care for the grove much of the time during the picnic season. This is an unreasonable burden, as the grounds yield no income or profit. It is probable that the abuse of the privilege here enjoyed by the public will lead to its withdrawal. A similar state of things exists in many places where the people are not sufficiently enlightened and public-spirited to make a proper and rational use of parks and open spaces for public resort. Among an orderly population the expense of caring for sylvan reservations of this kind is very slight.

Manchester has several open spaces of various kinds which are the property of the town, and are used as places of public resort. One has an area of perhaps seven acres, and is used for picnics. There is also a picnic ground at Tuck's Point, one-fourth of an acre, which is a town landing, used as such since 1730. There is a building here, fifty feet by twenty, for tables, etc., and the town provides a janitor. This feature I have not observed elsewhere. There are several other tracts—seven acres on the plain, bought with the idea of having the town Poor Farm there, but not used for that purpose; Old Neck Beach, more than half a mile long, with adjoining land, of varying width, running up the shore; Lobster Cove Landing, two hundred yards of shore, and the ground the powder-house stands on. The people talk of selling some of these, as they think the town has more land than it needs, or can afford to keep. One of the most valuable and interesting of the public holdings of the town, and highly appreciated by the people, consists of a belt of land along each side of the highway between Manchester and Essex. This was purchased a few years ago in order to preserve the woods along this road, which were then about to be destroyed. Their preservation is the result, chiefly, of the efforts of a few thoughtful women in the neighborhood. The title to the property is vested in the town, and the deeds have been deposited in the office of the Town Clerk.

The only public holding of importance in the town of Beverly is West Beach, which belongs to the West Beach Association, incorporated by a special act of the Legislature in 1852. This corporation is composed of all the resident inhabitants of the East Farms School District in Beverly, and of the people of a designated portion of the West Farms School District, and it is authorized to take and hold all that portion of the sea-shore, beach and flats of Beverly Farms which is included in the limits defined in the act of incorporation. There may be five or six acres of the land, but, I think, scarcely so much. Nobody appears to know how much there is. It is part of the land, beach and flats originally granted by the town of Salem to John West in 1666, and the title has ever since then been in him and his heirs and legal successors. The members of the corporation may use and occupy this piece of sea-shore for boating, bathing and gathering drift-stuff and sea-weed, and they are required to keep in good repair a certain small piece of road or causeway for public travel and a few rods of sea-wall, not a difficult or costly requirement. I find nothing in the act of incorporation requiring the association to take care in any other way of the property to which they are thus given title, and it has a neglected and unattractive appearance on the

landward side. Much of the area is overgrown with weeds, which, when I was there, were tall enough to conceal a group of artists who were sketching the sea view, which nothing can spoil. The place might be made much more attractive and valuable to the people who have a right to go there, especially to the women and children, and I think the act of incorporation should be so amended as to require the association to take reasonable care of the property and to keep it in a neat and orderly condition.

There is no common or public holding in the region which is still marked Beverly Common on the maps, nor has there been in any recent time. I think this reproduction and perpetuation of old terms by successive map-makers is probably the source of the popular notion or impression that there are still considerable areas of common or undivided town-land in many towns in Massachusetts. The Trustees of Public Reservations were made a corporation for the purpose of acquiring, holding and opening to the public "beautiful places and tracts of lands," and if we are to have anywhere a reservation for beauty and the delight of those who love beauty, I know of no place in the state better adapted to such uses than this region of high rocky pasture and encompassing woodland. The distant view is fine in every direction, and the whole of the vast visible landscape is full of character, strong, alluring, tonic and satisfying. It is a place for artists and for people with a developed sense of the beauty and value of fine scenery. Of course, it is good to be out-of-doors almost anywhere, but here there is the inspiration of natural beauty of a vivifying character, and the consenting soul of "the wide aerial landscape" speaks to the soul of the beholder. I wish the trustees might visit and examine the region, and that lovers of the out-of-door world might explore it and note their impressions regarding it.

Salem has a pretty common in the most populous part of the city, nine acres of sward with trees encircling it, paths and seats. It is for people on foot only, and is quiet and pleasant for women and children. It is, I believe, the old training-field. 2. The Willows, on the shore, said to contain thirty acres or more, adjoining the town farm or almshouse grounds. It is reached by a street-railway from the city, and is resorted to by throngs on summer nights. The area is not so large as it should be, but it is one of the most valuable of all the public holdings on the New England shore, and the cost of maintaining it is very small. The annual appropriation for this purpose is about $1,200. The rents from eating-houses, etc., amount to $800 a year. The real annual cost to the city is thus only about $400. Yet the people of the adjacent suburb of Juniper Point would like to see this place of resort closed. 3. There is an area of two and a half acres on Liberty Hill, in North Salem, with a few fine trees and a spring of very cold water, but the place is neglected, uncared for and abused. A park or common is needed here, as there is a populous suburb near by which has no other place of resort. When I was there on a hot afternoon in August a party of women and children came up at the same time, tired and thirsty, but a huge dog was laving in the spring, and the children had to wait till the water ran itself clear again. The city's neglect of this valuable property is sure to result in its injury and depreciation.

The region formerly known as Salem Great Pastures was held as common land in early times, but it was all divided into private holdings long ago. Much of it is still used for pasturage. It is separated into two parts by the occupied and inhabited belt along both sides of the highway leading to Lynn and Boston. It is to the portion on the eastern or shoreward side of this belt that Salem will probably look for the territory for new parks and commons in the future. I could not learn why it is not thought judicious to anticipate these future needs—which, indeed, already impress most observers—and to purchase the land which will be required while it can be obtained at small cost. There is much complaint by the working people of Salem that they are of late hunted and driven from all the places along the shore to which, from time immemorial, they have been accustomed to resort for small picnics and excursions and family and society outings. Several members of the police force say they are tired of being sent to drive away little parties of quiet and orderly women and children at the behest, as it often happens, of persons who have themselves no real title to the lands from which they want all visitors expelled as trespassers. There is need of additional public holdings on the shore in this region; for a small party to go to The Willows is often about the same as trying to have a picnic in a crowded street or public hall.

Salem is historically one of the most interesting places in New England. Some of the old houses have been destroyed which should have been preserved, but of course they could not all be kept forever. It costs money to acquire these old houses, and to take care of them. To the house in which Hawthorne was born, so I was told, an admission fee of twenty-five cents is charged each visitor. The prevalence of the witchcraft delusion here was a most sad and pitiful episode in the town's early history.

The officers and workers of the Essex Institute and those of the Peabody Academy of Science have done and are doing most useful work in stimulating and extending historical research and in promoting the temper and spirit which make history worth preserving. There are many objects of great interest and value in their museums. Mr. John Robinson, who is treasurer of the Peabody Academy of Science, has recently written a series of entertaining articles on the trees of the region. It has been published in the Salem *Gazette*, and it should now be issued in a more permanent form so as to be accessible to the public. Mayor Rantoul expressed much interest in the aims of the Trustees of Public Reservations.

Boston, Mass. *J. B. Harrison.*

Exhibitions.

Chrysanthemums in Boston.

BOSTON has never seen such a magnificent display of Chrysanthemums as those which last week filled the two halls of the Massachusetts Horticultural Society. For several years the liberal prizes offered by the society for this now popular flower have brought together very remarkable displays, but all of them have been eclipsed by that of this year. The specimen plants, perhaps, were no better than the best of Mr. Hunnewell's collection of last year, but there were more high-class plants in this year's exhibition, and the average of the whole was far better than anything seen in Boston before. It is a question, perhaps, whether the modern fashion for big blooms has not destroyed some of the real beauty of the Chrysanthemum; it certainly is a fact which no one with any sense of proportion will be able to dispute that a single spindling stem six or eight feet tall surmounted by one flower is not of itself an object of beauty, however great may have been the skill of the gardener who produced it; but allowing that size and substance of plants and of flowers is the chief aim of Chrysanthemum-culture, then the Boston show was as remarkable an exhibition of these flowers as the country has ever seen. It should be added, however, that while tall plants which carry a single flower are not objects of individual grace, there is yet one sufficient reason for cultivating some Chrysanthemums in this way. When several of these long-stemmed plants are cut and intelligently grouped in a vase, the flower is used to its best effect for decorating large rooms.

Cut flowers principally decorated the lower hall, and potted plants the upper, and in each the arrangement was excellent, both in the general effect produced and in the opportunity given to examine the different specimens in detail. The principal contest was in the competition for the prize offered for twelve specimen plants, as it has been for some time an open secret in the neighborhood of Boston that two of Mr. Hunnewell's sons were making extraordinary efforts to produce the best plants for this class. They had no serious competition, and Mr. Walter Hunnewell, whose plants last year were the admiration of every one who saw them, secured the first prize, and Mr. Arthur Hunnewell the second. The first-prize group consisted of short broad plants, with the exception of one splendid specimen of Louis Boehmer, the handsomest plant in the whole exhibition, all in the very pink of condition, but it seemed to us not quite as good, on the whole, as the plants which took the first prize last year. Mr. Arthur Hunnewell's plants were taller, some of them more than six feet high, but they lacked something of the finish which always characterizes Mr. Hatfield's Chrysanthemums.

Of the seedlings, which were shown in great numbers, few were particularly distinct, and it is plainly difficult to originate anything much better than what already exists in any of the strains which our florists are working. Of the seedlings displayed this year for the first time it is needless to speak, as very few of them stand the test of a second season, and no Chrysanthemum is worth propagating until it has flowered during at least two years. Of such plants there was nothing finer than A. H. Fewkes' Beacon, an immense white flower, fully ten inches across, and very solid and compact. It belongs to the incurved Japanese section, in which, also, were the following: Mrs. Jerome Jones, a large white flower, raised by H. A. Gane, Esq., of West Newton, Massachusetts; Pitcher & Manda's Harry May, and an excellent bronze yellow flower named Walter Hunnewell by its raiser, Mr. J. T. Hatfield. A very fine specimen of the last, and perhaps the most interesting plant in

the exhibition in the first-prize group, showed that it is a vigorous grower and well suited for exhibition purposes.

Besides the Chrysanthemums there were splendid displays of Roses from F. R. Pierson, of Tarrytown-on-the-Hudson, New York; from F. C. Cutts, and the Waban Rose Conservatories. There were Carnations from H. E. Chitty, of Patterson, New Jersey; Edward Swayne, of Kenneth Square, Pennsylvania, and others. Special collections of cut Chrysanthemums in competition for the special prizes offered by the Boston Gardeners' and Florists' Club were remarkably fine.

Besides the awards already mentioned, the principal prizes for plants were given to Francis B. Hayes, Dr. C. G. Weld, N. T. Kidder, John L. Gardner, Dr. H. P. Wolcott and Joseph H. White. For cut flowers the leading prizes were awarded to S. J. Coleman, Charles V. Whitten, Pitcher & Manda, E. A. Wood, John Simpkins, A. H. Fewkes, Dr. C. G. Weld, Joseph H. White.

Chrysanthemums in Philadelphia.

IT would be hardly fair to make a comparison between the exhibition last week at Philadelphia and the one the week before in New York. The entire collection at Horticultural Hall could have been almost hidden away in some corner of the vast floor-space of Madison Square Garden, and yet the display lacked neither size nor variety, and it was pervaded by a certain air of finish and refinement which is rarely seen. It would be fortunate for New York if the treasures of the private greenhouses in its neighborhood could be displayed on occasion to the delight and instruction of the public just as those of Miss Baldwin, Mr. A. J. Drexel and Mr. George W. Childs can always be counted on to add to the interest of an exhibition in Philadelphia. Enough plants were sent from the greenhouses of Miss Baldwin and Mr. Drexel to fill two long tables, and every one of them showed the skill of William Joyce and James Long, the well-known gardeners of these establishments. To mention the noteworthy specimens would be to give a catalogue of the entire list. Every plant was clean, thrifty and perfect after its kind. These collections, with some magnificent Palms which Mr. Hughes brought from the garden of Mr. G. W. Childs, together with the admirable collections of commercial greenhouse plants, sent by H. A. Dreer and William Ball, helped to form from different points of view an admirable background to the bright flowers, and softened the glare of color which would otherwise have been unpleasant. The stage was very beautifully arranged with masses of well-grown yellow Chrysanthemums, with abundant foliage banked against a line of Palms and Dracænas and other greenhouse plants, while in front was a stage of rare and beautiful Cacti, such as Mr. A. Blanc alone can furnish.

The Philadelphia exhibitions have always been strong in specimen plants. This year's collection hardly seemed to us equal to the one of last year; but, as usual, Mr. James Verner, gardener to A. J. Drexel, easily won the first prize for the best collection of ten plants of ten varieties. These were strong and symmetrical specimens, each one filled with flowers that were almost uniformly at their best. The plants of this collection were Mrs. Irving Clarke, Frank Thompson, Kioto, Robert Bottomley, President Harrison, Mrs. M. Wheeler, Lilian Bird, Puritan and Cullingfordii. Fine specimen plants were also shown by W. K. Harris, H. G. Standen, J. W. Colflesh, John McCleary, H. B. Surman, Gebhard Huster and Thomas Monahan. Mr. Verner took many prizes in other classes besides the principal one for ten varieties. It was noted by many of the experts present that the variety President Harrison, although the single flowers were not of the most attractive kind, showed admirably in specimen plants. Plants of Ruthven were also noteworthy for quality.

The cut flowers were never excelled; and, indeed, we have come to expect every year that they will be an improvement on those of the year before. All the old kinds were done so well that there is hardly any reason for selecting any of them for especial mention, although the vase which contained a group of the blooms of Frank Thompson could hardly escape notice in any company. For cut flowers the chief prizes were taken by James Heacock, Hugh Graham, Dailledouze Brothers, George Craig, J. W. Colflesh, Fred. R. Sykes. Silver medals were awarded to Hugh Graham for the Chrysanthemum Roselyn, an immense pink incurved flower, which had only one rival in its class, and that was Maude Dean, which seems to have a little more decided color; to T. H. Spaulding for Emily Ladenburg, the dark velvety red variety, which has already been described in our report of the New York show; to Robert Craig for Lewis Childs' Madeira, a bright yellow plant of perfect form, and probably the best Chinese incurved flower of the year; to Robert Craig for Mrs. Robert Craig, a flower of great depth and substance; to Peter Henderson & Co. for the Golden Wedding, an importation from Japan and a flower of the largest size, high in the centre, with the petals rather incurved and loosely twisted, while the outer ones are reflexed and somewhat drooping—a bold flower, of uncommon form and great sturdiness in stem and foliage; to the same firm for Good Gracious, a flower imported in the same lot, and which may be described as a large pink Kioto; to H. B. Surman for an immense yellow incurved flower of the very largest size. Certificates of merit were awarded to Hugh Graham, T. H. Spaulding, Robert Craig, Peter Henderson & Co. and Harry Surman for new Chrysanthemums.

The display of Roses was admirable for the season, and so were the Carnations of Mr. Thomas Butler, H. E. Chitty, Dr. Williams, Edwin Lonsdale and others.

Recent Publications.

Glimpses at the Plant World. By Fanny D. Bergen. Illustrated. Lee & Shepard, Boston.

It is amusing for older persons to look through a little book like this and see the pleasant ingenuity displayed in its treatment of facts which they have learned through dry scientific statements. But it is a question, perhaps, whether books of its sort do much of the good they are intended to accomplish. For they are evidently intended not merely to amuse children or to interest them in a broad way in the vegetable products which surround their summer steps, but to give them some definite knowledge of fundamental botanical facts. "Knowledge made easy" may be discussed, we think, in a general way as regards its beneficial effects upon youthful minds. It does not seem certain that such knowledge does more good than it does harm by vitiating a child's conception of what education means. Real knowledge can be gained only by real study, and real study is hard work, though good teaching may make it delightful work as well. To accustom a child to the idea that in swallowing bits of information sugared and gilded into the likeness of amusing literature is, we think, to labor against the formation of those truly studious habits of mind which early education should chiefly address itself to nurturing. Aside from the mastering of the three Rs the chief thing a child can learn in its first school years is simply how to learn. Not until its mind is better developed can it amass much information that will be profitable through life, while if right habits of study and a right conception with regard to what study means are not formed before the mind is developed the chances are great that they will not be formed later on. Of course, it will do a child no harm to peruse a few books like Miss Bergen's "Glimpses at the Plant World," for the information it gives seems to be accurate. All we intend is to protest against the idea that books of its class are in the true sense educational, to point out the danger that teachers and parents may come to trust too largely to their efficacy, and children may be persuaded to believe that when they have easily picked up a few scattered fragments of information they know something about the subject in question. Left to themselves, however, children are not likely to make too much of such fragments, for they are very likely to pass them wholly by. Instead of picking out, as they were expected to do, the kernels from the sugary mass, they will most often throw away the kernels and delight themselves simply in the sugar that surrounds them.

Every time, therefore, that we see a book of this sort we wish the enthusiasm and conscientious labor that had been put into its making had been a little differently exercised. Simple books about natural phenomena can play a wholesome and important part in the development of infantile intelligence, and this in two different ways. They can describe the pretty or amusing or odd or interesting things that a child sees in its walks so as to awaken the imagination, excite curiosity and quicken powers of observation. This service is performed by many passages of Miss Bergen's book. But we think its excellence would have been greater had she contented herself with this and not attempted to explain the scientific significance of this fact and that, or to give names to such things as the parts of a flower. A little mind will be only confused or repelled by the addition of such nuggets of fact, and even were they all to be assimilated its stock of information would not be enlarged to any valuable extent. The right effect of a series of informal talks about plants ought to be the impression that interesting things can be learned about them at the proper time and in the proper place. It ought not to assume any part of the office of an elementary botany; it ought simply to prove

to the child that botany must be an attractive study. This foundation once laid, the useful book of the second sort can be brought in play, and this of course is the elementary botany itself. This ought not to try to be amusing or to condescend to fanciful suggestions, poetic interpretations or the stimulating of mere curiosity. It ought to be simple and direct, systematic and scientific, although of course in its language, its choice of fundamental facts and its avoidance of all which can be left for later periods of study, it ought to be carefully adapted to budding intelligences. One such botany is, we all know, within the reach of every American child. No child too young to understand Gray's "How Plants Grow" is old enough to get valuable botanical information from other sources; and none who does not find it interesting will be charmed into botanical enthusiasm by the administration of sugar-coated pellets. The total separation of these two kinds of writing—of the kind which is meant to awaken interest from the kind which is meant to supply information—would, we feel sure, be of great benefit to the rising generation.

Notes.

A natural history society, with Mr. William M. Canby as president, has just been established in Wilmington, Delaware.

The English building on the grounds of the World's Fair in Chicago is to have the general character of an old English manor-house.

The popular French name for Cotinus is Arbre à Perruke, or Wig-tree, a term which expresses its peculiar appearance when covered with its abortive pedicels as distinctly, if not as prettily, as does the English term "Smoke-tree."

The Iceland Poppy shows its sturdy qualities by throwing up occasional blooms in spite of the frost. Perhaps the plants which are to bloom next spring would do better if they were kept from flowering the autumn before, but the flowers are very beautiful now amid the general desolation of November.

The beauty of the deep blue flowers of the low-growing and half-prostrate *Plumbago Larpentæ* has often been spoken of in these columns, but now that the frost has destroyed its bloom the plant is still beautiful for the bright scarlet of its foliage. A spread of a square yard or so makes a very brilliant spot at this season on rock-work or wherever else it may be planted.

About 10,000 corn-cob pipes are daily manufactured in this country, all being made in three factories, one of which stands at St. Louis, one at Greenwood, Nebraska, and the third in Kansas. The cobs are all procured in Missouri, and are supplied by the Collier variety of Corn, on which they grow usually heavy, woody and hard, while the stems are formed of the so-called Arkansas Swamp-cane or reed.

In a preliminary list of the plants of Franklin County, Ohio, lately made by Messrs. A. D. Selby and Moses Craig for the Columbus Horticultural Society, it is stated that 138 native plants and 85 introduced plants have been added to the number given in a catalogue made by William S. Sullivant in 1840. It appears that 15 per cent. of the plants of the county are introduced and that 8.5 per cent. of these have appeared during the last fifty years.

No more striking contrast to our beautiful rural cemeteries, filled with costly monuments and carefully tended plants, can be imagined than the City Cemetery of New York—the "Potter's Field," on Hart's Island in the East River. Here about 2,500 unknown and pauper dead are annually buried. There are some 75,000 drunkards' graves, and the most pathetic sight of all is the only monument, which bears sad tribute to the fact that some of the brave soldiers of the Civil War are here interred.

In the recently issued Proceedings of the Pennsylvania Academy of Natural Sciences a record is made of a double-flowered Skunk Cabbage (*Symplocarpus fœtidus*), and an illustration which shows the two spathes fronting each other is given in *Meehan's Monthly* for November. In the same magazine it is stated that in a Japanese work on botany there is a figure of this plant, which grows in Japan as well as in America, with two spathes, the outer one being a purplish violet with orange stripes within and darker lines without, and the smaller spathes in the interior striped with white and having a greenish border.

We have received from Mr. Joseph Meehan a branch of *Elæagnus umbellatus* which is thickly covered with fruit. This plant has been distributed very abundantly during a few years past as *E. longipes*, which, however, it does not resemble. It is much more like the one known as *E. parvifolius*, but this ripened its fruit more than a month ago, while *E. umbellatus* still has fruit on it, which will be frozen off before it ripens. The berries, as they came to us, were of a beautiful amber color, thickly set along the stem and about as large as currants. The fruit adds much to the ornamental value of this shrub, which is beautiful at all seasons of the year. The plant from which this branch was taken is in the garden of Mr. A. G. Elliot, of Germantown.

The little park known as the Bowling Green in this city originally lay in front of a fort built of logs in the year 1615, which, in 1626, was replaced by a store-house surrounded by palisades of Red Cedar, and was used as a drill-ground. In 1732 the ground was leased to residents of the neighborhood and converted into a bowling-green, and in 1770 it was chosen as the site for a leaden statue of George III., which had been sent from England, and was surrounded by an iron railing, for which the city paid £800. On the evening of July 9, 1776, when the Declaration of Independence was read from the City Hall, statue and railing were demolished by the excited populace, and the pieces of the former were sent to Oliver Wolcott at Litchfield, Connecticut. Here Wolcott's wife and daughter cast the lead into 42,000 bullets, and it was believed that four hundred British soldiers met their death by missiles which had once formed part of the statue of their king.

In eastern New England this year the autumn foliage of trees and shrubs is less brilliant than it has been in several years. The foliage of many trees, especially of the Ash, the Hickories, and the Virgilia, all of which usually turn to brilliant shades, was killed by a hard frost in the last week of October before they had changed color at all, and these trees are now generally leafless. The leaves, too, have fallen from many Maple-trees, both Red Maples and Sugar Maples, without any previous change of color. The Oaks, however, promise to turn as usual, and just now some White Oaks and the Chestnut Oak which, with its deep orange autumn color, is always one of the most beautiful trees at this season of the year, are particularly noticeable. The Red Oak and the Scarlet Oak turn later. It is interesting to note that in spite of the hard frost the Gleditsias still hold a large part of their leaves, which are almost as bright green as they were at midsummer, while its nearest relative, the Kentucky Coffee-tree, is quite leafless.

In an article recently published in the New York *Sun*, contrasting this year's fair of the American Institute with the one held fifty years ago, it is said that in the Floricultural Department of this latter the most striking attractions were "thousands of specimens of what was called 'that fashionable and esteemed flower, the Mexican Dahlia,' in all its varied shades. It was considered worthy of mention that the root of the Queen Dahlia had cost £10 the previous spring. G. C. Thorburn was credited with having imported the majority of the stock, or parent plants, cultivated in this country at the time. . . . Of the forty premiums for agricultural and horticultural products Thomas Addis Emmet, one of the most famous lawyers of the time, got a diploma for the best purple Egg-plants, William Niblo got a copy of Downing's 'Rural Architecture' for the greatest display of tropical fruits, and Niblo and Dunlap got a diploma for the best self-colored and various-colored Dahlias. . . . Among the exhibits of garden ornaments were 'splendid specimens of stained glass peculiarly adapted to the highest style of garden architecture.' The making of stained glass had been introduced here only a few years before. A cast-iron sun-dial was described as 'a very useful article to any one who sets a due value on his time. When its cheapness is considered, we should think it strange that any person who has a situation in which to place it should be without one.' An iron case was considered a valuable ornament where stone pillars were used, as in gardens and parks. Some iron settees were described as 'entitled to rank among the luxuries of life.'" But the "climax in garden ornaments" seems to have been an enormous cast-iron fountain composed of groups of "female figures of great beauty," with Tritons spurting water ranged about an upper basin. Among other exhibits of importance "were Amazon bonnets made of so-called Manilla-grass, which was the fibre of Aloes. The braids were both white and dyed, and the judges could not too highly commend its exhibitors for originating and bringing to its state of perfection a fabric of so much importance."

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How a Village Gained a Park.

LIKE many of the very old towns lying near the great cities which cluster about the harbor of New York, the village of Jamaica, on Long Island, has a reputation for staunch conservatism. During the present year, however, it has been the theatre of a progressive movement which is worthy of being placed on record as an example of public spirit and prompt activity. Last winter a lady who lives in the village organized a society known as the Linnean Club, which had for its objects "the diffusion of botanical knowledge, the encouragement of floriculture, and the preservation of our native plants, shrubs and trees," and to promote these worthy objects the founder of the club gave "little talks," as she modestly called them, every other week, alternating with another member, who, like the founder, was a member of the Torrey Botanical Club of this city. These meetings proved attractive, and, what is better, they proved instructive and stimulating, and soon the club numbered some forty members. The idea of cultivating wild flowers and American plants suggested the advantage of a public place to grow them in, and this thought soon germinated into a conception of the necessity of something like a botanical garden or park for the Linnean Club and for Jamaica. The club could own no real estate, but advantage was taken of the law in this state, which was passed in May, 1888, to meet such emergencies, and to which we have often alluded before. This act enables any fifteen or more citizens, under certain restrictions, to secure lands for parks and playgrounds independent of municipal authority. These corporators can acquire property, by gift or otherwise, to the amount of half a million dollars, and such additional amounts as may be authorized by the Mayor and Common Council of any city or the Supervisor of any town in which it is proposed to establish such parks, and they are clothed with the power to employ officers for enforcing order and compliance with their rules. Fifteen members of the Linnean Club, therefore, incorporated themselves under this act as the Highland Park Association, so that they could take possession of the land which they had determined to secure, and two weeks ago a deed for this land was formally delivered to the corporators as a part of the festival exercises at the first flower-show of the Linnean Club—and the first flower-show ever held in Jamaica.

Jamaica lies just south of the range of hills which forms the backbone of Long Island and gives character to its scenery. Twenty years ago these highlands were well clothed with trees, but the forest-growth has gradually been swept away and the slopes have been turned into streets and building lots. On the summit of the range, just opposite the central part of Jamaica, lies a pond, which has been called from time immemorial the Goose Pond, because its shape had a fancied resemblance to the outline of that bird, where the village boys used to skate in winter, and swim and gather Pond Lilies in the summer. This pond, with half a dozen acres of land at one side of it, was the park area coveted by the new association, who wished to preserve from being covered over and blotted out the most interesting feature of natural scenery near the village, and to save for the boys and girls of the future the grounds where the boys and girls, who are now men and women had been free to gather nuts and wild flowers. Fortunately, the owner of the land was generous, and, being a native of the village, he held his birthplace in affectionate remembrance, although he now lives in a distant state. He, therefore, not only placed a low valuation upon the land, but subscribed half the sum needed to purchase it. The club went energetically to work to raise the other half, and gave all their neighbors the opportunity to help according to their means, the individual subscriptions ranging from two dollars and a half to a hundred dollars, and now Highland Park is public property, held in trust as a pleasure-ground forever by the fifteen corporators and their successors.

Of course, much remains to be done. The park would be worth a great deal more if additional land could be purchased, enough, at least, to include the entire shore of the pond within its boundaries. The time will come when there will be some grading needed for the playground, and, as the old trees are all gone, there must be some planting, or, at least, some care of the saplings which have already sprung up upon the tract; but the townspeople can be trusted now to improve their pleasure-ground and keep it in order, and their interest in it and affection for it will grow with the care they bestow upon it. The fact upon which the people of Jamaica are to be congratulated primarily is, that this area, at least, is rescued and held for public use, and their successors a century hence will hold in grateful remembrance the public-spirited women who have preserved this little section of the hill's crest to show the original conformation of the land.

Two or three phases of this work seem to us to deserve special mention. In the first place, the Linnean Club is composed entirely of women. The fifteen corporators who have acquired this park-property by purchase are all women. It is not strange that the need of a public garden should have made its first appeal to the finer sensibilities of women, but no association of business men could have carried the work through with greater effectiveness of organization or promptness of execution. Let us hope that it may occur to the women in many another town that they can accomplish as much in the way of local improvement by co-operative effort as their husbands and brothers can.

Again, it is to be observed that this was not originally a movement for a park, but it was an effort to increase the love of natural objects, and yet it was distinctly out of this that the conception of the need of a public park grew. Here is another hint of the value of organization for encouraging the study of nature out-of-doors and at first-hand. Such study is wholesome in a general way; it opens the mind to good influences, it draws away the thoughts from what is artificial and gives freer play to those elementary instincts which attach us to the soil and

enable us to enjoy those simple pleasures which come from sympathetic contact with the woods and fields; it has a special value in creating and directing sentiment in favor of public parks and gardens for towns and cities.

The Linnean Club has taken special pains to interest the children. This has been done in many ways. The idea of a playground has been a fundamental one throughout the whole discussion. In the beautiful flower-show which was held about a fortnight ago the prizes were not given to professionals, although the local florists kindly helped to make the show attractive, and one of them, at least, offered premiums for competition; but prizes were offered for wild flowers gathered by the children and for plants cultivated by persons under sixteen years of age. This not only encouraged the study of plants in the most practical way, but it insured the help of the children in the work of winning a park. The public schools entered heartily into the project for a pleasure-ground which was to be a place for the amusement of boys and girls as well as for grown people, and one of the most interesting features of the final ceremonies was a contribution of fifty dollars raised in small sums from the pocket-money of the pupils in the public schools. The children who gave their mites for Highland Park will not forget to care for it when they become men and women.

Jamaica was in special need of this public playground, and many other villages which lie just beyond the suburbs of rapidly growing cities have a like need of speedy relief. Even now there is often as little space in these suburban villages for public recreation and the playing of children as there is in compactly built cities. The great cities are steadily sweeping about them, and soon the whole area will be covered with compactly built business blocks and dwellings. The cost of securing open spaces will then be enormous. Even ordinary forethought suggests that park areas in such places should be secured at once. Wherever there is such a village there is room for a Linnean Club.

A description of the new Grant monument in Lincoln Park, at Chicago, recently published in the *American Architect and Building News*, well illustrates the importance of carefully considering the site and the architectural base if a statue is to produce a good effect. As a rule, our statues are injured by bases of insufficient size and dignity, but in this instance the designers seem to have fallen into the opposite error. "The Grant statue," says the writer, "is situated at the eastern side of Lincoln Park, close to the great lake. There has been partially completed this year, outside of what was formerly known as the Lake-shore Drive, a road with water on each side, the actual lake on the east and a stretch of smooth water on the west. In passing, it may be mentioned that this drive is a most wonderful piece of masonry, stretching, as it will, for over a mile, with a stone esplanade on the side toward the lake and a paved beach beyond sloping to the water's edge. It is from this walk and drive that the most comprehensive view of the monument may be obtained, and a slight feeling of disappointment is felt at the insignificance of the bronze compared with the stone. Viewed still closer from the old Lake-shore Drive, where the details of the substructure can be noted, the feeling of disappointment increases, and one is sure that the horse and rider lack that one kindling spark of genius that would lift them above mediocrity." However, the writer continues, when one mounts nearer yet on the road that leads over part of the substructure it is seen that there is "a spirit and strength in the handling of both horse and rider that one would never guess at in viewing the work as a whole," and he decides that the work of the sculptor, Mr. Rebisso, deserves high praise. "The entire trouble," he explains, "is with the substructure, which is so enormous that it dwarfs the actual statue. The possibility of obtaining a comparatively near view of the work makes it undesirable that the handling should be of the broadest; but at the height that it is raised above the spectator at most points, only the strongest work would be effective. Add to this that the belly of the horse and the soles of General Grant's boots were not the parts of the statue, doubtless, that the sculptor wished brought into the greatest prominence, and one can easily see that the effect of the work is lessened by the great height of substructure. If one approaches the statue from the back door, so to speak, up a gentle incline, where low trees cover the principal part of the granite-work, the fine effect of the horse and rider will immediately prove to the even careless observer how much the too extensive masonry detracts from the work of the sculptor, especially when the masonry be of such a crude and harsh character."

A large photograph of the monument, subsequently published in the same journal, confirms its correspondent's words. It shows a stone bridge, with a single round arch which appears to span a lower road, while the main road that it bears is conducted beneath a structure which is more properly to be called a building than a pedestal. With a large round arch at either end and an arcade of five on the longer face, its exact character is hard to explain. As a building it seems to have no special purpose; as a substructure for the statue it is utterly inappropriate. It is encircled by a sort of balustrade, and from the centre of its top rises the true pedestal, bearing the statue so far above the eye that one can well believe it may be a better work than it thus appears to be. Moreover, the whole construction is not only "crude and harsh" in the character of its masonry, but rude and barbaric in design. It exhibits that unfortunate tendency to which we called attention a few weeks ago — the tendency to mistake excessive massiveness for strength, heaviness for dignity, lack of refinement for simplicity. We suppose it would be called a Romanesque design. But no Romanesque builder in any community which had really preserved a memory of Roman civilization, or had evolved from the ruins of this a new civilization of its own, would have designed in such a manner a civic construction the purpose of which was professedly ornamental. These enormous, rough-faced stones; these clumsy angle-shafts; these ponderous arches springing from imposts that are mere rude blocks; these primitive attempts at cornice and balustrade, look like the creations of some rustic builder in a land and age when art was but a memory or a prophecy, when refinement was unknown, when manual skill was at as low an ebb as the power of skillful designing. As a feature in the pleasure-ground of a civilized, nineteenth-century town the cyclopean rudeness of the structure must equally disturb the mind and the eye, while nothing more inappropriate in size and character could be imagined as a support for the statue of a modern man. When we add that this work actually prevents the spectator from taking any point of view from where the statue can be well seen, we must conclude that the art of placing monuments in the open air is not yet universally understood in America.

The Shrubbery in November.

IT is now the middle of November, and our deciduous trees are all bare except the Birches, Beeches and the Oaks, and the foliage of these last has lost its brilliancy of tint, and they are settling down into the sober sadness of their brown and russet winter garb. The Birches still have a sparse covering for their upper branches, and the lower limbs of the Beeches are clothed, while the upper ones are bare. The brightest green foliage still decks the Plums, and some Robinias retain their summer robes, but much the worse for wear, shrunken, faded, tattered and forlorn. The Purple Fringe, a charming small tree, is now beautiful in full dress of orange; it is also remarkable for the exquisite soft, pinkish hues of their translucent young leaves in April, and I know of no tree which will give more pleasing variety in a season's growth.

On descending to the shrubberies I find some Weigelias, Kerrias and Euonymuses still holding green leaves, while Forsythias have a deep plum-colored shading, and the California Privets, which have not shed a leaf, are purpling in striking contrast to a group of Thunberg's Barberries, cheery with

sprays of orange and scattered scarlet berries, which are a god-send to the vagrant birds.

We possess a specimen of *Enkianthus Japonica*, which was very beautiful a month ago, but is now in winter bareness. Its foliage turned to a uniform blood-red, making it more showy than a Dahlia. The tips of the leaves turned first, as did those of a fine *Parottia Persica*, its near neighbor, which is now in full splendor of handsome persistent foliage, irregularly marked with shades of crimson and gold. These two rather rare shrubs are of easiest culture, and I know of none that are more valuable for autumnal effects.

Our Coluteas are still a lively green, and so is the grass, though we have had some sharp frosts. *Cytisus nigricans* retains vigorous leafage of a very dark plum color, almost black. Can this deepening of the foliage be the origin of its name? All Spiræas seem to keep their summer dress until very late, and all are desirable for this and many other good points. The old-fashioned *Spiræa prunifolia* has now shed most of its leaves, but *S. Thunbergii* is exceptionally beautiful, with light yellowish red shades and fairy delicacy of growth. Near by a mass of *S. Lindleyana* is fast losing its golden sprays, while the little *S. Bumalda* and *S. callosa alba* are scarcely changed, except that their leaves have lost their pristine freshness of appearance.

Fontanesia phillyræoides is a rich dark green, and *Hypericum patulum* makes a pleasing spot of verdure for the eye to rest upon. The Golden Elder is golden still, and the Witch Hazel is adorned with tassels and fringe, which do not wear as well as its tiny, inconspicuous yellow florets, which are the calyxes and will remain all winter to protect the ripening seed. The leaves have shriveled long ago. Very golden and strikingly handsome is the Ramanas Rose, while its Himalayan cousin, which shoulders it in our lower shrubbery, is a bright shade of orange, very distinct, as the florists say.

Chimonanthus fragrans is unchanged. It is to be left out all winter—perhaps a dangerous experiment, with no protection except leaves and limbs of trees to keep the mulch in place. This shrub is hardy in England. Although our winters are sometimes very severe, with the thermometer occasionally below zero, our southern Jessamine lives and flourishes with no protection except what is kindly afforded by the autumn winds that heap the withered leaves about its feet. The Iteas are still handsome, in dull red, to which *Elæagnus longipes*, with its grayish foliage, forms a striking and beautiful contrast. Near by a group of Cotoneasters are showy in their dark rich crimson shadings.

Very interesting still are the shrubberies, with changing combinations and lovely effects, delightful to an eye that appreciates color. Many berries add to their beauty; among them the bright hips of the Wild Roses and Sweet Briers, the red and yellow uniform of the Bitter-sweet, and the fiery glow of some Euonymuses are especially noticeable. A variegated Ampelopsis has metallic greenish blue berries, which are pretty and persistent, and the Saint Peter's-worts are sprinkled with white and red berries, which remain until very late in the winter. With a judicious admixture of Evergreens, the shrubberies may be made attractive at all seasons, and one can have endless enjoyment in watching their transformations.

I must not forget the rich verdure of the Honeysuckles and the elegant *Akebia quinata;* nor the Japanese Alder, which is now conspicuously green, with its curious cones and catkins; and I must spare just a word of appreciation of the wild Blackberry-vines, rioting along the lanes, whose ruby wine tints are fairly glowing in the sunshine this sparkling November day.

Rose Brake, W. Va. *Danske Dandridge.*

Filices Mexicanæ.—IV.

THE following concludes the enumeration of the Ferns collected in the states of Nuevo Leon, Jalisco, San Louis Potosí and Machoacan, Mexico, during the seasons of 1888, 1889 and 1890, by Mr. C. G. Pringle, of Charlotte, Vermont. The notes and descriptions, as in former numbers, are by Mr. George E. Davenport, of Medford, Massachusetts.

Ophioglossum crotalophoroides, Walter (3405). Damp soil, near Patzcuaro, November, 1890.

Ophioglossum vulgatum, L. (1564). Moist places, foot-hills of the Sierra Madre, state of Chihuahua, October, 1887. (Received too late for inclusion in notes for that year.)

Osmunda regalis, L., no number.

Pellæa angustifolia, Baker (1836); also var. *cuneata*, Baker (2026 and 2588). All from Barranca, near Guadalajara, September and November, 1888 and 1889. Moist bluffs and shaded banks.

Pellæa flexuosa, Link. (2832). Dry cliffs near Guadalajara, November, 1888.

Pellæa intramarginalis, J. Smith, var. *serratifolia*, Hooker and Baker (1986). Shaded grassy slopes of Sierra Madre, Monterey, June, 1888. Tall, elegant specimens.

Pellæa Pringlei, *n. sp.* (2591). Rhizoma short, stout, crowns clothed with a coarse, tawny, fibrous tomentum; fronds 6′ to 16′ tall; stipites 5′ to 10′ long, straw-color, with brownish bases, channeled, naked or with a very slight deciduous pubescence; laminæ bluish green, 2½′ to 6′ long, 1½′ to 4′ broad at base, deltoid-ovate, pinnate, or the lower pinnæ sometimes again pinnatifid; pinnæ three to five pairs, with long straw-colored stalks like the stipites, deltoid-hastate, terminal ones generally one-sided or sub-hastate, but sometimes deltoid-hastate like the others, lower ones sometimes divided into two unequal divisions, or several times unequally lobed, or even pinnately divided into from one to three pairs of oblique-stalked pinnules, the terminal one also stalked; texture sub-herbaceous, the copious free veins plainly visible; costæ prominent on both sides; fructification continuous round the revolute bluish margins.

Habitat: 2591, cool mossy banks, Barranca, near Guadalajara, state of Jalisco, October 19th, 1889; also 2029, collection 1888. Dr. Palmer's 543 of his 1886 collection, which was referred to *P. cordata* with some hesitation, from depauperate specimens, by Professor Eaton, in *Proc. Amer. Acad.*, xxii., p. 463, is identical with Mr. Pringle's plant. The illustration on page 560 is from a drawing by Mr. C. E. Faxon.

Pellæa rigida, Hooker (3298). Ledges and bare banks, San Jose Pass, October, 1890; also 2602 of 1889 collection.

Pellæa Skinneri, Hooker (2831). Of 1888 collection; 2603 and 2586 of 1889 collection. Moist shaded banks, Barranca, June, September.

Phegopteris rudis, Mett. (1844 and 1984). Wet places, near Guadalajara, November, 1888.

Phegopteris tetragona, Mett. (3409). In a cave partially lighted, whence issues the Choy River, June, 1890.

Polypodium aureum, L., var. *areolatum*, D. C. Eaton (2022). On calcareous ledges and banks near Guadalajara, December, 1888; and 2582, from ledges, Sierra de Esteben, October, 1889.

Polypodium ellipsoideum, Fée (3404). On trees, hills of Patzcuaro, November, 1890.

Polypodium furfuraceum, Schlecht. (3356). On trees, Tamasopo Cañon, June; and 3357, on Oaks, hills of Patzcuaro, November, 1890. I am indebted to Professor Eaton's kindness in placing these numbers, and must confess that I would not so have placed them from the description in "Synopsis Filicum," with which the specimens are wholly at variance. Not only are the "soft spreading hairs" wanting to these specimens, but the rhizoma is clothed with *distinct broad scales* instead of "woolly fibrils," as called for in the description. There is no question, however, but that they agree with specimens heretofore referred to this species by Professor Eaton; from Bourgeau's, Ghiesbreght's, Mohr's, Palmer's and Farlow's collections, and I am well content to leave Mr. Pringle's in such good company.

Polypodium lanceolatum, L. (3358). On Oaks, rocky hills of Patzcuaro, state of Machoacan, November, 1890.

Polypodium lycopodioides, L. (3355). Climbing on shrubs, limestone hills of Las Palmas, October, 1890. A very large fine form, in which the fronds are frequently bifid, and the climbing rhizoma unusually stout, very different in appearance from the usual forms of the species, but agreeing very well with Ervendberg's No. 9, from Wartenberg, Mexico, 1858, a specimen of which Professor Eaton very kindly sent to me for comparison.

Polypodium plesiosorum, Kunze (2023). Cold mossy ledges, Sierra Madre, near Monterey, June-July, 1888; also 3354, from rocks and earth, hills of Patzcuaro, November, 1890, and, with this last, from same locality; 3352 (ticketed *Polypodium plesiosorum*, Kunze, var.), a remarkable form, with larger, broader fronds, more strongly serrated pinnæ, lower ones obtusely lobed, and the unusually stout rhizoma densely clothed with large, long and beautifully ciliated pale scales. I was at first inclined to look upon this as a distinct species, but finding similar specimens from Kew in the Cambridge herbarium marked with a query, I sent specimens of Mr. Pringle's plant to Mr. Baker, who has referred it to *plesiosorum*, but thinks it is distinct enough to make a good variety. Subsequent examinations have convinced me that he is right, and as some slight acknowledgment of the many courtesies received from him from time to

time I venture to name it var. *Bakeri;* hills of Patzcuaro, November 14th, 1890. The variety may best be recognized by the great size and beauty of the shaggy rhizoma.

Polypodium plebeium, Schlecht. (3258). Shaded ledges, Tamasopo Cañon, September, 1890; and 3351, on trees and rocks, hills of Patzcuaro, November, 1890. The two forms are quite different, and both different from specimens previously collected by Dr. Palmer; but the species is apparently an extremely variable one, embracing many forms.

Polypodium plumula, H. B. K. (3353). On trees and rocks, hills of Patzcuaro, November, 1890.

Polypodium sub-petiolatum, Hooker (3328). On trees and rocks, hills of Patzcuaro, November, 1890; and a somewhat doubtful form (3406), not safely separable from this species, was collected on the hills of Rio Hondo, August, 1890.

Pteris cretica, L. (1985). Springy places, Sierra Madre, near Monterey, June, 1888.

Pteris longifolia, L. (3359*a*). Calcareous banks and ledges, Tamasopo Cañon, November, 1890; and with it 3359*b*, var. *sub-bipinnata*, n. var.; the latter a very remarkable form, with the lower pinnæ longer than those above, pinnately divided, with the lower pinnules gradually reduced, as in a normal frond of the species, and the apices very much prolonged. Stipes and rachis stout, and especially at the base, and surrounding the crown clothed with a coarse shaggy wool.

Pteris quadriaurita, Retz (3411). Tamasopo Cañon, September, 1890

Scolopendrium nigripes, Hooker (3366). Mossy ledges, Tamasopo Cañon, November, 1890.

Plant Notes.

Our Native Nelumbo.

The Nelumbo of the Orient has so occupied the attention of the public of late years since it has become a familiar object in many public and private gardens that it is not always remembered that North America possesses a second species of the same genus. Less beautiful, perhaps, than its Old World relative, the American Nelumbo, or Water Chinquapin as it is sometimes called from a fancied resemblance of its seeds to those of the true Chinquapin, is one of the most interesting and striking of all hardy aquatic plants, and there are many ponds in the eastern states which might well be covered with its great circular cupped leaves and pale yellow flowers raised high above the surface of the water.

Nelumbo lutea is by no means a rare plant in the Mississippi basin and in many of the states which border the Great Lakes. It grows sparingly in the Connecticut River near Hartford and at a few other places in the east, although it was probably introduced by the Indians into eastern rivers, as it is so rare and local in this part of the country that it does not appear probable that it grew here without man's assistance. And the theory of the spread of this plant beyond its natural limits by the help of the Indians is the more probable because it is known to have furnished them with an important article of food in its farinaceous tubers and sweet, mealy seeds. These last are still gathered in some parts of the west and north-west and ground into flour. Dr. William P. C. Barton, of Philadelphia, published just seventy years ago in his fragmentary "Flora of North America" a beautifully colored plate of this plant, and in his description tells us that the boys about Philadelphia gathered the green and succulent half-ripe seed-pods from the marshy banks of the Delaware and found a ready sale for them among people who considered them a delicate and nutritious luxury. Perhaps some of the readers of Garden and Forest can tell us whether the Nelumbo is still found in Dr. Barton's station in the Delaware, or if it has, like many other plants, been forced to succumb before the march of civilization.

Our illustration on page 557, from a photograph made by Mr. D. Burnett, of Olney, Illinois, represents a pond in the southern part of that state covered with the Nelumbo in flower, and gives an excellent idea of how this plant appears on ponds and lagoons in many parts of the United States.

Foreign Correspondence.

London Letter.

Iron vs. Wood in Glass Houses.—A correspondent in the *Gardeners' Chronicle* this week raises the question, Why should not iron be substituted for wood in the construction of plant-houses? There is a general objection to the use of iron, because of its supposed contraction and expansion under the influence of heat and cold, the condensation of moisture inside and consequent production of "drip," and the excessive radiation of heat from iron as compared with wood. My own observation leads me to doubt whether these objections really have any foundation in fact. There are several large houses at Kew in which the rafters and sashes are wholly iron, and neither contraction nor expansion in them is sufficient to do any damage to the glass or even to loosen it. Drip is easily prevented by a proper pitch of roof, and by means of channels cast in the iron rafters Radiation is not easily measured, but I do not think there is any appreciable difference between the loss of heat from wood and iron houses; at any rate, the quantity of piping for the one is the same as for the other. On the other side, a great deal must be urged in favor of iron as compared with wood. First cost is, of course, greater; but an iron house need not cost more than, say, twice as much as wood, while it will last at least ten times as long, as is proved by the old Victoria house at Kew, which was built wholly of iron. Then comes the question of light, and here iron is immeasurably superior to wood. Sashes and rafters, if made of iron, may be so thin as scarcely to obstruct any light, and yet be strong enough for the largest houses and in the most exposed places. A wood structure, if lightly built, soon gets out of repair and is unsafe. In some gardens, famous for good cultivation, I know iron houses are in favor. I will mention one—that of M. Warocque, of Mariemont, near Brussels, whose splendidly cultivated Cattleyas, Odontoglossums, Vandas and other plants are the subject of a most eulogistic article in the *Gardeners' Chronicle* last week by no less an authority than Sir Trevor Laurence. The houses in which these plants are grown are iron, and that they are liked is proved by the fact that a new iron house for Cattleyas is about to be erected. I know the stereotyped objection to the use of iron for sashes and rafters, that it is bad for plants. But is it? Has any one ever proved it so? The three essential qualities in a plant-house are, I take it, durability, lightness and convenience. In two of these iron is superior to wood, and in the third I am inclined to think it is about equal.

[The tendency in America is steadily toward the most durable materials for greenhouses. The fear of losing heat by radiation from metal is considered groundless.—Ed.]

Effect of Fog on Plants.—The injury done to plants by winter fogs in the neighborhood of large towns has recently assumed quite alarming proportions. The subject has been under investigation by a committee of scientific men assisted by the Royal Society, and the first installment toward a report on the whole matter was contributed in the spring of this year by Dr. Oliver, of Kew. A second contribution to this end was recently made by Dr. W. J. Russell, F. R. S., in the form of a paper read before the Hygienic Congress, and which is now published in *Nature*. Dr. Russell deals with the whole subject of town fogs and their effects upon man as well as plants. An analysis of the fog-deposit collected from the roofs of glass houses at Kew, and which had been deposited in a fortnight in February, is most interesting. It is as follows: Carbon, 42.5 per cent.; hydrocarbon, 4.8 per cent.; sulphuric acid, 4.0 per cent.; hydrochloric acid, .8 per cent.; ammonia, 1.1 per cent.; mineral matter (silica iron), 41.5 per cent.; water, 5.3 per cent. Total, 100.0 per cent.

"These analyses give, I believe, for the first time a definite account of the composition of a fog-deposit. Soot and dust are by far its principal constituents, rendered sticky and coherent by hydrocarbons, but I should like to give

you the striking description which Professor Thiselton Dyer has sent me of this deposit He says, 'It was like a brown paint, it would not wash off with water, and could only be scraped off with a knife. It thickly coated all the leaves of the evergreens, and upon what have not yet been shed it still remains.' . . With regard to plants under glass the effect of fog is of two kinds: (1) That caused by diminished light. This checks transpiration. The plants are therefore in the condition of being overwatered. A well-known consequence of this is to make them shed their leaves wholesale. Many valuable plants which ought to be well furnished with foliage become perfectly bare, and it is impossible ever again to recover them into sightly specimens. (2) The toxic influence of the fog. This is most striking. I attribute it in the main to sulphurous acid, though I cannot help suspecting that some hydrocarbon may also have something to do with it. The toxic effect varies from one plant to another; some are scarcely injured, others are practically killed. I hope you will be able to arouse some interest in this horrible plague. If the visitation of last year is annually repeated it must in time make all refined horticulture impossible in the vicinity of London." That the number of fogs experienced in London is annually increasing is shown by the statement that while between 1870 and 1875 the number recorded for the three months December, January and February was ninety-three, the number for a similar period ending last year had increased to 156. Dr. Russell does not write hopefully of the possibility of getting rid of this winter plague. He says as long as coal is burnt we shall have dense fogs, and it does not appear probable that a substitute will be found for coal.

Fig. 87.—A Pond in Southern Illinois, covered with the Water Chinquapin (*Nelumbo luteum*).—See page 556.

Fruit.—Arrangements are being made to hold a great National and International Exhibition of Fruit in London in October, 1892. It is expected that all the English societies interested in the cultivation of fruit will co-operate to insure the success of this exhibition. A committee has been appointed to formulate a scheme, and a guarantee fund has been started. Should the scheme be practicable, and there does not appear to be any reason why it should not, this exhibition ought to prove an important event in horticulture, and even in agriculture, for there are signs now of the cultivation of fruit being taken in hand by farmers. Sir James Whitehead has almost promised on behalf of the corporation the use, free of charge, of a site on the Thames embankment for the exhibition, which will be extended over a period of about ten days. It is anticipated that the foreign section of this exhibition will be a prominent feature, and among foreign growers of fruits for the English market the United States occupies a very prominent place. No such exhibition has been held in England since 1866, when a great show of fruit was held in London and was so successful that after paying all expenses there was sufficient profit to purchase the Lindley Library for the Royal Horticultural Society and to present £1,000 to the Gardeners' Benevolent Institution.

I forward you a copy of a leaflet which is being distributed all over England by the Royal Horticultural Society. It is, as you will see, intended chiefly for cottagers and small farmers, and is meant to afford them reliable information on the best kinds of fruit for general cultivation. The list, with cultural notes, has been drawn up by forty leading experts in fruit-culture in England. It gives the names of the twelve best apples for cooking, the eight best apples for dessert, the twelve best pears, twelve best plums, and a selection of cherries, damsons, raspberries, currants, gooseberries and strawberries. The habits, time of fruiting and keeping qualities of each are given, with a few important directions on planting, pruning, manuring, etc. The aim has been to make the list applicable as far as possible to the whole of England, and to include only varieties possessing the four most necessary characteristics of quality, fertility, good growth and hardiness. The leaflet consists of eight pages, and it is to be had at the rate of 2s. 6d. per 100 copies.

Kew. *W. Watson.*

Cultural Department.

The Grape Crop.

THE grape harvest of 1891 will long be remembered for its abundance and low prices, which was, doubtless, materially diminished by the superabundance of peaches in market. Hereabout, however, the volume of the grape crop was not as large in the aggregate as in previous seasons, though the quality was quite up to the average. The vines and fruit were exceptionally free from fungal diseases, and where fungicides were seasonably applied very little rot developed at any time during the season, while mildew was not observed till late in August. This unusual healthy condition might be attributed to the judicious use of remedies during this and previous seasons were it not for the fact that vines which had never been treated heretofore carried as fine and healthy fruit and foliage as others. The true reason for this exemption from disease is, doubtless, that the season was unfavorable to the growth of fungi. To certain conditions of the season may also be due the imperfect pollination and poor setting of the fruit, which helped to diminish the crop.

The cause for this imperfect setting is not easily determined. Conditions of temperature and moisture seemed favorable, as far as we could judge, but buds started unevenly, and clusters were much smaller than usual; yet some few varieties were not affected in this way, and exceeded all past experience, notably the Lindley (Rogers' Number 9), generally a poor setter, but this season producing the largest and finest clusters I have ever grown.

A severe drought prevailed in this section all summer. With two exceptions, up to late in August our showers had merely laid the dust, and this, too, may have helped to cause imperfect setting; and yet the growth of vines was strong, yielding an abundance of well-ripened wood.

Just after the seeds had hardened and the development of the fruit took place rains came for a few days, and this sudden addition of moisture forced a growth of pulp which seemed too rapid for the growth of the skin, and the consequent bursting caused great loss. This inability of the skin to grow as fast as the pulp, or lack of strength to hold its expanding contents, is a fatal defect in many otherwise excellent varieties. Toughness of skin and a tight hold on the peduncle are two invaluable requisites for any grape. No matter how good it may be in other respects, weakness in either of these points is fatal. The critical period, when these weaknesses are apparent, varies with different kinds and varies in different seasons. This enables a variety to pass through a sudden excess of moisture at one time or season with safety, when it would fail if this moisture occurred a few days earlier or later. This seems to explain why some varieties crack badly one season and not another. Among the varieties that cracked badly this season were the following, and I add to each the percentage of loss from this cause: Moore's Early, fifty per cent.; Worden, fifteen per cent.; Duchess, forty per cent.; Brant, fifty per cent.; Canada, fifty per cent.; Cambridge, ten per cent.; Lady, twenty-five per cent.; Salem, seventy-five per cent.; Massasoit, seventy-five per cent.; Concord, twenty per cent.; Jefferson, forty per cent.; Packlington, twenty-five per cent.; and Woodruff Red, twenty-five per cent.

Notwithstanding the troubles which beset the vineyards in this section, the yield throughout the country was immense, our markets were glutted, and prices ruled lower than ever. A correspondent in southern New Jersey informs me that he shipped half a ton of fine grapes to New York, in ten-pound baskets. The returns were, "Sold for ten cents a basket." Of course he did not need the advice to "Forward no more," which accompanied the return. And yet the wise counsellors who are writing about the causes of agricultural depression are constantly advising farmers to plant vineyards and orchards. I have often wished that some of these glib writers would go into commercial fruit-growing and teach us how to get rich. A few seasons like the past would dissipate the dreams of certain and immense profits. The situation was bad enough even before the stupid action of the New York Board of Health still further depressed prices. The newspapers reported that arsenic had been used by vine-dressers to suppress phylloxera. They had heard of copper sulphate and the rot, but Paris Green and the phylloxera looked more alarming in the head-lines. Still, this was quite as accurate as the report of a city chemist who stated that the Grape rot was caused by an insect.

The hot dry weather of September brought to perfection some varieties that are usually so late as to be classed among the uncertain ones. Black Defiance, Catawba, Roger's 32, and Isabella were among them. The fruit of Isabella was finer than I have grown for years. Of the newer varieties, Empire State continues to disappoint; Moyer is no larger than Delaware, and a feeble-growing vine; Berckmans is far better every way, except in size; Green Mountain is early and good; promises to be the best early white Grape. Colerain promises to be its peer in every respect save earliness; both vines are good growers; their weak points will develop in a year or two's trial. The best of all the new varieties this season was the Brilliant, originated by T. V. Munson, of Texas. This has fruited with me for the third time, and this season developed most excellent qualities. The vine is a good grower and appears hardy, but will suffer from mildew in bad seasons unless protected by spraying. The clusters were medium to large, berries the same, and the quality excellent. It is some satisfaction to plant and care for Grapes of this class, but a great many of the new introductions only tend to discouragement. Our list of Grapes, like our list of all other fruits, is far too long, and needs weeding out and pruning down. The probationary time of many new ones on trial is about up.

What is needed to relieve this oppressed industry, so that fruit-growers can realize a profit out of their investment equal to the labor they employ, is increased consumption or diminished production or less profits to the middle-men. Notwithstanding the low wholesale prices, from which the growers are compelled to find their profits, if any, the retailers have generally exacted ten cents per pound from the consumer. This, in many cases, represents a profit of 100 per cent. clear of all expenses. It is evident that the profit in the business is in fruit-selling and not in fruit-growing.

The profits of fruit-growing are sure and certain when pursued for one's own family consumption. No family ever satisfies its natural longing for good fruit as thoroughly when the fruit comes from the market as when it is furnished by trees and vines on home grounds. And then there is the added pleasure of watching its growth and the satisfaction which comes from superior quality, with perfect ripeness and assured freshness.

Montclair, N. J. *E. Williams.*

Fruits and Topography.

THERE are a good many mysteries attendant upon the relations which plainly exist between the growth of tree-fruits and the lay of the land. My experience and observation for more than half a century, first in the Kennebec valley of Maine, subsequently in the slightly elevated marine plain of eastern Massachusetts, afterward in the Ohio and Mississippi valleys, and later among the hills of north-eastern Vermont and the valleys running northward to the St. Lawrence River, have helped me to solve some of these mysteries. But there is large room remaining for future investigations, especially as regards special exposures; the effect of winds in modifying temperature; the relation of soils and manures to the resistance of trees against cold; the action of the sun in winter; the protective effect of snow; but, more than all else, the understanding of the rivers of the air in their downward flow.

I have orchards on a level plain near to Lake Memphremagog, on the east shore, and other younger orchards planted upon my farm two miles east of the lake, not less than 200 feet above it. Still other orchards, well cared for, are planted with trees from my nurseries upon the west shore, at greater or less distances from and above the water. All of these afford opportunities for studying the effects of climate in a region where twenty-five years ago it was firmly believed by its long-time residents that Apple-culture was quite impracticable, except for the Siberian Crabs and their seedlings. This unfavorable section extends south beyond the divide between the St. Lawrence valley and the Connecticut as far as St. Johnsbury; east beyond the Connecticut across New Hampshire, and some way into Maine; west across the Green Mountains nearly to Lake Champlain, and north to the immediate shores of the St. Lawrence, where around and above Montreal to Lakes Champlain and Ontario lies a region of somewhat milder winter climate.

The almost hardy varieties are those from which we can learn the most on the question of climatic effects, and I was early made aware that the location of my first orchards was one requiring hardier trees than were demanded for the opposite (western) shore and for the hills on both sides of the lake. That on the immediate lake-shore we often escaped light frosts in spring and fall, which struck sharply higher up, was no evidence that winter's cold would not practically destroy or prevent the profitable culture of a number of tree-fruits there which did well at higher elevations. Among these test-sorts are the Red Astrachan, Tolman Sweet and Pewaukee

Apples, and the Flemish Beauty Pear. At my lake-shore farm I cannot make them thrive, but they all do much better less than two miles away across the water, and 200 feet higher on my own side of it.

The cause is not quite the same in all cases. In fact I am not quite sure that I fully know the cause why fruit-trees that fail on the east shore endure the winter on the west. It may be in the different angle which the trunks of trees on the respective slopes present to the sun at different times of the day; or it may be in the greater angle of the western shore, which slopes steeply to the lake, while the eastern is a broad plain that receives the down-pouring cold air-streams from the eastern hills and retains them, while similar air-currents on the west discharge themselves quickly upon and spread over the lake.

Fig. 88.—Pellæa Pringlei, n. sp.—See page 555.

But one thing is certain, namely, that these cold, invisible torrents of air, pouring down from the high valleys, must be taken account of in the selection of varieties, especially for a commercial orchard. The land east of Memphremagog rises in great steps, about four miles wide, each forming nearly level areas, upon which are some of the finest grain and dairy farms in New England. On the first and second of these narrow plains or benches corn is grown without difficulty; but on those higher up it is planted only for fodder and ensilage, on account of late and early frosts; though otherwise these high farms are rather the best in their yield of the small grains, potatoes and grass, and are by no means inferior for orcharding, the winter's severest cold being less than below, while the shorter spring and fall ensures better keeping quality in the fruit. It would surprise some to know that in our hills, and in northern Maine and Canada, the Oldenburgh apple is often kept far into winter; and this also throws a clear light upon the fact, often commented upon as unfavorable to the truth of what is stated by Russians in regard to their winter fruits, which, in some cases, hardly keep into winter at all in Iowa and Minnesota. But when we remember the differences caused by both latitude and elevation these discrepancies are reconciled. Seeing the differences made in the same direction within a distance of twenty miles in my own county, I am enabled easily to understand that apples from central Russia, between latitudes fifty and sixty degrees, may be all-winter keepers, while the same fruit grown in Iowa and Minnesota, between forty and fifty degrees, may show very differently.

Newport, Vt. *T. H. Hoskins.*

Notes on Chrysanthemums.

As we have had no public competition of Chrysanthemum-growers in New York for some years, the recent show in Madison Square Garden was of great interest to those who have watched the rise of this flower into favor. John Thorpe labored for some years to convince the florists that the Chrysanthemum was destined to become of great value as a market flower, but for a time he had small success. But, judging from the recent show, it would seem that nearly all the prominent market-growers of cut flowers are now large growers of Chrysanthemums, and we have been able to observe the results which have followed their development into true greenhouse plants. The approved method of cultivation now seems to be the growing of plants entirely under glass, planted out either on benches or in solid beds. This method seems to have its dangers. The flowers at the recent show were not lacking in that refinement and purity of color which is shown in flowers grown under glass, and they were of good size and form, with abundant foliage. But why should flowers, some of which were apparently as solid as a stone-cutter's mallet one day, melt off the next as rapidly as some roses. This certainly is not the best culture of the Chrysanthemum, which, when properly grown, is one of the most lasting of flowers. Before me, as I write, is a vase of flowers in fair freshness, and they were plucked a fortnight since, and have had to endure the atmosphere of a furnace-heated room. I do not mean to say that soft flowers were universal at the late exhibition here, for there were notable exceptions, but they were so frequent as to be a subject of much comment.

The cultivation of the Chrysanthemum is so well understood now, and it is such a simple matter to secure large well-formed blooms, that there is little excuse for the production of such disappointing flowers, the fault, of course, being caused by overheating and lack of air in the houses. The fact cannot be ignored that the Chrysanthemum is a hardy flower, naturally blooming at a

low temperature, and the closer it is kept to the latter condition the more satisfactory it will prove in all that makes it valuable to the general public. Few persons are interested chiefly in the size of Chrysanthemum-blooms, but all of us enjoy their decorative effect.

The certificates at a flower-show are beyond the comprehension of an ordinary mortal, and one can only ask sometimes what they mean, unless it be to show the kind-heartedness of the judges and their desire to give a helpful advertisement to the originators or owners of new flowers. One is kept busy at this season noting certificates from all quarters, and by the time he has compared notes with other observers the novelties are reduced to a very short list, and he makes a rather longer one of some of the old favorites which continue to come to the front again and again. Still, year by year, we find great gains, some jumping into favor, and some creeping slowly. Such flowers of recent years as Viviand Morel, Mrs. Alpheus Hardy, W. H. Lincoln, Ada Spaulding, Minnie Wanamaker, Mermaid, Lilian Bird, Jessica, etc., leave little to be desired either in form or coloring. Good reliable dark-colored Chrysanthemums seem to be for the future.

Elizabeth, N. J. *J. N. Gerard.*

Fertilizers for Tomatoes.

THERE has always been, among market-growers, a belief that a heavy fertilization of Tomatoes will lessen the yield, and prevalent opinions of this kind among farmers or gardeners, even when no sufficient reason can be given for them, usually turn out, upon careful investigation, to have a basis of truth; and yet, in spite of the belief above mentioned, tests which have been conducted for some years at the various agricultural experiment stations have given almost uniformly larger yields where the land was heavily manured. Of course the character of the soil may have some influence, and the character of the fertilizer may have still more; but a recent bulletin from the Cornell Station is worthy of attention, because, while the experiments recorded still show that heavy fertilization increases the crop, it is also explained that under certain circumstances the popular view of the case may be the true one. The productiveness of a Tomato-plant depends largely upon its earliness or on its ability to give the greatest number of pickings before frost. Therefore, any fertilizer which starts off the plant rapidly in its early growth and hastens the appearance of fruit is beneficial. We can conceive, however, that whenever plant-food that is immediately available is applied late in the season it will cause a vigorous growth of the plant, and thus delay production and ripening of the fruit. The same effect might follow the early application of raw and coarse stable-litter, in which the plant-food cannot be made ready for assimilation until late in the season.

In order to determine the results of a late application of fertilizer, nitrate of soda was used at the rate of ten pounds to seventeen plants at one application, on the 25th of June, a fortnight after the plants were set. On a similar number of plants the same amount of nitrate was applied at intervals of about three weeks, in applications of two and three pounds each. The results showed striking differences. The first lot of plants up to the last week of September gave a much higher yield in the number of fruits to the plant and in the average weight of the crop. After that date, however, the intermittent application of the fertilizer in the second lot was beginning to be felt; and, as frost held off unusually long, this lot, taking the season through, gave the best yield. If, however, the frost had come at a time when it usually does the popular belief would have been vindicated. The rule seems to be that a quick fertilizer, like nitrate of soda, ought not to be applied in this climate as late as the latter part of August. As this fertilizer, however, is readily dissolved in water and escapes in drainage, it is not advisable to make it in one heavy application early in the season, but it should be distributed in different applications, and extended from the time of planting until midsummer. Of course, nitrate of soda is not a complete fertilizer, and both potash and phosphoric acid, in some form, may be needed, too. All these materials are found in good farm-yard manure, and no mistake will be made when this is abundantly applied early in the season, provided it has been thoroughly disintegrated.

A Chrysanthemum Blight.—The particular disease referred to appears upon the leaves of the plant, blotching them with brown until they wither and fall away. The trouble is due to a species of Septoria, and therefore close in kin to many kinds of fungi that prey upon cultivated plants, producing the so-called leaf-spot diseases. This Septoria is propagated from plant to plant by means of long slender spores that are produced in large numbers in pear-shaped bodies imbedded in the surface of the affected portions of the leaf. The diseased spot itself enlarges by means of the threads of the fungus already in the leaf, spreading out laterally into the surrounding healthy tissue. Moisture favors the development of these spots very greatly. Some varieties seem to be more subject to the blight than others, but probably all will take it when conditions are most favorable and the spores or germs of the fungus are present. There is no reason to doubt that spraying the young plants with the standard compounds of copper would do much to check this disease, and thus save the foliage. It is very important to spray when the plants are small, and not delay until the blight is present. No remedy can restore a blighted leaf to a healthy condition.

Rutgers College. *Byron D. Halsted.*

The Vegetable Garden.—Many of these are now covered with a dense growth of weeds that have ripened seed, which, if left, will fill the soil and give trouble for years. A large part of this can be destroyed by burning if the garden is covered with a thick coat of straw and fired when a good breeze is blowing. Straw makes a very hot fire, and even much of the seed which has fallen on the ground can be destroyed in this way. It is a great advantage also to plow the garden in the fall, and if plowed deep the weed-seed still left will be turned down so deeply as to give much less trouble than it would if near the surface. Besides, if the garden is plowed in narrow lands and the dead furrows opened so as to carry off the water, it will dry off so as to admit of being planted much earlier in spring than if left unplowed, and it will also be in much better condition.—*W. F. Brown, in The Tribune.*

Correspondence.

In the Shore Towns of Massachusetts.—III.

To the Editor of Garden and Forest:

Sir,—Marblehead has Crocker Park, a headland on the harbor, given to the town by Hon. Uriah Crocker—a fine view, rocks, no trees, very steep in places, and not safe in its present undefended condition. Railings are needed at the top of the ledges. There is another headland, or portion of a hill-top and slope, which was given to the town by Hon. J. J. H. Gregory. This also affords a good view of the water. The Old Burying Hill has few interments of late years. The title is in the town, and it is much used as a place of public resort. The site of the fort on the shore, occupied during the civil war, has been improved and cared for by the Town Improvement Association with the understanding that it was a public possession, but the owners of the adjacent land have recently built a fence across the area which had been used by the public, enclosing about half of it, and greatly impairing the value of the remainder for public use.

I spent a memorable day with Messrs. Chase, Eliot and Wigglesworth in the Lynn Woods. This tract of 1,600 acres of land and water is a possession of extraordinary importance. No other of the smaller cities of our country has anything to compare with it in extent. It is a region of unspoiled woodland, and it will so remain, as it is not intended that it shall ever be made a park in the ordinary sense of that word. There is an admirable system of roads, which will be extended, and there will be need of shelters at various points. There will be as little artificial construction as possible, no decorative gardening, no perceptible interference with the wild sylvan beauty, which is the essential charm of this great public resort. Its proper official and distinctive name is The Lynn Woods.

The two wolf-pits are objects of great historic value. I have not been able to learn of the existence of any similar remains anywhere in this country. They are perhaps eight or ten feet deep, but have been partly filled up by leaves drifting in. I thought them about eight or nine feet long and three or four feet wide. A recent newspaper article described them as circular, with walls narrowing at the top. I suppose the writer thought wolf-pits ought to have that form. But those I saw are parallelograms with vertical walls, their corners right angles, and, in short, with nothing circular about them. The smooth stone walls were so well laid that they are still not perceptibly out of plumb. These pits should be very carefully protected and preserved that they may never become mere restorations.

Quincy has Merrymount Park, seventy-five acres on the shore, woodland and ponds, given to the city by Hon. Charles

Francis Adams in 1885. It has not been improved very much, as one of the conditions of the gift was that the city should not expend more than $1,000 a year on the park for the first ten years. After this term expires more will be done for its improvement. Faxon Park, about twenty-six acres of woodland, in the region formerly called the South Common, not on the shore, was given to the city by Hon. Henry H. Faxon in 1885. It is not improved much. Before 1885 Quincy had no park or common. The people went to the beaches, and do now, but there are no public holdings on the shore outside of Merrymount Park. The city was incorporated in 1888, and has now 17,000 people. The Village Improvement Society has recently put up a fine granite fountain, costing about $6,000, on land belonging to the Street Department, formerly a part of the old Training-field.

Weymouth is fortunate in the possession of Webb Park, which has recently been presented to the inhabitants of the town by Mrs. Margaret T. W. Merrill, of Portland, and Mrs. Nancy B. Jackson, of Boston. The donors are descendants of the late Christopher Webb, a prominent lawyer of Weymouth, who represented the town in the General Court for thirty years or more. This park-land was formerly a part of the estate of Major John White, who owned a large farm here a hundred years ago. Christopher Webb married his daughter, Miss Susan White, and this is a portion of her inheritance from her father's estate. Its area is eight acres. It lies high, overlooking all the Weymouth Fore River country and the numerous islands off shore. In the deed of gift the donors say the land is given to the town "in consideration of our regard for our birthplace and as a memorial of our honored parents." It was an act of far-sighted beneficence, an admirable and enduring example to the people of other Massachusetts towns.

There is a small common at Hingham Centre, perhaps two or three acres. Fountain Square, near Hingham Station, is little more than a slight expansion of the streets which cross each other diagonally there. There are five large Elms here, planted about seventy years ago. There are no other public holdings. The town formerly owned a considerable area along the town brook, but sold it at low rates long ago. Much of this land is now built upon, and the town has repurchased some of it in later times, paying a good price. Melville's Garden, at Downer's Landing, a noted resort on the shore, had 275,000 visitors during the season of 1891. It is a private holding, with restaurant, etc., and brings a great revenue to its proprietor. Such resorts are sure to be multiplied in the shore towns, and to attract an increasing number of visitors from the cities and from the interior of the country. In Hingham I saw the Old Place which has been made historic by the story of its renewal, which Mrs. Robbins has told with such extraordinary vivaciousness and interest in GARDEN AND FOREST. The Agricultural Society has large grounds at Hingham, but they are not used as a place of public resort. The town ought to have a park or reservation on the shore. There are many things of historic interest here, and there should be an increase of popular interest and knowledge regarding them.

There are no public holdings in the town of Hull. The great beach at Nantasket is all private property. Some of the hill-tops and great reaches of shore lands should belong to the town, or to the state, for the use of the myriads of people from the cities who throng the island every summer.

Cohasset has one of the prettiest commons I have seen in any village: about four acres, fine trees and grass, enclosed with a fence of posts with two chains. A church, built in 1743, stands within, about the middle of one side. There is an enchanting view of the water and meadow shores. The common is obviously incomplete at this end, and I was told that the town owns an area outside at that point, and that a man living near had obtained permission to enclose a part of this valuable public holding for his own private use. Even if this were included the common would be small for the public need. By permitting such occupancy several of the shore towns have lost title to land which would now be an important public possession. There is a comparatively roomy playground around the new Osgood school, and the building has more architectural character and beauty than I have seen anywhere else in a schoolhouse.

The name Scituate appears to be a corruption of an Indian word, Sa-tu-it, accented on the second syllable, and said to mean brook, or cold brook. It is still in use. I think the meaning of Indian names is mostly uncertain and a matter of guess-work now, and the sound is more important, when it is pleasant or musical. We still have Cotuit, and some other names very similar in sound. The town had formerly extensive holdings on the beach. Deane's History says: "The beaches from the third cliff eastward to the river's mouth have been defended from waste by repeated acts of the town, forbidding the removing of stones, &c. Two landings at the harbor have been preserved by the town, and frequently surveyed for the purpose of keeping their bounds. These came into the town's possession in 1704, when the Conihassett Partners surrendered their highways, etc., to the town." These important shore lands have mostly been forcibly taken possession of and appropriated to their own use by some of the owners of contiguous grounds. The town has been the theatre of one of the great beach controversies of the country. It has vainly expended thousands of dollars in the effort to defend its rights on the shore. The people have grown weary of the unavailing struggle, and although the courts have not rendered a full decision on the merits of the case, it is not likely that the town will make any further effort to obtain redress. The men who have seized the public property say to the people of the town, "Come on this beach if you dare!" and if any citizen drives his team on the shore in the exercise of the ancient right to collect seaweed or drift-stuff they meet him with weapons and violence, attack his horses with pitchforks, and are thus able to "hold the fort" against all efforts to maintain the public right to the beach.

In early times the town had a large Training-field. A long time ago a man sat down on it and stayed there, and the town could not get him off, or it did not, and some of his family are living there now. A fragment of the old Training-field still remains unappropriated to private use, and now forms a small common.

The records say that when this region was first settled by white men the shores of the bays here were skirted with forest-trees quite to the water's edge, and some of the earliest entries mention the Live Oak forests in the vicinity of Coleman's Hills. What tree was this? Walnut-tree Hill was so named because the Black Walnut was indigenous there. It was a wild region of woods and waters. There were many beaver-dams, and for nearly a hundred years the town voted every year a bounty for the destruction of wolves. There is still a Town Swamp on the maps here, but the last of this public holding was assigned to various citizens long ago. I copied from the Town Records of 1706 the statement that eighty lots of Cedar-swamp were conveyed to individuals by a committee appointed by the town in February of that year.

At Hobart's Landing, on North River, in Scituate, ships were built as early as 1650. Here the ship Columbia (Captain Kendrick) was built by James Briggs in 1773. This was the first ship to visit the north-west coast from this country. Captain Kendrick explored the River Oregon and named it after his ship, the Columbia. Many of the whale-ships employed by the people of New Bedford and Nantucket during the latter half of the last century and the early part of this were built in Scituate. They generally rated from 300 to 350 tons. The largest of which I find any record was built in 1812 by William Delano, nearly 500 tons.

In 1830 Captain Samuel Barker received a premium from the Plymouth Agricultural Society for the best crop of rye in the country, and two other citizens had premiums the same year for general improvement of their farms. The year before Colonel James Curtis had received a donation for general improvement of his farm, and Thatcher Tilden a premium for the best crop of rye. I think that agriculture in Scituate has rather declined than advanced since then. An old cemetery here has been much neglected and abused. A public highway has been run through it, destroying many of the graves and head-stones. The sites of some of the smaller burying-places mentioned in early histories of the town are probably indistinguishable now. I hope soon to learn whether this is so or not.

Queen Ann's Corner has its name from Ann Whiton, who kept a tavern there in 1730 and many years afterward, where the Plymouth road crosses the town line to Hingham. I copied the earliest marriage notice preserved in the Town Records, "Resolved White, to Judith, daughter of Mr. William Vassall, November 25th, 1640." Resolved White came to Plymouth in the Mayflower with the first company of pilgrims in 1620, and had lands laid out to him in Scituate in 1638.

In Scituate I saw the birthplace of Samuel Woodworth, the author of the poem "The Old Oaken Bucket." He was born here January 13th, 1785. He early chose to be a printer, and was apprenticed to Benjamin Russell, editor of the *Columbian Centinel*, in Boston. He became a busy journalist and prolific author. He went to New York City in 1809, and in 1823 was associated with George P. Morris in establishing the *Mirror*. The Old Oaken Bucket poem was written in the spring or summer of 1817. Mr. Woodworth was then living in Duane Street. He came home to dinner from his office, near the foot

of Wall Street, on a warm day and took a drink of water, saying that he would rather have a drink from the old well at home. His wife said, "Selim, that's a pretty subject for a poem," and he wrote it. I have read an autograph letter written by him in August, 1835, in which he says that his second son, twenty years of age, was at that time on a three-years voyage to the Pacific Ocean as captain's clerk to Captain Morrell, who discovered the Cannibal Islands. Mr. Woodworth died December 9th, 1842, and was buried in New York, but his body was afterward removed to San Francisco. I wish to learn where it now lies, and whether there is any monument over his dust. I think the birthplace should be marked in some appropriate way, and should like to communicate with some of his descendants, in order to consult them regarding the matter. The well and the little old mill appear to be the same as when the poet saw them daily in his boyhood. I think we ought to preserve the well, and perhaps the millstones, which are still in use. The birthplace is visited by an increasing number of the summer dwellers on that part of the shore, sometimes as many as sixty in a day. The interest which attracts people to a poet's birthplace is wholesome and should be encouraged, but it cannot always be convenient in its results for the courteous family now having the care of the celebrated well. Pleasant attention is given to all visitors, and fees, frequently offered, are always refused. *J. B. Harrison.*

Boston, Mass.

The White River Forest Reservation.

To the Editor of Garden and Forest:

Sir,—Colorado has the honor of possessing the first forest-reservation under the act of Congress passed at the last session. This is "The White River Forest Reservation," for which a proclamation was issued by the President on October 17, 1891. I have carefully examined the whole tract, and a general description of it would, no doubt, be of interest to the readers of Garden and Forest.

This reservation lies in the western part of the state, and comprises the eastern portions of the counties of Garfield and Rio Blanco. It is just over the crest of the Continental Divide, where the rivers run almost due west, and where the greater rainfall produces a larger forest-growth than on the eastern side. The tract is rectangular, extending about fifty miles north and south and forty miles east and west, beginning about seven miles north of Glenwood and ten miles east of Meeker. It therefore has an area of about 2,000 square miles, or about 1,350,000 acres. Three rivers receive a large portion of their water here. In the southern part its slopes drain into the Grand River, which flows past its border. In the centre, near its eastern boundary, rise the White River and the many small streams which form its head-waters. In the northern portion rises the Williams River, the main tributary of the Yampa, which, like the White River, empties into the Green River near the Utah line.

The reservation is made to cover what is known as the White River Plateau, which, although broken with hill and valley, and nowhere strictly level, is crossed by no mountain ranges, and has a general level character, varying in altitude from 8,000 to 11,000 feet, with here and there ragged peaks rising as high as 12,000 feet. The formation is volcanic, and the immense forces which threw up these bold cliffs and great rocks are visible everywhere, forming a peculiarly grand and sublime scenery.

About two-thirds of the surface is covered with a dense forest, in some places almost impenetrable, consisting of one deciduous and three coniferous species. Each species has its own habitat or level, and seldom encroaches upon that of the other. The first tree we meet is the Aspen, at an altitude of about 8,000 feet. Above this comes the Red or Douglas Spruce (*Pseudotsuga taxifolia*) at an altitude of 8,000 to 9,000 feet, and from this to the timber-line, 9,000 to 11,000 feet, is the White or Engelmann Spruce (*Picea Engelmanni*). With the Engelmann Spruce, at an altitude of 9,000 to 10,000 feet, is mingled in large numbers the Balsam Fir (*Abies lasciocarpa*). But this tree is of little value commercially, so that the forests of this reservation may be said to consist of Red and White Spruce. Grand trees they are, rising slim and straight like a column of verdure to a great height, their trunks perfect, without a bend, and as straight as ship-masts. Many have reached their maturity, and are toppling to their fall. The forest-floor is covered with dead trunks in all stages of decay, among which, and fed by them, are young trees of every age. The Red Spruce is the more valuable timber-tree, and being easily reached on the lower slopes is cut to a considerable extent. The White Spruce forests are so inaccessible as to be of little commercial value, at least for many years to come. At present the main object for the reservation is to conserve the water for irrigation in the valleys below.

The soil is in many places boggy, and the whole country is full of springs and little rivulets. Wherever the nature of the ground will allow, lakes are formed of all sizes, from fifty feet to three miles across. On the highest portion of the plateau, where the surface is less broken and opportunities are given for the water to accumulate, the little lakes are innumerable, and one may ride for hours among them. This reservation will be the means of storing an immense quantity of water, which will be of incalculable value to the wide valleys in western Colorado and Utah, through which flow the three rivers which largely receive their supply from this region. In the winter the accumulation of snow is immense, lying in many places twenty feet deep, and never less than six feet, and not disappearing until July. The beneficial effects of the forest upon this mass of snow is evident to any student of its influences.

The reservation contains magnificent scenery, which in its way surpasses that of any other region. From the highest peak, Mt. Marvine, a little over 12,000 feet in altitude, a most extensive view can be obtained, which will repay the adventurous climber. At his feet is spread the whole of the reservation. He can note the nature and extent of the forest, and the open parks and valleys. He can follow the course of the large streams and rivers, until they lose themselves in the distance. He can point out the peaks of the reservation, and beyond them the higher ranges, white with snow, which bound the horizon as far as the eye can reach. Few more attractive places than this reservation can be found for the tourist, and a trip through this region is well worth any trouble. It must be done on horseback, with guides and a camping outfit. Glenwood Springs, a well-known watering-place on the Denver and Rio Grande Railroad, is the best place to start from.

Game abounds in this region. The lakes and streams are full of trout; and elk and deer, bear and mountain lion roam the woods. But the large animals are becoming scarce, and some method of game preservation must be adopted at once to prevent the total destruction of the deer and elk.

Perhaps in no state or territory are the forest-reservations more important than in Colorado. For, besides preserving the timber, they prevent the diminution of the waters for irrigation, without which the agricultural and fruit-growing industries, now fast becoming most important, would languish and fail. Several other reservations have already been asked, and still others are in contemplation. After long waiting it seems that we have now the opportunity to protect our streams, and it is intended to push the movement now begun until the head-waters of all Colorado rivers are reserved.

Colorado Springs. *George H. Parsons.*

The Specific Name of the Texan Cercis.

To the Editor of Garden and Forest:

Sir,—I have read with some surprise in Professor Sargent's "Notes" upon the synonymy of the Texan Red Bud (page 448, *supra*) that he proposes to call it *Cercis Texensis;* for I thought I was quite familiar with the fact that it had been duly published by Dr. Gray in the "Plantæ Lindheimerianæ," as long ago as 1850, under the name *C. reniformis*, taken up from Dr. Engelmann's manuscript. Only a glance at the place thus referred to is needed to show that my impression was correct. It was altogether erroneous to have stated, as was done in the "Botany of California," that up to 1876 *C. reniformis* had remained a manuscript name. The supposition of Professor Sargent appears to be that, since Dr. Gray did not himself recognize in this shrub of the south-west anything beyond a mere form of *C. occidentalis*, he could not, or did not, give due publication to the name *C. reniformis*, though what logical or historical reason he may have for the supposition I cannot imagine. While Dr. Gray did not adopt Dr. Engelmann's opinion, he, nevertheless, conceived it to be an opinion worth publishing, and published it, at the same time appending the name by which it was intended the species should be known in case specific rank should at some future day be generally conceded to it. It is certain that Dr. Gray had no other purpose in then printing the name *C. reniformis*, along with the means of identifying it, but this, that his esteemed collaborator's proposed name should forever designate the species in case it should be accounted a species. He did it in order to preclude all possibility of Dr. Engelmann's losing his right to the name. It was, in his intent, an effectual preventive of any possible future *C. Texensis*, for example. This provisional

publication of another's species, under just such protest, but with the certain effect of securing to the species its earliest proposed name in case of its acceptance as a species, was done over and over again by Dr. Gray, as by many another eminent botanist. I have never before heard the tenability of such a name called in question, and I am sure the verdict of botanists would be that, as an indubitably valid name for the Texan Red Bud, *C. reniformis* antedates *C. Texensis* by forty-one years.

University of California. *Edward L. Greene.*

[The point made by our correspondent relates to one of those questions of nomenclature about which different authors have maintained different views. The name *Cercis reniformis* is not Engelmann's, for he never published it. It is not Gray's name, for Gray did not adopt it, although he referred to it in the work cited by Professor Greene. Brewer & Watson mentioned it in "The Flora of California" (1876) with a short descriptive phrase, so that they must be considered the real authors of *Cercis reniformis*, whether that name is retained or is considered a synonym.—Ed.]

The Acorn Crop.

To the Editor of Garden and Forest:

Sir,—Referring to the failure of the acorn crop in Minnesota, as recorded in a note in your issue of October 21st, I would say that in this section acorns are very abundant. The Bur Oaks, of which there are numerous cultivated trees here, are unusually full. So also are the White Oaks, Swamp White Oaks, Rock Chestnut Oaks, Black Oaks, Scarlet Oaks, Red Oaks, Pin Oaks, Spanish Oaks, Post Oaks, Black Jack and Willow Oaks, all of which are here in their wild state. That there are no acorns on the Minneapolis Bur Oaks is the reverse of what I should expect. I have occasion to be interested in the acorn crop every year, and think I can safely say that, as a rule, a failure in one part of the northern states means a failure in all parts of them. That is, if the Scarlet Oaks of a given locality fail to yield acorns it is almost useless to look elsewhere for them, and the same is true of all other kinds. But this rule does not hold good in the southern states. To my knowledge, for perhaps twenty-five years past, demands there for acorns of *Quercus Catesbæi* and *Q. aquatica*, made yearly, have always been met. Referring again to the Bur Oak, the large specimen in Bartram Park here is unusually full of fruit this season, but a tree of *Q. lyrata*, which is near it, has hardly an acorn on it.

Germantown, Pa. *Joseph Meehan.*

Periodical Literature.

As represented on a detailed map of any important county in any of our states, says Mr. Isaac B. Potter in the November *Forum*, our country roads show an enormous extension, and "three of our states can be easily selected in which the total length of public roads, exclusive of town and city streets, is greater than the combined mileage of all the railroads in the world." Mr. Potter is the secretary of the New York State Roads Improvement Association, and his article, called "The Profit of Good Country Roads," is therefore entitled to earnest attention. How does he describe the condition of the public ways in question, after noting the immense sums which, in deference to the demands of capital—for the profit of individuals and corporations more immediately than for the profit of the people at large—the nation has spent in the establishment of commercial centres, in the development of railroads, in the improvement of river-ways and harbors, and the extension of telegraphic lines? "With the enlargement of concentric circles surrounding every American inland town," he says, "is to be found an apparently undue diminution of agricultural population, wealth and thrift." And this is because "the dirt-road, that only avenue of communication which connects the farmer socially and commercially with the world at large . . . is the same road that was used a hundred centuries ago by the naked savage when chased by a storm to the sheltering cave, and from him seems to have descended as an entailed legacy to the American government. In all these years it has not changed, except that the modern article is more or less churned and mangled by narrow wheel-tires and flanked by costly and useless fences—two species of property unknown to our primitive ancestor and first conceived at that later period which marked the dividing-line between instinct and imbecility. Measuring a million miles or more in its various ramifications, dissolving in the rains of April, baking and pulverizing beneath the rays of the midsummer sun, drifting and disappearing in the whirlwinds of November, and presenting at all times but little more than a roughened streak of soil to serve as a land highway for the great volume of internal traffic the time seems to have come when the American common road may rightfully assert itself as the most expensive and by all odds the most extravagantly maintained of all the public institutions. To the intelligent foreigner who comes to our shores the American 'system' of road maintenance is little short of ridiculous; to the thoughtful and inquiring native it is only a kind of legalized negligence, a relic of feudalism borrowed from England in the old days of governmental poverty and placed in the keeping of the most patient and long-suffering of our industrial classes, who have gradually been led by 'the ensnaring wiles of custom' to endure and embrace it." Then the author declares, and all sensible men will agree with him, that an understanding of the pecuniary benefits of good roads "is a national question; for these roads are the common care and property of all the nation, and any effect which grows out of their improvement must be found directly in the economic condition of the persons and property within their widened influence."

We cannot follow Mr. Potter through the explanation he then gives of the condition of American farms, illustrated by many facts and figures, showing how vastly the number of small holdings has decreased in the west during the past ten years while the extent of very large ones has correspondingly increased, and calculating the future need for good common roads by estimates of the rate at which the agricultural productiveness of many regions may be expected to augment during the immediate future. We can merely recommend his article to all good citizens as the most scientific exposition of the matter which has yet come under our eyes, and, therefore, of course, the most convincing. He then quotes the experience of foreign countries to show the value and ultimate economy of good systems of road-management, and likewise of a few American counties where experiments in this direction have been made. He cites, for instance, the testimony of a resident of Union County, New Jersey, where forty miles of telford and macadam road have been built at a cost of $10,000 per mile, which declares "that the property in Union County has actually appreciated in value far more than the cost of the roads, and this not only in cases of sale or exchange but upon the tax-levy. Notwithstanding the fact that $300,000 worth of county bonds have been issued to build these roads, and the interest must be met annually, the tax-rate has not been increased in the county, or in any city in the county, in consequence of the extra interest-expense; and it is but fair to say that the actual appreciation of property due to the increased value of lands benefited by the improved roads meets the increased taxes already. And none of our roads have been completed for more than a year, and some parts of them only within the present month. As an advertising medium alone they have been worth what they cost. . . . It is safe to say that the citizens and taxpayers of Union County would not go permanently back to the old system, with its old roads, if they were paid many times the cost of the new roads."

The agitations in favor of new roads recently begun in several states are then mentioned by Mr. Potter, and a deserved tribute is paid to the services of the "League of American Wheelmen," whose 25,000 members have done a vast amount of careful, conscientious, systematic work in the way of collecting statistics, printing and circulating information, and studying the best methods for improving the present state of things—work which has, of course, been largely inspired by a sense of their own personal interests and yet has been carried on in a truly public-spirited way, and will unquestionably conduce very greatly to the benefit of the people as a whole. In conclusion Mr. Potter says that he believes "the signs are hopeful, and the future of the American road is full of promise." Work for its improvement is already "well in hand," and he is cheered by the thought that soon "the government and the states will be brought to adopt that beneficent principle of statecraft which leads a nation rightly and fully to exercise its paternal functions and to direct the public hand to the aid and development of that great branch of industry which was born with the birth of the nation itself and upon the success of which all national wealth must eventually depend."

Notes.

A chute in the logging camp at Clifton, Oregon, is described as one of the longest in the world, measuring three-quarters of a mile. Its bottom is shod with railroad iron, and, on account of its smoothness and the steepness of the descent, logs traverse it in the space of twenty seconds.

Hungarian vineyards have been terribly devastated of late by the phylloxera, the celebrated establishments at Hegyalya, the headquarters for the production of Tokay wine, having been almost wholly destroyed, many other districts being in as bad a case, and the pest having spread through 1,500 parishes.

The Grand Falls of Labrador were recently rediscovered by an expedition of students from Bowdoin College, and prove to be one of the greatest natural wonders of the world. The precipice is 316 feet in height, and the rapids above the fall make the entire descent about 500 feet. The river is a powerful stream 200 feet wide.

The Canna, Star of '91, which was shown in abundance at the late flower-show in Madison Square Garden, proved to every one that it is to be classed among the very best of these dwarf varieties along with Madame Crozy. Some growers claim that Madame Crozy is best for outdoor work, but we could hardly dispense with either one of these constantly blooming plants.

A correspondent of the *Country Gentleman* states that the Locust-tree was brought to this section from Virginia by Captain John Sands, of Sands' Point, Long Island, about 1700. During the last twenty years the demand for locust-timber has been so heavy as to cause almost an extermination of the trees. With the small supply and increasing demand, Locust-saplings are sure to prove a good investment.

The first-prize seedling Chrysanthemum of this year at the Chicago exhibition was shown by Frank Leslie and named Mrs. A. C. Allerton; it is a distinct coppery yellow, incurved flower of large size. Mr. J. C. Vaughan received certificates for the King's Daughter, a large flower with petals of snowy white, and for Golden Gate, a large double reflexed chrome-yellow flower. Messrs. Pitcher & Manda also received a certificate for a yellow flower of the Mrs. Hardy type, and named W. A. Manda.

Among the successful Chrysanthemum exhibitions of the season the one held at Buffalo last week is worthy of mention. The correspondents speak in praise of seedlings raised by John F. Cowell, of that city, as very meritorious, one of them being a hybrid between Louis Bœhmer and Lilian Bird, in which the petals, although tubular, are strongly incurved. William Scott's collections of Carnations were praised, and an unnamed variety called No. 24, white with a fringed edge, strongly scented and numerous long petals, is spoken of as an excellent flower, as is No. 30, a pink, somewhat darker than Grace Wilder.

The annual Chrysanthemum-show at Indianapolis has usually brought out many promising seedlings, and this year there were a large number certificated, several of which have already been described in our columns, as, for example, Pitcher & Manda's Harry May, and E. G. Hill & Co.'s O. P. Bassett, Maud Dean, Edward Hatch, Mrs. Lewis Childs, Madeira and Mrs. Robert Craig. Henry Rieman won the prize for the best Pink with Olga, a fine well-built flower, full and double to the centre, on a strong stiff stem. Nathan Smith & Son showed the best yellow in Miles A. Wheeler, and the same growers won the premium for the best white flower with Mrs. Governor Fifer, a flower of informal shape, with broad petals and fine contour.

It is very plain that English growers have not found out how to treat the Chrysanthemum Mrs. Alpheus Hardy, as there is general complaint about it in the horticultural journals across the water. It is stated in *The Garden* that in the great national Chrysanthemum-show there were not more than half a dozen blooms of this variety in the whole exhibition, and only one of these could be called up to exhibition form. It is a misfortune that some of these English gardeners could not have seen the vase of cut blooms of this variety shown at the New York exhibition by Peter Henderson & Co. So far from not fulfilling the early promise of the flower, they were better this year than ever before. The blooms were absolutely perfect, although the stems were too feeble to hold them up as they should.

A few years ago the beautiful little Ram's-head Lady's-slipper was discovered in the Chinese province of Yun Nan by Abbé Delavay, and this was another illustration of the close relation between the flora of eastern North America and that of China and Japan. Orchids, however, are not widely distributed, and this fact was considered most interesting. We are now informed in a note in the *Gardeners' Chronicle* by our correspondent, Mr. R. A. Rolfe, that a collector on the Tibetan frontier, Mr. A. E. Pratt, has sent some fine specimens to Kew of *C. spectabile*, which is probably the most beautiful plant of the genus and one of the most charming of our North American hardy flowers. We shall, therefore, be able to speak no longer of this showy Lady's-slipper as an exclusively American flower.

Everybody admires the bold masses of white flowers in the autumn on well-grown plants of *Pyrethrum uliginosum*. In many places abroad it is used at the back of a mixed border with Dahlias and early-blooming Chrysanthemums in front. Some people, however, think that the size of this plant detracts from its decorative value, and they will be glad to receive the suggestion which Mr. R. Dean makes in the *Gardeners' Magazine*, London, that branches of this plant can be layered just before the buds are formed, when they root readily and make neat little plants, six or eight inches high, which will be covered with bloom. It is an easy matter to layer the plants in this way, as they root readily, and the dwarf plants which are thus produced will be found very useful for decorating cold greenhouses or as window-plants at this season.

Some years ago Mr. Heinrich Schmidt, of Erfurt, found in a neglected nursery-garden a wild Cherry-tree, which he cultivated, and which finally became a well-grown tree of good appearance, and with the remarkable peculiarity of bearing ripe fruit in September and October. Mr. J. C. Schmidt, who is now the proprietor of the same establishment, writes to the *Gardeners' Chronicle* to invite attention to this remarkable tree, which does not begin to ripen fruit until all other cherries are gone. The first ripe fruits are seen in early September, and up to the middle of October there appear ripe, half-ripe and unripe fruits on the tree at the same time. The fruit is said to be of a dark red color, of good size, with a fine acid, vinous flavor. Mr. Schmidt's letter was accompanied by a wood-cut taken from a photograph executed on September the 12th, in which the ripening fruit appeared. The firm has called the variety Hochgenuss von Erfurt, Great Satisfaction from Erfurt.

The King of the Belgians is well known for his devotion to horticulture and landscape-gardening. For ten years His Majesty has been designing and superintending alterations in the palace and grounds of Ciergnon Castle, which has been erected on the site of a small hunting-lodge used by the late Leopold I., where there is a large and well-stocked conservatory in which an electric-light can be made to glitter at the base of every plant by simply pressing a button. The engine which furnishes the electricity for the light also pumps water to a large reservoir which is used for watering the plantation in the park, and the tank is planned so as to be ornamental as well as useful. The ground about it is arranged in a natural manner, and little brooks and cascades have been made to course through them under raised bridges and through gorges which open vistas into the adjoining country. The grounds are near the woods of the Ardennes, and they extend for a distance of three leagues on a gentle declivity from the chief entrance for some distance, and then rise sharply to a Pine-clad ridge.

Professor Trelease, of the Missouri Botanical Garden, has issued his third announcement concerning garden-pupils. It will be remembered that two years ago six scholarships were established, which were to be awarded by the director on competitive examination to young men under certain conditions provided by the trustees. One candidate for these scholarships was to be named by the Horticultural Society of Missouri, and another by the Florists' Club of St. Louis, and of the three scholarships to be awarded by the director of the garden before the 1st of next April one is now reserved for the nomination of the Florists' Club of St. Louis. Applications for scholarships must be in the hands of the director before the first day of March next, and the examination will be held on March 8th at the Shaw School of Botany. We have before spoken of the thorough nature of the course presented by this institution, which aims to give thorough instruction in vegetable-gardening, small-fruit culture, orchard-culture, forestry, botany, landscape-gardening, vegetable physiology, economical entomology, etc. It is especially desired that the candidates for scholarship should not be much over fourteen years old, and they will receive all needed information together with the necessary blanks, if they will address Professor William Trelease, Director of the Missouri Botanical Garden, St. Louis. The course of instruction is not planned to be a mere repetition of the courses now offered by the numerous state colleges of the country, but it is quite distinct and held strictly to what will be considered necessary for the training of practical gardeners. There certainly is room for an institution of this sort in the United States, and it is to be hoped that many bright young men will avail themselves of the singular advantages which are here offered.

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The Manzanita.

EVERY one at all familiar with the flora of the eastern states knows the Bearberry, a delicate plant which often covers rocky and sandy soil with a dense carpet of long prostrate stems clothed with small, thick, dark green evergreen foliage, and which in early spring covers itself with clusters of handsome flesh-colored flowers, in general form not unlike those of the Blueberries. These are followed in the autumn by red fruit which resembles that of the Cranberry, although it is smaller, less brilliantly colored, and of insipid flavor. This plant is the type of the genus Arctostaphylos, and botanists call it *Arctostaphylos Uva-ursi*. It grows in America from the mountains of Pennsylvania to the Arctic Circle, in the Rocky Mountains, on the Pacific side of the continent as far south as northern California, and in the mountains and boreal regions of Europe and Asia. There is another species of Bearberry which occurs on the alpine summits of the New England mountains and in British America. This second species is also circumpolar in its distribution, so that eastern America possesses no endemic representative of the genus, which, although our two species are beautiful plants, makes no great display here, and does not form a conspicuous type of our vegetation. West of the summit of the Sierra Nevada, the Bearberries, or Manzanitas, as they are always called in California, are so abundant, both in species and in the number of individual plants, that they are a feature of California vegetation, often beautiful in itself, and quite unlike anything seen in other parts of the country.

There are ten or eleven species of Manzanitas found in California; some are small and some are tall wide-branched shrubs; and one species, at least, under favorable conditions, attains the size and habit of a small tree. This is the plant to which the late Dr. Parry, who studied the Manzanitas for many years, and knew them better than any one else, gave the name of *Arctostaphylos Manzanita*. Like most of the species, and like their near relatives, the Madronas, the bark of this plant is smooth and bright red even on the small branches. One of the peculiarities of all the species is that the bark is renewed every year; in May or June, when the annual growth begins and the branches swell, the outer layer of the bark formed the previous year breaks into large loose flakes, which gradually fall and display the pale green new bark, which on exposure to the light soon turns red. It is the smooth red trunk and branches which make the California Manzanitas such peculiar and striking objects, and which excite the astonishment of travelers from other parts of the world. The leaves are ample, obtuse, bright green, and, like those of many of the species, appear vertical on the branches by the twisting of the stalks, a provision of nature by which many shrubs in dry arid regions are saved from unnecessary evaporation. *Arctostaphylos Manzanita* is one of the earliest of the family to flower, and it is not unusual to see it covered with its clusters of white bell-shaped blossoms at Christmas-time, although at high elevations the flowers do not appear before the month of May. It is a widely distributed plant, and there is still much to learn of its distribution and of that of several of the other species; but it is known to be abundant along the foot-hills of the Coast ranges north of the Bay of San Francisco and in the valley of the Sacramento, extending up the western slope and probably across the Sierra Nevada. At high elevations it is a low shrub; on the dry barren slopes of the foot-hills it is a tall, wide-branching, usually rather sprawling, shrub, but in favorable situations, where the soil is rich and water is near at hand, it occasionally attains the size and habit of a small tree. Such a specimen is represented in our illustration on page 571. It is believed to be one of the largest, if not the largest, Manzanita in existence. This wonderful plant is thirty-five feet high, and the branches spread out in one direction to a diameter of thirty feet, and in the other to thirty-six feet; but the thickness of the short trunk is more remarkable even than the spread of the crown. At the ground it girths eleven and a half feet. This size is maintained up to the division, which takes place two and a half feet above the surface of the soil, while the two principal branches at their point of separation each girt a little more than seven feet. This tree is growing on the estate of Tiburcio Parrott, Esq., in St. Helena, Napa County, to whom we are indebted for the use of the negative from which our illustration has been made. It stands near a spring in deep rich loam, and close by may be seen other specimens with stout trunks, several of which girt at least six or seven feet.

A happy chance has preserved this giant of its race which represents, no doubt, the growth of centuries, for the Manzanitas are usually slow-growing plants. The great scar of the wound made by an axe on its trunk shows how near it once came to death. Years ago a wood-chopper in the employ of the Napa Valley Wood Company had begun to cut it for fuel; a man passing by purchased its life by the payment of two dollars, and so saved a plant which is, in its way, as interesting as any of the great trees of California, and in doing so earned the gratitude of every lover of trees not only in California but in all the civilized world. It was Dr. C. M. Hitchcock who did this good deed. If he is still alive he has perhaps forgotten all about the great Manzanita and the two dollars which he gave to ransom its life. But his connection with it must not be forgotten, and we should like to see placed on the tree a tablet which should recite its history. The preservation of such trees is a matter of public congratulation, and the memory of the men or women who preserve them may well be kept green as an example worthy of imitation by all broad-minded and intelligent people.

OUR readers remember, perhaps, the portrait of the Red Oak which appeared two months ago in this journal. It represented a tree growing in Dedham, Massachusetts, one of the finest of its race in New England. This tree also owes its life, a correspondent now informs us, to the timely appeal of a man who appreciated its value. This

was Thomas Motley, the father of the historian, whose country-place joined the land on which it stands. It had been doomed to swell its owner's wood-pile, but Mr. Motley gave him ten dollars, and the Oak was spared. This wise action of a public-spirited man deserves to be generally known, and some public record of the fact should be made, so that every one who passes by the tree may be moved to follow so good an example. No one can see this great tree without being impressed by its grandeur and charmed by its beauty, and every one who knows the story of its rescue will feel more profoundly grateful that it is still standing.

The Dedham Oak now belongs to a rich man, a lover of nature and of trees. He can earn the gratitude of all other lovers of nature if he will cause to be placed on it some permanent memorial of its danger and its deliverance. The love of trees and the veneration for those which have attained great age or unusual size is not a distinctively American trait. It is one, however, which every lover of his country should encourage, and for this reason the action of Dr. Hitchcock in saving the great Manzanita in California, and of Mr. Thomas Motley in saving the great Oak in Massachusetts, deserve to be placed on record as worthy examples which others would do well to emulate.

New England Parks.

FOREST PARK, SPRINGFIELD, MASSACHUSETTS.

THE Connecticut valley is a region of beauty. As the traveler from the east comes toward it by rail, he is escorted part way on his journey by that lovely tributary of the Connecticut, the Chicopee, whose low bordering hills lead up gradually to the bolder slopes of the Holyoke range, with its fine commanding peaks and strongly marked outline, rising abruptly from the shores of the greater river.

In the month of July these heavily wooded slopes are golden with Chestnut-blooms, and at all seasons the wealth of forest-growth is apparent on the hills and in the rich, well-watered bottom-lands, through which flow numerous minor streams to swell the winding, stately river which is the pride of all central New England.

The town of Springfield is most delightfully situated, its business portion lying along the river-level and its dwellings climbing the hill to point above point, from which the outlook grows more and more commanding as you ascend, until the wide beautiful valley unrolls before the beholder with its imposing stream curving grandly at his feet.

In a boat at sunset, drifting under the great bridges, and looking up at the steep rocky shores from the level of the river, one feels regret that a boulevard could not have been planned along the brink of the stream for the greater enjoyment of the view, but on the heights there are fine outlooks from which the whole scene can be contemplated, and there is perhaps none finer than that from the estate of Mr. E. H. Barney, which is ultimately to form, perhaps, the most attractive portion of that noble pleasure-ground which the public spirit of certain citizens of Springfield has provided for its people.

Forest Park is comparatively a new acquisition of the city, but as many as twenty years ago the picturesque value of the locality was recognized by some of the inhabitants, and Mr. O. H. Greenleaf, Mr. George Hathaway and the late Mr. Samuel Bowles, editor of the *Springfield Republican*, purchased a tract of land in this region with an idea of reserving a part of it for a park and dividing the rest into building lots. Much of this property came ultimately into the hands of Mr. Greenleaf, who having, during his travels in Europe, become interested in places of recreation for the people, conceived the generous idea of giving it to the town, and accordingly in 1883 presented the city with a deed of seventy acres, with a request that it should be made into a public park. This included a boggy meadow bordered by ravines and some open fields edged with woods. The same year twenty more acres were acquired by purchase, which furnished the city with a tract of ninety acres, which it began forthwith to improve and utilize.

Slowly a sense of the importance of the acquisition dawned upon the inhabitants of Springfield. For a long time the appropriations for clearing and grading were made grudgingly, and the representations by the commissioners of the importance of buying more land were disregarded. The work was put in charge of Mr. Justin Sackett, a local landscape-gardener, who, without any definite plan, proceeded to free the land from rubbish, build the roads and drain the marsh, so far as the limited funds at his command would admit. Thanks to his judgment and sense of the picturesque, as well as to the conformation of the soil, the results of this happy-go-lucky, piecemeal method have proved much more satisfactory and pleasing than might have been expected from an unstudied scheme; and when, in 1890, the establishment of an electric railway brought the Springfield world easily to the gates of the park, everybody was full of enthusiasm and astonishment at the beauty of the spot.

The result was an appropriation for the purchase of some adjoining property, and the building of a Shelter at the entrance. During the past year 250 acres have been added to the park, partly by purchase and largely by gifts from other public-spirited citizens. The most notable acquisition is the fine estate of Mr. E. H. Barney, consisting of about 110 acres, in which he retains merely a life-estate, leaving the whole of it, including the homestead and other buildings, to pass to the city ultimately, as a memorial to his only son.

The city thus has come into possession of a well-watered and well-wooded region of nearly four hundred acres of extraordinary variety of surface and unusual natural beauty.

At the entrance, which is approached by the electric railway, the ground is level, and a wide grassy space is encircled by fine trees, among which the drives wind in leisurely curves, giving attractive views of distant hills, and sweeping aside here and there to spare some monarch of the forest. Two Pines thus left form a very noble feature near the entrance. After leaving this part of the grounds you reach a series of ravines, wooded and hung with ferns from top to bottom, around whose natural curves the path winds in a succession of undulations. These ravines consist of a subsoil of clay covered with about six feet of sand, which shifting surface, washed by the spring rains into charming hollows, is the cause of the fern-hung dingles which so delightfully diversify the park. Winding down the side of one of these declivities by a steep road, too steep for the comfort of pedestrians, you come to a long stretch of green meadow, a valley between two ranges of irregular hillocks, through which flows a little stream, the drainage of the former marsh.

This stream, dammed at intervals, forms a series of ponds, with many cascades, and a rivulet, which add to the beauty of the charming scene. The undulations of the steep little hills, covered with trees of all kinds, growing with that luxuriance peculiar to this region, the soft unbroken turf stretching beside the level, shaded drive-way, the wandering brook, the two ponds with their floating birds and tiny island, the long vista, down which one looks to more dark ravines crowned with magnificent Chestnuts, with Oaks, Maples and Poplars, and numerous other varieties of native trees, make a scene of park-like beauty, peaceful and joyous, suggestive of recreation and delight.

Pursuing your way down this long valley, with unexplored wealth of forest on the left, you ascend the heights once more at the other end, and, after some driving, come to an elevation from which there is an unrivaled view of the Connecticut valley, with the town nestling in a great curve of the river, and behind it the striking range of mountains, Mount Tom and Mount Holyoke, rising blue and imposing against the sky, with their attendant hills in jagged outline behind their two lofty peaks.

A little lower down is the Barney estate, which also commands a very beautiful view of the river, the mountains and the town, with its spires and bridges, and here there will, in the future, be a water access to the park, so that a line of little steamers can ply back and forth between the city and its pleasure-ground, giving a delightful means of access to its coolness and shade. This very beautiful view, combining the human interest of the town with the charm of the majestic river winding royally through its fertile valley, and the imposing group of purple peaks meeting into a cloudy background with forms that reproduce the outlines of the mountains, until one can imagine range upon range behind the Holyoke hills, is inexhaustible in attractiveness, and appeals to every taste. To me the touch of humanity in the picture gives it a final charm. Without those clustered towers and chimneys, with their light overhanging smoke to soften unsightly outlines into misty grace, the deepest tone would be lacking in this fine harmony, the human note being ever the richest and most penetrating, even as a clear voice is heard above an orchestra.

This part of the park rejoices in a wide brook, the Pecowsic, a stony-bedded brawling stream, once so dark and densely wooded as to be thickly stocked with trout. Its bed has been widened, and in places enlarged into shallow ponds, where

grow numberless varieties of Nymphæa and Lotus, and even the great salver-like leaves of the *Victoria Regia*.

The Lotus-roots live all winter under seventeen inches of ice, and send up their tall stems and great white and rose-colored and blue blossoms in wild profusion. Here the Water-lilies show all the varieties of color of which this charming flower is capable, even yellow blossoms mixing with the white and pink and blue ones.

Mr. Barney has interested himself largely in trees and shrubs, and the many varieties of valuable specimens that he has collected will in years to come help the landscape-gardeners of the park to new and interesting effects. He has planted numerous rare evergreens, and has large nurseries for the propagation of different arborescent and herbaceous plants, which, as time passes, will multiply so as to be of service in future decoration of other parts of the grounds, when formal gardening shall have entered into the scheme, thus making generous provision for generations to come as well as gratifying his own taste.

The land all about and in the town of Springfield lies with the same peculiar picturesqueness in these curious hills and vales caused by some long-spent tide, hinting of other ages, and a still more magnificent river, the ice of which may have ground out these lovely curves and modeled these varying surfaces through untold bygone years.

Long ago the green valley of Forest Park must have been a water-course, flowing between those high wooded banks to swell the mighty flood of that primeval river. What changes it has known, from the time when the receding tide left it to swampy solitude till the care of man reclaimed it from picturesque desolation to its present cultivated beauty!

One fault I must find with the management of the little stream that drains the former marsh, and that is, that in portions of its career it is so straight as to resemble a canal rather than a natural stream. This is a fault most easily remedied by widening and curving the channel at intervals, and introducing some large rocks, over and around which the water might tumble and meander with more seeming naturalness. It is ungracious to criticise where there is so much already to delight the eye, but Forest Park is not a completed work of art, and is still open to suggestions as the labor progresses.

With its unrivaled natural advantages, the luxuriance of its vegetation, its diversified surface and its glorious points of view, there is no reason that the artistic sense of many landscape-architects should not contribute to the entire development of its extraordinary natural beauties to their best advantage. Its miles of as yet untouched surface can be treated in new and charming ways, for there is scarcely any limit to the surprises which it possesses and the artistic use that can be made of them.

Year by year new acres will be added to its already magnificent extent, affording fresh outlooks on the noble river and its attendant mountains. The little streams that now drip from its rocks into natural basins, to satisfy the thirst of the pedestrian, can be utilized in many a graceful fashion. The rustic pavilions that already afford agreeable shelter to its visitors will be multiplied in yet more charming forms, without detracting from the general effect. There is room enough for wild and undisturbed forest, and for pleasure-grounds to satisfy the requirements of an urban population constantly increasing.

The admirable generosity of the citizens is not to end here, and as time goes on the men of Springfield will rejoice in adding to their beautiful pleasure-ground such architectural and sculpturesque decorations as seem appropriate to its development. The haphazard arrangement which has proved so popular in Mr. Sackett's hands will probably, as the park's resources increase, be supplemented by careful planning of the yet untouched portions of the grounds, and new combinations will be formed to give added interest and variety to the endless drives and walks, and less abruptness to their slopes.

Not more than one-fifth of its surface has as yet been developed, so that it still has enormous possibilities. The trees are very vigorous and healthy, and many of them are of great size. Some of the huge Chestnuts are a hundred feet high, and the groves of tall Hemlocks and Pines are of exceeding beauty. Among them the birds sing and squirrels chatter, and the rabbits sit by the edges of the paths, so tame that they have been known to bite the children who sought to play with them.

The whole aspect of this charming retreat is joyous and attractive. Everything about it suggests recreation and delight, the admixture of wildness and cultivation, the lack of formal gardening, and the sweet rural aspect even of its most carefully tended portions, are gratifying and enjoyable.

The Springfield people may well take pride in the possession of a resort of such unusual and varied beauty, and it is to be hoped that in time they will honor the men to whom they are so largely indebted, by some memorial tribute to their munificence here on the spot which they owe to their wise forethought and admirable beneficence.

It seems, too, as if some name more distinctive and of less common usage might surely be found for so unique a spot as this, a name that would characterize its peculiar features, and separate it in the memory from other pleasure-grounds in other cities where forest-parks abound; and to a spot which, from the numerous aboriginal relics found here, must have been a happy hunting-ground of the red men, some Indian name, significant and melodious, might well be applied, in the syllables of which might be embodied the slopes and streams, the trees and river, which in this lovely park are so rarely and beautifully combined.

Hingham, Mass. *M. C. Robbins.*

Late Persisting Leaves on Trees.

AS the autumn advances and the leaves fall more or less gradually from the different kinds of deciduous trees, it is of interest at the north to note those which have a tendency to hold them the longest. A study of this point might be particularly interesting to people planting trees about residences which are only intended to be occupied until the late autumn, perhaps until the latter part of November.

It is well known that different species of deciduous trees vary very widely in regard to their character for shedding or holding leaves, but no hard-and-fast rule can be applied to any of them, because even different individuals of the same species show a marked variation in this respect.

Such a frequent question as: What species of New England Oak is it which holds its dry leaves until well into the winter, or until the buds start in the spring? may be answered by the statement that it is a habit common to no particular kind, but may occur on individuals of several species and also on other trees besides Oaks. Very often it is an indication of disease, and sometimes we may infer from the circumstance that the wood has not thoroughly matured and the leaves ripened before being unnaturally checked. Almost every practical man must have noticed that the dry leaves cling long to a limb which has been cut off before the end of the growing season.

Of course, in some cases, the late holding of leaves indicates that the plant is likely to prove evergreen in more southern regions. *Magnolia glauca* is a fair example of such a case. In our northern gardens the leaves keep comparatively green and fresh-looking, and persist until very late; but, unless the trees are in exceptionally moist and sheltered situations, the foliage usually disappears before the winter is over.

Other truly deciduous trees at their northern limits appear to have a tendency to hold their leaves late, and it is also noticeable in many trees of a naturally more southern range which have been introduced and found hardy further north.

It is often a peculiarity of our White Oaks (*Quercus alba*), and occasionally of other trees, that the leaves on the shorter, lower branches remain on them in a dry and withered state long after the upper leaves have fallen. The reason for this is not very clear, but it may be that the lower branches, being much shaded, do not mature so well as those above. Young trees, more than old ones, often show a tendency to hold their leaves; and situation sometimes has an influence.

Fruit-trees, as well as shade-trees, share similar peculiarities, although here there is a greater uniformity among the individuals of each variety, brought about by cultivation. The early Astrachan, for example, ripens and loses its leaves many weeks before the American Baldwin, the fruit of which matures late, and which retains a large proportion of its leaves in a comparatively fresh condition through the month of November.

Of the foreign trees which have been introduced, a few are noted for the persistence of their foliage, as compared with allied native species. The English Elms (*Ulmus campestris*) are almost invariably covered with leaves when the American Elms beside them are leafless. The English Oaks grown in this country are also often remarkable for the abundance of fresh-looking foliage which they occasionally retain to the end of November; and the English Hawthorn sometimes retains its verdure better than almost any other of the smaller trees.

Among our native trees the Scarlet and Black Oaks (*Quercus coccinea* and *Q. tinctoria*), the Red Oak (*Q. rubra*) and one or two others hold their leaves quite late, and they remain dark and smooth, without bleaching and twisting as do the leaves of the White Oak.

Our Walnuts (*Juglans*) are notorious for the ease with which they part with their foliage, while, on the other hand, their allies, the Hickories (*Hicoria* or *Carya*), generally hold a considerable quantity of their dead, dry and shriveled leaves with a surprising tenacity through many hard frosts and high winds.

The Beech also holds its leaves later than the majority of trees, and, apparently, there is not so much difference between the indigenous and the European species in their period of falling, although the latter keeps a fresh appearance for a longer time. Young Beeches are, apparently, apt to retain their dry foliage longer than large trees; but any one who has walked through Beech woods in winter cannot have failed to notice numerous cases of both old and young trees retaining a considerable quantity of leaves which had become so bleached that they were almost of as pure a white color as the snow beneath them,

Arnold Arboretum. *J. G. Jack.*

The Colors of Flowers.—I.

TO answer the question, "What is the primitive color of the flowers, and what is the order of progression in 'color-change,' if such there be?" it is not necessary to trace the development of the flower back to primitive times, nor to know whether it was a Buttercup which first unfolded its petals to the sun, or whether it was a Dandelion or something entirely different from either, for the same laws govern the coloration of all flowers, whether they belong to the order *Ranunculaceæ* or not, and whether they are primitive or recent; neither is it important to know whether petals were originally flattened and enlarged stamens or modified leaves. Any one can easily solve the problem for himself by a study of the native wild plants growing by the road-side or in the fields and woods, and even if he should restrict his observation to a few acres about his summer residence in the country that amount of territory would be ample.

Mr. Grant Allen, in his admirable treatise on "The Colors of Flowers," published in London in 1882, concludes that yellow is the primitive color of flowers, and he also takes the ground that petals are altered and modified stamens. He writes as follows: "As the stamens of almost all flowers, certainly of all the oldest and simplest, are yellow, it would seem naturally to follow that the earliest petals would be yellow too." Again: "All flowers, it would seem, were in their earliest form yellow; then some of them became white; after that a few of them grew to be red or purple; and finally a comparatively small number acquired various shades of lilac, mauve, violet or blue." "Petals are, in probability, originally enlarged and flattened stamens."

This opinion is also held by others. The Rev. George Henslow, in the "Origin of Floral Structures," writes: "Again, when we come to Dicotyledons and find the prevailing tint of stamens is the same (yellow) . . . we gather probabilities in support of that view, etc. . . . but why the first color was yellow and why it ever gave place to red or blue is unknown."

There are two methods employed by Nature in the development of colors: one may be called the imperfect or foliar development, the other the normal floral process. In the first, the colors, at least apparently, are evolved directly from the green chlorophyl, as the reds, yellows and purples of autumn leaves, for from some green-colored flowers a rather limited number of dull reds, purples and yellows are produced. The reds and reddish purples are, however, rare, and seen mostly on the scales of involucres, where they are common, also on the spathes of several of the *Araceæ*, as *Symplocarpus fœtidus* and *Arisæma triphyllum* (Jack-in-the-Pulpit), also in Salicornia of our salt-marshes, which turns red in the fall, and in the Castor-oil plant of gardens, which turns a reddish purple in all its parts—leaves, stem and flowers. I do not find a satisfactory example of yellow evolved directly from green among our native plants. It is extremely doubtful if any pure yellow ever immediately succeeds green. This is somewhat surprising when one considers the fact that yellow is one of its component parts. There are, however, some greenish yellow flowers, and these will be considered further on. Among the green native flowers we find *Smilax herbacea*, *S. rotundifolia* and *S. glauca*, central florets of *Aster umbellatus*, *Ampelopsis quinquefolia* and variegated garden varieties, also the garden *Evonymus Seboldianus*, and many smaller, low, degraded plants.

We will now turn our attention to the normal floral method of the development of color, by which all the bright attractive hues of the flowering world are produced, and first take up for inspection *Spiranthes gracilis*, a pretty little plant of the Orchis family, with white flowers spirally disposed at the summit of the scape. The lip is green, fringed around the edges with white, and the other petals are wholly white. A small section of the petals, placed under a magnifying-glass, appears to be colorless and transparent, while the delicate net-work of the tissue glistens like crystal; yet this colorless tissue, in a mass, reflects white. In the same manner a single leaf-like bract of *Monotropa uniflora*, severed from the stem, appears colorless, but two or more placed together, making a greater thickness, reflect a decided white color.

This feature should be especially noted for the reason that, whenever the term colorless is used in this paper, it is not to be taken in its literal sense, but is intended to signify a state of incipient whiteness. Another point to be noted is, that the white color directly succeeds the dark rich green of the lip. In this one plant is found a clue to the solution of a problem which has greatly perplexed botanists, namely, the problem of the priority of color. In *Spiranthes cernua* green has disappeared, the corolla being entirely white. We will now endeavor to demonstrate that the universal law of progression in color, as regards the floral structure, is first from green to white; or, differently stated, Nature, before she begins to paint the more refined and delicate tissue of the petals, by some secret chemical process, completely eliminates the chlorophyl and prepares a perfectly pure and white canvas upon which to essay higher flights of fancy.

The universality of the law that white directly follows green may be demonstrated by the following illustrations, taken from native plants in flower in August and September in south-eastern Massachusetts, from which section also all other illustrations are drawn, excepting an occasional garden-plant, referred to on account of the facility in obtaining it for inspection. By confining our investigation in the main to wild flowers we avoid the complications arising from high cultivation, hybridization, reversion, etc. One should bear in mind, in this investigation, the well-recognized fact that the limb or expanded portion of a petal, and especially the edges of the same, usually are the first to assume the new color; and that where the change of color is not complete the base of the flower, which is least exposed to the light, retains more or less of the primary color.

Examples: *Nymphæa odorata*. Sepals green outside, white inside; petals first partly green, followed directly by white.

Mollugo verticillata. Petals green outside except the edges, which are white; white inside.

Cornus florida. Corolla-like involucre changes from green directly to a brilliant white. This is a large and beautiful flower.

Gnaphalium polycephalum. Bases of the many white involucral scales green.

Hydrangea paniculata. Gardens; marginal flowers green to pure white.

Spiranthes gracilis. Green to pure white.

Bartonia tenella. Base of petal dark green to white.

Daucus Carota. Flowers at first greenish, becoming white, as also the upper half of all the pedicels.

Erechtites hieracifolia. Flowers and tube frequently remaining green, but in many heads the minute corolla becomes pure white, while the tube does not change color.

Habenaria tridentata. Petals light green, becoming white.

Cobea scandens. Gardens; green, seemingly simultaneously to white and purple.

Plantago major and *P. lanceolata*. Green to colorless or faint white.

Cakile Americana. Calyx green, with colorless to white edges, claws colorless or white, limb purple.

Achillea millefolium. Tube and base green, limb white.

Anthemis Cotula. Tube and base green, limb white.

Rhus copalina. Usually green; several shrubs, however, were seen having a considerable number of white flowers, which afterward turned red.

Lilium superbum. Broad base of midribs green, surrounded first by an area nearly white, succeeded upward by many shades of yellow deepening to red. This is interesting in that the whitish region lies between the green and yellow and does not follow yellow.

Heliotrope. Gardens; like preceding, the greenish centre is followed by white, farther up by red or blue-purple.

Chelone glabra. Green to white, the tip remaining slightly green.

Parnassia Caroliniana. White petals show the basal color in the pretty green veining and green color on the outside of the tip.

Polygonum arifolium, *P. Hydropiper acre*, etc. Sepals green to white.

Solanum nigrum. Bases of white petals green, forming a distinct green eye; stamens green.

Polygala sanguinea and *P. cruciata*. The flowers are inconspicuous; the bracts, the showy part of the flower, change from green to white, and afterward to purple.

Calla Lily. Greenhouses; base green, upper portion white.

Petunias and Four o'clocks of white variety have green tubes.

Mignonette. Gardens; green petals have a beautiful snow-white fringe.

Stock. Gardens; base of white variety green, as also of many other flowers.

Examples might be multiplied indefinitely.

Then, too, the inconspicuous, degraded, weed-like plants, such as our two species of Atriplex, Ambrosia, Amarantus, Acalypha, Ludwigia, Euphorbia, Salicornia, Xanthium, Cuscuta, Urtica, Pilea, Chenopodium, etc., some of which have colored, the development is precisely the same as in the petals and stamens; the outer edge or margin of the green sepals first discharges its chlorophyl, becoming white, which gradually spreads over the surface to a greater or less extent.

This tendency to change to white in the sepals is very common; a complete list, however, would require too much space, and, furthermore, be unnecessary, as a few examples from common plants will suffice for our purpose, namely, Cerastium, Stellaria, Buda, Plantago, *Polygonum aviculare*, Amarantus, Arctium, *Eupatorium perfoliatum* and many other species of the *Compositæ*, etc. Commonly, the color of the sepals, after changing, is the same as the petals, as a white Burdock has the scales of the involucre white, a rose-colored Burdock has the scales rose-colored, etc. Thus every part of the flower first changes from green to white, there being ample evidence to prove that the pollen also is at first white. It has been

Fig. 89.—Rosa Wichuraiana.—See page 570.

no petals, and in which the colors of the flowers generally are scarcely developed, yet give valuable testimony, for in every example the color of the stamens and pistils at least, and often some part of the sepals, begins in precisely the same order, namely, from green to colorless and faint white; indeed, in Pilea, which is monœcious, the fertile flower is green, while the staminate has developed to a conspicuous pure white. The yellowish color of Ambrosia is not in the corolla but in the pollen. The tendency, therefore, of these lowly plants is clearly to white and not to yellow.

The color of the expanded portion of the petal especially attracts the eye, but all parts of the flower, including the calyx, may be colored. As a rule the stamens and styles are colored like the petals, but the anthers frequently are of a different color from the filaments, while the pollen at times differs from both anthers and filaments. When the calyx or involucre is used as an argument for yellow as a primary color that the base of the petal of the Rose was yellow. But every one knows that green is composed of blue and yellow, and as either the one or the other element predominates, so will the tone of green be affected. Not only in the fall, but in early summer, the foliage displays various shades of green, and even a blade of grass of one species will differ in shade from that of another, one being, perhaps, a dark or blue-green, the other a lighter or yellowish green; under these circumstances it is not surprising that, by the eliminating process, a yellowish green, very much thinned down, may be mistaken for a true yellow, especially when the area of color is of the smallest dimensions. The writer has examined many petals of *Rosa Carolina* and is convinced, notwithstanding the smallness of the light-colored base, that the color immediately below the rose or pink is white and below the white a mere vestige of

the original color, namely, a yellowish green, and this is in exact accordance with the principles laid down in this article. Concerning the list of wholly green flowers near the commencement of this paper it is not necessary to consider the question of degradation or retrogression from brighter hues, the simple fact being that there are such flowers, and that when they change color, as they frequently do, it is always to white. Examples: Erechtites and Rhus.

All wholly white flowers, except where the transition could be observed, of course, would be of no avail in our researches, and so are not referred to. Without a single exception every flower that came to hand of a white color was developed directly from green, without any intervening color. The proof is overwhelming that white immediately follows green and is the primitive color, unless it can equally be proved that some other color also directly succeeds green.

New Bedford, Mass. *E. Williams Hervey.*

New or Little-known Plants.

Rosa Wichuraiana.

THE handsome Rose which is figured on page 569 was sent to the Arboretum by Mr. Louis Späth, of Berlin, in 1888 as *Rosa bracteata*, but when it flowered two years later it was found to be the *Rosa Wichuraiana* of Crépin,* a native of Japan, and previously confounded with *Rosa Luciæ* of that country, and still earlier with *Rosa sempervirens*.

Rosa Wichuraiana is remarkable in producing slender prostrate stems, which grow ten to fifteen feet long in a single season, and cover the ground as with a dense mat; they are free of prickles and produce short, stout, straight or slightly recurved spines, and in moist ground develop rootlets freely. The leaves are three to nine-foliolate, with obovate or nearly orbicular blunt leaflets, which are sharply and coarsely serrate, glabrous, very dark green and lustrous, and from a third to two-thirds of an inch long. The stipules are adnate, usually conspicuously toothed, and vary from a third to half an inch in length. The flowers are produced here in great profusion from about the 8th to the end of the month of July, and during the remainder of the season appear irregularly and less abundantly; they are pure white, an inch and a half to two inches across, very fragrant, and are borne in short, broad, pyramidal, terminal, few or many-flowered clusters. The primary bracts are lanceolate, foliaceous, dentate and persistent. The pedicels are stout, an inch long, slightly glandular-hispid, and furnished with lanceolate, denticulate, rather persistent, bractlets. The flower-buds are a third of an inch long, ovoid and abruptly contracted into short points. The sepals are oval, contracted at the apex into rather rigid points, coated with pale pubescence on the inner surface and reflexed at maturity. The petals are broadly obovate, slightly emarginate at the apex, and sometimes rather remotely dentate toward the base. The stamens are bright golden-yellow and very conspicuous; and the column of styles is elongated, rather thick, and pubescent. The fruit is oval or obovate, dull red, and from a third to half an inch long. It matures here late in the season, producing good seed every year.

Rosa Wichuraiana has been used very largely during the last two years by the Park Department of the city of Boston, especially in Franklin Park, for covering rocky slopes, embankments and such spots as it was desirable to clothe quickly with verdure. It appears to be admirably suited for such purposes, and as it grows more rapidly than almost any other vine which has been tried in similar situations, soon making a dense mat over the ground, it seems destined to become a popular plant. Its remarkable habit, its hardiness, the brilliancy of its lustrous foliage, and the beauty of its flowers, which appear when most shrubs are out of bloom, certainly recommend it to the attention of the lovers of hardy plants. *C. S. S.*

* *Bull. Bot. Soc. Roy. Belg.*, xxv., pt. ii., 189; J. G. Jack, Garden and Forest, iv., 44.

Foreign Correspondence.

London Letter.

Chrysanthemums.—The great annual exhibition of the National Chrysanthemum Society has been held this week in the Royal Aquarium, at Westminster. The plants and cut blooms shown were on the whole of the finest quality, and almost every class was abundantly filled. I did not see any very striking new variety among those shown for the first time, Louis Bœhmer being, perhaps, the most remarkable of these. As a flower, this variety has little to recommend it, ugliness of form and dullness of color characterizing all the blooms shown here; but as a wonderful development from the original Chrysanthemum it has much interest. There were about 500 varieties submitted to the Committee of Certificates, but only the following obtained awards:

Comte de Galbert (Calvat), Japanese, with large, full, pale flesh-colored flowers; Lord Brooke (Carter & Co.), a large bright orange-colored incurved Japanese variety; Miss L. Allen (Pitcher & Manda), Japanese, incurved; Delaware (Pitcher & Manda), Anemone, large-flowered, with white ray-petals and a yellow centre; Excelsior (Owen), Japanese, very large, colored bright cerise, with white reverse; Mrs. G. C. Schwabe (Owen), Japanese, pale rose and salmon, tipped with gold; Mrs. R. King (Owen), incurved, a good bold flower, full, and colored rich yellow; Florence Davis (Davis), Japanese, a very pretty white-flowered variety, with long elegantly twisted petals; Kate Mursell (Mursell), a pure white sport from Lady Trevor Lawrence; Coronet (Mursell), Japanese, incurved, large, full, deep yellow, a first-class variety; Louis Bœhmer—some very large well-formed flowers of this were exhibited, and obtained a certificate.

Perhaps the most interesting feature of the exhibition was the collection of flowers of Anemone-flowered varieties. The improvement made in this section of Chrysanthemums in the last few years is most marked. Some of the newer varieties have almost entirely lost the character of *Compositæ*, the ray florets being reduced to a single row, while the disk-florets are so large and well formed as to appear like a bunch of Erica-flowers, say, of *E. ventricosa*. Enormous crowds visited the Aquarium during the three days on which the exhibition was held. Certainly this is the most popular flower-show held in London, though not the most select.

Chrysanthemum Sports.—A paper upon this subject was read by Professor Henslow, F. L. S., at the conference of the National Chrysanthemum Society, held on the opening day of the exhibition. Professor Henslow has for many years been identified with studies of plant phenomena as revealed by horticultural art, therefore anything he may have to say upon such a subject as sporting in plants is deserving of attention. He confessed to being unable to explain this peculiarity of cultivated plants, but suggested that ingredients in the soil had something to do with it. He also pointed to the occurrence of sports simultaneously at various places at the same time as indicating that climatal conditions had some influence in causing a plant to sport. From the fact that "nearly all the early imported varieties from China were much more inclined to sport than those raised from seeds in Europe" it is supposed that sporting may be induced by frequently introducing plants from as different a climate as possible from our own. The most remarkable case of sporting is that of Queen of England, a pale blush variety which has sported into six different colors, namely, two golds, two bronzes, a rose and a primrose. It is possible that, by careful observation and experiment, the exact causes to which sporting is due may be discovered, and the production of new varieties in this way be under the cultivators' control. At present we only know that sports do occur, but when or in what form they will come we have absolutely no means of knowing. Varieties of Chrysanthemums are so easily

obtained from seeds that new and promising sorts are now raised in great numbers, as shown by the number put forward for certificates. Some time ago it was hinted that the crossing of different kinds of Chrysanthemums with each other was easily done, and would be demonstrated by an American grower. I am doubtful whether any trustworthy instance of an actually cross-bred Chrysanthemum can be pointed to. One may guess that a seedling bears the characters of two given sorts, but that, of course, proves nothing.

[The Chrysanthemum is, without doubt, a difficult plant to cross-fertilize. It is not difficult, however, to emasculate a few of the outside rows of florets and fertilize them with foreign pollen. If the central florets are then treated with some solution of gum, which will prevent the development of seed in them, it is reasonable to conclude that we know the parentage of the seeds which are produced. When the resulting plants show evident traces of the blood of both parents our conclusions have this additional confirmation.—Ed.]

Gerbera Jamesoni.—Although flowered at Kew two years ago and figured in several periodicals, this pretty Cape Composite is unknown in horticulture. A specimen of it was shown this week at the meeting of the Royal Horticultural Society, and obtained a first-class certificate. It is a stemless plant, with leaves not unlike those of the Dandelion, but more leathery in texture, and nearly erect. The scape is erect, a foot long, bearing a nodding inflorescence as large as that of *Rudbeckia Newmanni*, its color being a rich orange-scarlet. The plant is almost hardy, having stood outside all winter both at Cambridge and Kew. Its scarcity is owing to its failure to ripen seeds in England and to the slowness of growth in its fleshy rhizome, which forbids division. At Kew it has proved a good pot-plant for the greenhouse.

Nerine pancratioides, Baker.—This is a distinct and pretty plant, and will, no doubt, prove valuable to the hybridizer. Nerines being very mobile in the hands of plant-breeders. It differs from all other Nerines in having small projecting teeth between the filaments of the stamens, so that it has almost a distinct corona, a character which is indicated in the specific name. The flowers are otherwise not unlike those of *N. pudica*, but slightly smaller. They are pure white, with uncrisped segments, and are produced in umbels of from twelve to twenty flowers upon a scape two feet long. The leaves are produced at the same time as the flowers, and are narrow, nearly terete, and about a foot long. Mr. J. O'Brien has recently introduced this species from Natal. A description of it is published in the *Gardeners' Chronicle* this week.

Dendrobium Leeanum, Sander.—A plant of this in flower obtained a first-class certificate this week. It was imported by Messrs. Sander & Co. along with *D. Phalænopsis*, to which it bears a close resemblance in the character of its pseudo-bulbs and in habit. The inflorescence, however, is more like that of *D. superbiens*, but the flowers differ from this in being white, shaded with pale mauve on the sepals, with a deeper shade of mauve on the petals and labellum.

Fig. 90.—A Manzanita Tree (*Arctostaphylos Manzanita*).—See page 565.

Phajus maculato × grandifolius.—This is a hybrid raised from the two species named by Messrs. J. Veitch & Sons. It has the habit and robustness of growth of *P. grandifolius*, to which there is also a resemblance in the size and form of the flowers, their color being soft primrose-yellow, tinged with brown, the front of the lip deep chestnut, and curled in as in *P. maculatus*. It obtained a first-class certificate.

Dendrobium Phalænopsis.—The recently imported plants of this Australian Dendrobe have not been long in revealing their true character, there being some hundred and fifty

spikes of flowers expanded on the plants now in the St. Albans nursery. There are no less than fifteen fine flowers on one spike; another has pure white flowers, others pale rose, and so on to the deep crimson of the variety known as *Schræderianum*.

Vanda cœrulea.—Large importations of this Vanda have recently reached England, chiefly through Messrs. Low & Co. and Sander & Co. Many of the plants arrived in perfect health, having scarcely lost a leaf on the way. The treatment required by Orchids of even the most delicate constitution during transport is now so thoroughly understood by experienced importers of Orchids that many plants, which previously reached England with scarcely any life left in them, are now brought long distances over land and sea without much loss of vitality. As an instance of this I may point to a plant of *V. cœrulea*, imported last year, and flowered lately in Lord Rothschild's collection. It was one plant, not a made-up specimen, and it bore seventeen flower-spikes with over two hundred flowers, all opened together.

London. *W. Watson.*

Cultural Department.

Notes on Small Fruits.

ALLOW me to make a few observations upon Mr. Hunn's "Small-fruit Notes" in your issue of November 11th. I have not found Carman any earlier or better than Souhegan. Lovett's Early and Brackett's 101 fruited with me this season for the first time, but the drought was so severe I defer an opinion of them till another season. I fear they will prove an easy prey to anthracnose, like all the Black Cap family. I think No. 101 will be nearly equal to Gregg in size, more hardy and of better quality, but not as sweet as Palmer. Schaffer, for size and productiveness, beats them all; but it is not hardy here, and suffers badly from anthracnose.

A few years ago I was one of a club to purchase 10,000 or more of Quinby's Favorite Raspberry. Investigation as to its origin resulted, in the statement of the party furnishing the plants, that it came to him in a lot of Cuthberts, and proved so superior to them that he was rooting the latter all out and planting all his spare ground to the new foundling. He said that he knew nothing of its origin, and cared less; that it would not increase its value a particle to know its parentage, etc. When the plants fruited a small proportion proved to be Cuthberts, or, at least, so nearly identical with the Cuthberts I had that I could not detect the slightest difference, and the remainder of the plants, fully two-thirds, if not more, were of feebler growth, and produced a much smaller roundish berry, many of which were imperfect and inclined to crumble. After gathering three or four crops I became disgusted with the whole patch and tore them out. As far as I have learned, the venture with other members of the club met the same fate. I have never seen any mention of the variety since, till Mr. Hunn's article met my eye. I had never made any report on it, and should not now but for Mr. Hunn's note. He says: "It resembles in a marked degree Cuthbert, both in growth of canes and the questionable habit of growing a large number of suckers; in flavor it resembles the Cuthbert also." The only difference he marks is that the fruits average larger, are deep red and very firm; but Cuthbert is also deep red and firm. I have repeatedly examined Quinby's Favorite, have picked bushels of them, and am free to say I consider them Cuthberts, and nothing else. If there are two varieties there ought to be some distinguishing features by which they can be recognized. Variation in size may come from soil or cultivation, and firmness may depend on the weather. I should like to hear some further testimony. Perhaps Mr. Hunn's Quinby differs from ours. It is an important matter to have the identity of the plant established.

Erie Blackberry seems to be mixed—some plants giving heavy crops, a whole cluster ripening together; others bearing very lightly, and ripen gradually. They gave us a better crop this season than they ever did, but they differ but little from the Rochelle. They must be carefully picked and thoroughly ripened, or they are too sour; but many persons relish this acidity. The old Dorchester is the only blackberry I ever found that I consider palatable in a fresh state unless fully ripe. This need not be dead-ripe to be good; but, after all, I have never found the berry that outrivaled the Kittatiny, all things considered.

Of Black Currants, the English, Naples and Lee's Prolific differ but little, and are the only ones tried. Beyond a few bushes for those who like them, they are of little value.

Montclair, N. J. *E. Williams.*

Apples in 1891.

Summer Apples.—The Early Harvest, so popular with our fathers, is too far surpassed by recent acquisitions to be worth growing. The Sweet Bough remains our best summer sweet apple. It does not bear as well as formerly, nor are the trees as healthy. All our sweet apples, with the exception of Talman's, are favorites of the codlin moth. Red Astrachan has been overplanted, and is no longer a profitable market sort, but is invaluable for home use. It is an enormous bearer in alternate years. This year it was nearly a dead loss to large growers.

Summer Rose is the most delicious of summer fruits. It is a small apple of exquisite coloring, and overbears. It must be thinned early after setting. It is not valuable for market. Yellow Transparent is one of the Russian apples, of fine quality and great beauty. It bears when very young, and continues a heavy cropper. It must not be too largely planted, as it ripens with too many good rivals. Primate is an apple of which too much cannot easily be said either as to quality, looks or liberal yield. It is of the first class. For table use it is not surpassed at this season. Summer Strawberry; this begins to ripen close after Astrachan, and is not through till October. For a table apple, it is one of the best. I know nothing finer to pick from the tree and eat from hand. It has done admirably this year.

Autumn Apples.—Alexander, one of the Russian fruits, is a fairly good apple every way—large, handsome, prolific. Fall Pippin is a name given to several kinds of apples, but the one entitled to the name is a large, extra fine, very old fruit, yellow and rich. It drops too easily, and is unprofitable every way. But as it ripens in November it is invaluable as a home fruit. Fameuse, or Snow, surpasses all other late fall apples, either for table or market. It is medium-sized, almost entirely red; quite a copy of Jonathan in size and color. It bears enormously and ripens through October and November. It does not rot easily, and, with a few others, fills the breach between fall and winter fruits. Gravenstein is a September apple of the finest quality and best size. It is equally good for table and cooking. It begins to ripen early in September, and holds out till the middle of October.

Porter tallies very well in ripening with Gravenstein. It varies in quality on different trees; is best on old ones. It is a great cropper, and this year thousands of bushels have gone to waste. Autumn Strawberry is a noble apple, of medium size, striped red. It is a first-class dessert fruit, and an excellent cropper. Does rather better in Michigan than here. Harding is a delicious fruit, to which my attention has recently been drawn, just in time to save it from extinction. It is a seedling among the trees planted from seed by Dominie Kirkland, missionary to the Oneidas, and is one of the most admirable table apples I have ever eaten. It has been locally called, sometimes, Kirkland; but that name has gone to another apple. It grows on the farm of Lyman Harding. It is ripe through November, along with Fameuse, and is quite as good and larger.

Clinton, N. Y. *E. P. Powell.*

Carnations.

THREE years ago my employer imported a number of English tree, or winter-blooming Carnations, for the purpose of comparing them with American kinds. The varieties were imported for the best, and, no doubt, they were as good as any grown abroad. We did not find one worth perpetuating, and this was after what seems to have been a fair trial. The plants were imported in the spring, and were evidently layered plants, which had been kept over in a cold frame. As the American method of preparing plants for blooming is very different, I at once began to apply this treatment to them, with the object of testing them along with the ordinary kinds in the greenhouse the following winter. They were planted out with the others in the open ground, and, being stocky plants, made quite large stools. They were housed at the same time as the others, and in every way were subject to the same treatment, but refused to bloom until late in the spring, and consequently were of no value for the purpose for which they were imported. They behaved very much as ordinary summer-blooming, or border Carnations.

I did not, however, consider that this test was fair, and therefore I took "pipings" of these along with the American varie-

ties, determined to subject them to the same conditions all through the season. The result was the same. As, however, a few blooms were of colors we desired, I kept them till last winter, with scarcely better results. I recently visited the greenhouses belonging to Joseph Tailby, of Wellesley, the veteran Carnation raiser and grower, who kindly gave me some valuable information regarding the history and development of the American type of Carnation. When I told him of my experience with the imported varieties, he said the same had generally been his, especially with regard to the English varieties. His opinion is, that the American Carnation, as it is, is the result of adaptation, by selection and acclimatization; and when I suggested to him that the first Carnations came from somewhere, he said that the French varieties had always succeeded better here, and had been the parents of the best American varieties. Boule de Neige, La Purite, Madame Carle, A. Alégatière and De Graw (parent of Mrs. Fisher, perhaps best, new white) are French varieties which are still grown to some extent. The ideal Carnation, in addition to blooming freely, should have solid, erect, pointed foliage, through which air and sunlight can strike the soil. The importance of this will be readily apparent when it is remembered that broad, flat, dense foliage must hold moisture, causing dampness and decay of foliage. Stiff, wiry foot-stalks are another necessity which we too often get with the lack of solidity of bloom, as in the case of Lambourn and Lizzie McGowan, two very pretty whites, which, however, are thin and will not travel. A. Alégatière is one of the best scarlet flowers we have, but the stem is too weak, and, withal, brittle, causing the flowers to droop, and so is fast being displaced by Florence and Hector, American varieties with stiff stems. Grace Wilder, the best and most extensively grown of all rose-colored varieties, was raised by Mr. Tailby. It was a seedling from Boule de Neige (white) × La Purite (rose). Boule de Neige proved an excellent seed-parent, and along with Grace Wilder came some seedlings, giving shades of color, which would be valuable at this time although undesirable then.

A good marketable, winter-blooming yellow variety is a want long felt, but soon to be filled. Among border or summer-blooming varieties we have some excellent yellows, but they almost refuse to bloom in a greenhouse. The French have produced a few doubtful yellows of free habit, but poor constitution and color, and it is on these, with the good border-yellows, that Mr. Tailby has been working. Results were unsatisfactory, and so he, last year, tried Florence (scarlet) with better results, getting good and distinctly intermediate color as a result of the cross, but no clear yellow; still he is satisfied he is on the right road, and thinks by crossing back he will get what he needs. It is a great step, certainly, to get an infusion of yellow and yet retain the free habit of the seed-parent. The crossing of Florence (scarlet) and Anna Webb (deep crimson) has produced an intermediate shade reminding one more than anything of the Chrysanthemum Cullingfordii, having precisely the same velvety texture. But there is something more important than this in this seedling, and that is its excellent habit, for it is far superior to Anna Webb and Ferdinand Mangold, the two prevalent crimsons, in constitution and free-flowering qualities.

Numerous sports have been produced, including white, pale rose, salmon and purple flowers, from Grace Wilder. Lately there was in bloom a salmon-pink sport from Hector, the new scarlet. It is a color which several raisers have been trying to get. All of them, however, have lacked a sufficiently hardy constitution or free-flowering habit to make them worth perpetuating. If this variety holds its color, with the good qualities of Hector, it should prove valuable. Strange to say, however, the habit is different and considered better, being more dwarfed and erect.

There appears to be an established conviction among Carnation-growers that locality has much to do with success or failure in the case of certain varieties. Soil, probably, has more influence than locality. One thing is certain, that Grace Wilder needs a light soil, and Anna Webb and crimsons generally, a heavy one; and here I venture to suggest, that as most marine plants are characterized by glaucous foliage, those varieties, like Anna Webb, having a distinctly glaucous foliage might be improved if a little salt were added to the soil. Wood ashes, containing the salts of potash and iron, ought also to have a beneficial effect.

Wellesley, Mass. *T. D. Hatfield.*

Eulalia gracillima univittata.—This fine ornamental grass should not be confounded with the well-known varieties of *E. Japonica*. The newer plant has been extensively catalogued as *E. univittata*, and the tendency is to associate it mentally with the older kind, and therefore it has not been so widely distributed as it deserves, for it is quite distinct in appearance, and it may be employed in places where the older *E. Japonica* would be quite unsuitable. *E. gracillima* does not exceed four feet in height under the most liberal treatment, and this is one of its most useful characteristics, for it can be used as a centre plant in large vases to the best advantage. Its foliage has a tendency to assume a horizontal position when fully matured, and this, with the white midrib of the leaf, gives the plant a very distinct appearance among ornamental grasses.

Our plants were originally obtained from Monsieur Lemoine, Nancy, from whom so many desirable plants have emanated, but the native country of *E. gracillima* is, without doubt, Japan. It has been described as perfectly hardy in the United States, but this needs confirmation. Perhaps some reader may be able to enlighten us. Our own stock has hitherto been too limited to risk losing it by leaving it out during winter in these colder states, and there is so little trouble involved in lifting the roots and storing them in sand in a cellar that we usually adopt this method and plant them out again in newly enriched soil in spring. According to Bentham and Hooker, we must no longer call our plants Eulalias, the proper name being Miscanthus; but probably the garden name will be Eulalia for a long time.

Dahlia imperialis.—This is at present one of the rarest of Dahlias in cultivation. Why this is so is not easily understood, for there is no other Dahlia so worthy of a place as this species, if space can be given it at this season, in a greenhouse. The word space means a good deal here, for, while two square feet of pot-room is enough for a well-developed specimen, it must have at least eight feet of head-room. Our plants were grown out-of-doors until frost came, when they were about five feet high; they immediately showed flower-buds, while the plants rapidly grew three to four feet higher. The first blooms are now open, and we shall have a succession of them all winter. They are very suitable for cutting, as they last a long time in water. While most other Dahlias have a flat outline, the flowers of the Imperial Dahlia are broadly campanulate, and resemble a Lily much more than a Dahlia in outline, the flowers often measuring eight inches across, and the petals being over an inch across and pure white, except at the base, where they are pink. The anthers and pollen are bright orange, forming a pretty centre to the flowers. *Dahlia imperialis*, in common with most of the other species, is native of Mexico, whence the plants were originally introduced into Europe over a century ago, and were at first grown for the tuberous roots, which were said to be eatable, but they never found much favor with man or beast, owing to their acrid or medicinal flavor. All the species of Dahlia are single, the double varieties being the result of the gardener's art.

Montbretias (Tritonias).—In a recent article in GARDEN AND FOREST Mr. Barker says that, so far as he is aware, *M. crocosmæflora* is the only hybrid in cultivation in the United States. But Mr. Gerard and others have noted on more than one occasion some half dozen others of Monsieur Lemoine's productions, such as Etoile de feu, Bouquet parfait, Drap d'or, Rayon d'or, Tigridie, Transcendant and others, all of which are distinct and equal in merit to the original *M. crocosmæflora*. It is a mistake to treat Montbretias as hardy plants, for they certainly are no more hardy than the Gladiolus here in the eastern states. I have known after a mild winter a few stray bulbs to come up here and there in a feeble sort of way, precisely as do Gladiolus-corms of Monsieur Lemoine's so-called hardy kinds; but there seems to me no sort of reason for risking Montbretias in this way when it is so easy to take them up at the same time that Gladioli are dug, and store them away in a cellar in sand or earth that is moderately damp. To grow these plants well requires a rich soil, the richer the better, hence one of the advantages of transplanting every year to a new position. There are, I know, several others who cultivate the newer kinds. My own were received partly from a correspondent in Oregon and partly from another in Indiana. It would be interesting to have the experience of these western growers.

South Lancaster, Mass. *E. O. Orpet.*

Galanthus Octobrensis.—It was with surprise and delight that I found this autumnal Snowdrop flowering in my border in the middle of November. This was somewhat late for the variety, but as the bulbs were received in early September with some other east European varieties, it speaks much for their precocity that they have bloomed with such a short establishment. It is interesting to speculate on the conditions which, through the course of years, have imparted to a local strain of *G. nivalis* the precocious habit of this variety. Like

the other fall-flowering kinds, *G. Octobrensis* is said to be found only in the Grecian Archipelago—this particular one in Albania—from which it was sent some years since. It has been rare in gardens till lately, when the increasing interest in various forms of the Snowdrop has led to the collection of the hitherto scarcer kinds. This plant seems to have considerable vigor, since the recent hard weather—fifteen degrees of frost with high winds—does not affect it. The danger would seem to be that it would weaken from insufficient ripening. Perhaps a warm covering of leaves later will help it in this.

Snowdrops are always beautiful and dainty, and one welcomes them even at this season, though now there is an unmistakable lack of that sentiment which has endeared this flower to so many and is so associated with their normal early spring-blooming habit. Snowdrops are, even when plentiful, not very striking flowers in the garden, and it will be well when small plots of the varieties are grown to cover the beds with some neat-growing Sedums, or similar plants, to serve as a foil to their fragile loveliness. *G. Meehani* would be a capital plant for the purpose. These autumnal Snowdrops will probably never be useful garden-plants or offensively common.

Elizabeth, N. J. *J. N. Gerard.*

[The specimen sent to this office by Mr. Gerard, and which is, perhaps, the first, or at least among the first, to flower in America, was almost a precise copy of the single Snowdrop which ordinarily blooms in late winter or earliest spring.—Ed.]

Correspondence.

What are the Experiment Stations Doing for Forestry?

To the Editor of Garden and Forest:

Sir,—The twelfth number of the *Experiment Station Record*, completing the second volume, has just come from the press. Its issue has been delayed by the preparation of the very full index and table of contents, embracing more than a hundred pages. The *Record* is composed of abstracts of the annual reports and bulletins of the experiment stations, and the index is, in fact, an index to 42 of the reports and 329 of the bulletins issued during the year 1890 and a part of 1891, and comprises 14,781 printed pages. It becomes, therefore, the ready means of surveying the field of experiment station work and seeing what the fifty stations are practically accomplishing.

I find out of between eight and nine thousand entries of the index there are only five under the words "forest" and "forestry." Under the title Trees there are nine entries relating to forest-trees. Under Insects only two have special connection with timber trees. Under Conifers there is a single entry, referring to some valuable notes on this class of trees by Prof. Popenoc, of the Kansas station, and under Evergreens there are two entries, one referring to a list of trees growing on the grounds of the Oregon station, the other to an account by Professor Keffer of the evergreens in the nurseries of the South Dakota station.

There may be, here and there, in this extended index an entry bearing upon forestry subjects in addition to those now noted, but they must be few. So far as a quite careful examination of the index shows, it appears that only seven out of fifty or more stations have as yet published anything relating to forestry. Some of the stations may have done some experimental forestry work which they have not carried so far as to give results warranting publication. But with all reasonable allowances, does not this official record show a marked neglect, on the part of the stations generally, of a subject which has the closest and most important relation to agriculture?

This neglect seems the more inexcusable when we see the work done by some of the stations. In South Dakota, for example, the station originally established for the whole territory of Dakota—though dating its existence only from 1887—has already done such experimental forestry work as to warrant the publication of four forestry bulletins besides what is published in the annual reports. In the very year of the establishment of the station three acres of ground were planted with tree seeds. In April, 1889, Professor Keffer gave the public the results of this experiment. A statement was made of the kinds of seeds sown, the varying depths at which the seeds were placed in the ground, the per cent. of those that germinated, the influence of deep or shallow planting on germination, the greatest growth of the various kinds of seeds, the method of cultivation, atmospheric conditions, and the general result at the time of publishing the bulletin. An account is then given of the planting, in the spring of 1888, of a forest-tree nursery, comprising 12,000 or more seedlings and embracing thirty species. The method of planting and the subsequent treatment are given, with the results at the time of writing. In November of the same year another forestry bulletin was issued. In this Professor Keffer gives an account of the planting of the seedlings in permanent forest-plats, which was done in the spring of 1889. The situation and character of the ground are given, with a diagram showing the relative location of the various species. The method of planting and the subsequent management are described, and the growth from month to month is tabulated. A third bulletin was issued in January of the present year. This bulletin is a report of progress in lines of work previously recorded in the other bulletins. Analyses of the soil of the experimental plats are given, with observations on the root-growth of transplanted trees, and a discussion of the value of a dense leaf canopy. A list of trees specially valuable for forest-plantations in South Dakota, as shown by observation and information, is also given. Still another bulletin was issued in April of this year. In this the importance of tree-planting is urged, methods of grove, street and lawn planting are discussed, and the advantages of certain varieties of trees for groves, streets or lawns are set forth.

It is impossible to overestimate the value of these forestry bulletins, though no adequate idea of them can be given in this brief space. But the question at once arises, Why are not similar bulletins issued by all or most of the fifty stations, instead of being confined to less than half a dozen? There is not a state in the Union where there is not manifest need for forest-experimentation, though it may not be the same as in Dakota. The forest-crop is the great agricultural crop of the country, most important in itself, as also in its relation to other crops. The problem is confronting us, How shall this crop be maintained in adequate measure when consumption is increasing, while the area of ground occupied by trees is decreasing because of the demands constantly made upon it for tillage purposes? We appropriate $728,000 annually to the experiment stations to aid them, in the language of the act by which they were established, "in acquiring and diffusing among the people of the United States useful and practical information on subjects connected with agriculture, and to promote scientific investigation and experiment respecting the principles and applications of agricultural science." The farmers of other treeless states, and of those also where trees abound more or less, may well ask whether the stations established among them are carrying out the full purpose for which they were endowed so liberally, when they fail to give instructions in regard to the uses and management of trees, the kinds adapted to their soil and climate, and the relations of trees to the whole business of agriculture.

Department of Agriculture. *N. H. Egleston.*

Winter Weather in North Carolina.

To the Editor of Garden and Forest:

Sir,—We have just passed through the most sudden and early cold snap I have yet experienced in this locality. The autumn has been continuously dry and sunny, and the cold wave which struck Raleigh on November 16th was the first killing frost we have had. The true temperature was not far from nineteen degrees above zero. Since then we have had sunny and pleasant weather, and I have been much interested in observing the effects of the sudden cold. The day before the frost our late Irish potatoes were still green, and the cold was so intense that it froze many of those which were near the surface. Our beds of Scarlet Geraniums had just taken on new growth from a shower a few days previous, and it is curious to notice that of two beds in the same exposure one had all its plants completely blackened, while the other, not twenty feet away, is scorched all over the top, but still shows green leaves below. In this bed the growth was more dense, and the mass of leaves above protected the lower parts of the plants. Pittosporums do not show a singed leaf. *Gardenia florida*, sheltered by the walls of the college building from the west and north winds, was not hurt at all. Oonshin Oranges, on an exposed hill-top, where the north wind had a full sweep, show no sign of injury. *Agave Americana*, planted on the same lawn, is quite uninjured, and a three-year-old bush of Jerusalem Cherry (*Solanum Pseudo-capsicum*), near by, looks just as happy and full of its scarlet fruit as ever. Olives, of several varieties, received from California last spring and planted for the purpose of testing their endurance of our climate, show no signs of injury. The Tea Roses look worse than anything else,

for the shoots, so red the day before the freeze, are black and drooping now, and the numerous buds are ruined, of course. Our Fig-trees dropped their remaining leaves in a hurry, but no injury to the wood can be seen. A large plant of *Ipomœa Texana*, an erect, tree-like Morning Glory, from the lower Rio Grande, the hardiness of which we are testing outside for the first time, was killed half-way down. It stood in a sheltered place, and was about eight feet high. The lower wood is so hard and ripe that we have strong hopes that the mound of earth we have built around its base will save it.

The extremely dry and sunny autumn had doubtless a great deal to do with the immunity of some things from harm, and the short duration of the cold also should be considered. But this sudden hard frost, coming after such a warm spell, gives me more confidence in the hardiness of the Japan Mandarin Orange, the Oonshin or Satsuma, than any test it has heretofore had. Whether permanently hardy here or not, it seems pretty certain that this variety will move the Orange belt, at least for Mandarins, a long way north of its present limits. Our trees are grafted on the *Citrus trifoliata* stock, which will dwarf them to the size of shrubs rather than trees, and at the same time will make it comparatively easy to give them some protection. We are studying the effects of different modes of protecting half-hardy plants, but with these Orange-trees we prefer to test their hardiness with full exposure.

One Olive-tree, planted on the south-east side of a high board fence, shows a suspicious brownish tinge on the leaves, while the others look as fresh as ever. This is doubtless because the morning sun struck it when frozen. Among other mulching materials, I am trying broken rocks, a little smaller perhaps than good macadamizing metal. As a summer mulch they are admirable; whether they will be of service in protection from frost I am not yet sure about, but in the last short chill the soil did not freeze under them. As a mulch to keep strawberries clean they are first-rate, and I believe hasten the ripening by their rapid absorption of heat by day and radiation at night. Broken flint-rocks are such a plentiful material here that trials are easily made.

In one of our Fig-plantations we have set Pine-bushes all along through the rows upright in the soil. These bushes are a little taller than the Figs, and give the plantation the appearance of a rather thinly set Pine-thicket. Another lot of trees north of these, and on a little higher ground, will have no protection whatever, the object being to try the effect of a light shelter with a free circulation of air. But little will be shown, however, unless the winter is unusually severe, as Figs seldom suffer here, except in hard winters. *Agave Americana* will be tested with full exposure, and also with a shelter to keep water out of the centre.

The behavior of the Pittosporum for the past three years convinces me that this handsome evergreen shrub will prove hardy much farther north than it is generally planted. In the *Gardeners' Monthly* for September, 1876, Mr. Walter Elder writes: "A plant of *Pittosporum Tobira*, four and a half feet high and three feet in diameter, was planted in the open garden of James C. Smith, Esq., 2104 Walnut Street, Philadelphia, in June, 1875. It stood out all last winter without injury, and now, June 5th, 1876, it is in a flourishing condition, covered with sweet-scented blossoms and filling the air with fragrance for a long distance." It would be interesting to know how long this plant survived.

Raleigh, N. C. *W. F. Massey.*

The Paulownia in Kansas.

To the Editor of GARDEN AND FOREST:

Sir,—A spreading tree by the side of the main drive-way in the college grounds here has often attracted the attention of passers by its very large leaves. It is usually taken for some remarkable variety of Catalpa, the resemblance to those trees both in foliage and habit being quite striking. The specimen is a Paulownia, doubtless the most western tree of its kind to be found in the Mississippi valley. It was grown from seed in 1884, and up to 1889 was cut back each spring to the ground, and grown for the rank sprouts which bore enormous broad leaves. In the summer of 1888 one sprout from this root grew to be nine feet high and two and a half inches in diameter. Some of the leaves were nearly two feet broad. In autumn this sprout was cut back to six feet high and wrapped thickly with hay. The winter following being a mild one, it came through without injury, and by the next fall measured four inches in diameter and had made a top growth of seven feet. At present the tree measures twenty-eight inches in circumference and is about eighteen feet high, with a spread of sixteen feet. This is a four-years growth, which it would be hard to find equaled among our native trees.

During the past summer the tree formed its first crop of flower-buds. These are borne in large terminal racemes, and are about the size of a Morello cherry, and have the appearance of being made of thick soft buckskin, so snugly are the embryo blossoms protected from frost by the thick calyx-lobes.

In spite of this care many of the buds were blackened to the heart by a severe frost early in October, and it is very doubtful whether any of them survive the winter.

Kansas Agricultural College. *S. C. Mason.*

Winchell and Green Mountain.

To the Editor of GARDEN AND FOREST:

Sir,—As my note in GARDEN AND FOREST in regard to the similarity of the foliage of the Winchell and Green Mountain Grapes has been extensively copied, it may be proper for me to say that both Ellwanger & Barry and Stephen Hoyt's Sons sent me samples of the grapes which they grew respectively under the above names. If the clusters received from the two firms had been placed side by side and the names removed I should probably have been unable to distinguish them from their appearance. There seemed to be a slight difference in flavor, which may have been caused by different degrees of ripeness or by difference in soils. The vine of Winchell which I have growing did not come from Messrs. Ellwanger & Barry direct, but they have now sent me vines which will be planted for test. Judging from the fruit sent me, if the vines prove as nearly identical as the fruit it will be unfortunate if they go out under two names. We expect to fruit them (or it) next summer and to settle for this section the date of ripening.

So far, the White Diamond is the earliest white grape we have tested. Its clusters are not so compact and handsome as the Winchell or Green Mountain clusters sent us, but the grape is better in quality, and promises to hang on the stem better. A large grower of early grapes in Florida, who was here a few days ago, told us that the Diamond is being largely planted there for early shipment, and he was quite enthusiastic over its quality and productiveness. Grape-growers in the south are rapidly finding out that the Delaware is particularly adapted to sandy lands, and is more exempt from black rot than many others. There is a growing inclination to plant largely of this fine old sort.

Agricultural College, Raleigh, N. C. *W. F. Massey.*

Notes.

The Central Park in this city contains nine miles of drives, five and three-quarter miles of bridle-paths, and twenty-nine and one-half miles of walks.

The house called Claremont, at the end of the Riverside Drive in this city, now used as a restaurant, was occupied long ago by Viscount Courteney, and later by Joseph Bonaparte.

The American Forestry Association will hold a meeting in Washington on December the 29th and 30th. A full attendance of the members is desired, and a strong effort will be made to secure national forest-reservations.

The yield of potatoes to the acre is larger throughout the country than it has been for ten years past, and in some states, according to the Government crop reports, the average for a state is rated as high as 120 to 125 bushels per acre. For the whole country the yield per acre is given at nearly ninety-four bushels.

Chrysanthemum-shows have been successful beyond precedent in England this year, and the same is true of the exhibitions on this side of the water. Before the shows many complaints were heard that the season was unfavorable, but never before were fine blooms displayed in such numbers. Exhibitions were held in a dozen cities, any one of which was superior to the very best in the country a dozen years ago.

In an article on the "Literature of the Garden," published in a late number of the *Gardeners' Magazine*, Mr. F. W. Burbidge, in speaking of John Parkinson's famous "Paradisus Terrestris," says: "I know of no book on gardening and flowers, etc., which possesses quite the delightful old English tone of Parkinson, and, among other remarkable things, this work is famous as containing the first systematic arrangement of Daffodils, or Narcissi, no less than ninety-six species and varieties being illustrated or described in its pages. A modern garden stocked with all the plants of Parkinson's book would be a very good garden, even although it lacked a great many

beautiful flowers introduced since his time—*i. e.*, 271 years ago. It is essentially a book of hardy or open-air flowers and fruits, such as were commonly grown before the days when cheap glass and coal made greenhouses and hot-houses possible."

The sixth annual meeting of the Pennsylvania Forestry Association was held last week in Philadelphia. Addresses were made by Professor Rothrock, Herbert Welsh, John Birkinbine and the Rev. J. P. Lundy, President of the Association. Professor Rothrock offered a resolution, which was unanimously adopted, that the Superintendent of Public Schools in the State of Pennsylvania should recommend that each of the state normal schools should give five lectures every year upon the principles of forestry as related to the public welfare. It was also resolved that a committee should be appointed to consider the advisability of preparing forestry tracts for general circulation, in order to spread a knowledge of the subject as an essential preliminary to any effective legislation.

In the current number of *Meehan's Monthly* it is stated that the Girard estate has been making small forest-plantations in an experimental way to see if it was practicable to grow timber in the coal regions, where nearly every stick has been cut away for props and various other uses connected with mining, so that now almost every piece of plank used there has to be brought from a distance. Eight years ago seedling English Larches and Scotch Pines, one year old, were planted in furrows driven through the underbrush which was growing up where old forests had been cut away. The Larches now average from seventeen to eighteen feet high, and are noticeably healthy. The Larch is a mountain-tree, and thrives in comparatively poor soil, and as these plantings are 1,500 feet above the sea-level the tree has something of its natural conditions. The vigor of the trees shows that they appreciate this position.

Dr. Rudolph Stoll, professor in a pomological school near Vienna, has issued a treatise on "American Early Peaches," illustrated by fourteen colored plates. Peaches of the sort he describes have been cultivated in Europe since the middle of the century, but what he calls "a new epoch in the culture of early Peaches" began in the seventies with the introduction of varieties received from the American grower Hales. These are now very largely grown in the south of France and also in Austria, where the preferred varieties are Amsden, Alexander, Musser and Wilder. "Propagation by means of seeds," says Dr. Stoll, "is as yet certain only with seeds imported from America, as most of the seeds grown in Europe do not come true, and it also seems doubtful whether as early-bearing trees would be produced by European seeds." Propagation by graft is therefore exclusively relied upon in the orchards of Professor Stoll's school. He says that in a climate where the Vine flourishes these Peaches will also flourish either as shrubs or as low trees; that in middle Europe, where Vine-culture is no longer profitable, they will do well on walls facing south, and in more northern countries only on espaliers under glass. The comparative excellence of different varieties as regards flavor he expresses in the following list: Cumberland, Saunders, Amsden, Wilder, Gouverneur Garland, Briggs' May Peach, Waterloo, Musser, Hales' Early, Bowers' Early, Canadian Early and Harper's Early.

The degree to which irrigation must have been practiced by the indigenous tribes of the west, in regions that now have relapsed into a desert condition, is well shown by the station of an Indian "fort" recently discovered about ninety miles below Phœnix, Arizona. The ruins, which are said to be the largest yet found, lie more than four miles distant from the Gila River, and are about a square mile in extent. In the centre is the fort, still very well preserved, and covering about six acres. It is built, says a writer in the St. Louis *Globe-Democrat*, in a very peculiar way. The first of the stories or "tables" of which it consists is about twenty feet in height and "is made of dirt with a wall of boulders laid in cement about the outside. On top of this and of the same height, though only half the size otherwise, is the second table, walled up as the first. On this a smaller one of the same height, and on top of that is the fort proper, constructed of stone and durable. The edges of the tower-tables were used as gardens, and around the walls are hundreds of boulders brought from the river, doubtless for the purpose of casting down on the heads of a foe. In the top fort are many skeletons and human bones, and in all probability the place was besieged and the people died of starvation. A ditch four and one-half miles in length runs by the base of this structure and brought water from the Gila. It is well defined and about thirty feet in width, though it is stopped up and no water runs through it." This immense construction, which was only the central feature of a large settlement, now stands in one of the most desert parts of Arizona, and no one had seen it until it was recently discovered by some miners who had lost their way in the wilderness.

Professor B. D. Halsted concluded a lecture on Injurious Fungi, delivered before the Ohio Horticultural Society, with a suggestion that we should not trust to fungicides alone for the eradication of plant-diseases. He said that healthy plants of strong stock, well fed and not overworked by undue cropping, are the best able to withstand the inroads of enemies of every sort. The half-starved plant is no better able to struggle among the vicissitudes of life than the ill-fed and half-sick man. Blights overcome the one as scurvy does the other. Therefore, the best conditions for the production of profitable crops are the same as those that will most assist in warding off its fungous enemies. Let the seed, soil and surroundings be the best, and a fungicide, so to speak, has already been used when it will do the most good and render the application of others, when needed, all the more profitable. In short, strive to do the best for the fruit-tree or shrub, as such, and a long step will be taken toward overcoming the enemies that break down the weakest hosts first. Having done this we are ready to take up the direct fight of the fungus foes with the long end of the lever. It must be a good, promising crop that will warrant the expense of fungicidal applications, and the larger the promise the greater the profit. Again: When a house or a community is afflicted with some contagious malady, pains are taken that the germs of the disease shall not remain lurking in out-of-the-way places. The carpets, and even wall-paper, are removed and the whole house fumigated or otherwise treated with some germ destroyer. While as thorough a cleansing as this is not possible in orchard, vineyard or garden, there are some measures that could be taken with profit. If weeds are left to mature and scatter their seeds, weeds are expected to follow. In like manner, if all diseased leaves, stems and fruit are allowed to pass the winter undestroyed, we shall reap what we have sown. The burn heap is to be a potent factor in future horticulture. If we continue to scatter the seeds of fungus decay, of that sowing we shall reap corruption.

Mr. Waldo F. Brown writes to the *Country Gentleman* that the Black Locust can be profitably planted for posts, at least in Ohio. He asserts that farms have been sold there at from $20 to $30 an acre, which, if planted in Locust-timber, would yield several hundred dollars an acre in posts within twenty years, and then would make a second harvest quicker than the first grew. He cites an instance of a ten-acre grove which was cut off between 1860 and 1870 and then sold for posts. How much this first cutting brought could not be ascertained, but it was certainly profitable. In just eleven years after the present owner began to sell posts from the second growth, and he has since had a regular income every year. Between 1879 and 1883 he cut 6,608 posts from the ten acres which brought $991, or an average of fifteen cents a post, and ever since then he has cut and sold large quantities. For ten years past this land, which is a steep hill-side unfit for cultivation, has yielded more profit than the remaining ninety level acres of the same farm which have been under cultivation. In another case a row of thirty-three Locust-trees, which had been planted along the north line of a farm for twenty rods, was cut after having grown twenty-five years. The harvest was 400 good posts, worth twenty-five cents each, 600 fence-stakes, worth five cents each, and enough wood to pay for cutting and splitting the posts. From the second growth of this grove the owner has cut all the posts needed to keep the fences on his farm of 150 acres, and he has now 200 posts seasoned for future use. These trees occupy only a quarter of an acre of land. How long one planting of Locust-timber will continue to yield crops no one knows. As soon as a grove is cut off it begins to send up a new crop, which grows rapidly, and will be large enough for post-timber some years sooner than such timber could be grown from seed. Mr. Brown once examined a grove of two acres on which the trees had been cut eleven years before, and found that each stump had thrown up from three to seven sprouts, the largest of which were then being cut. This thinning process went on for several years, until all but one of these sprouts to each stump was cut, and then enough trees were left to make a dense forest. In the thirteenth year after the original cutting 400 posts were cut from two acres.

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Mountain Forests and Mountain Streams.

HITHERTO the people of this country have suffered so little from mountain torrents that reports of their ravages in other lands too often sound like a tale of little meaning, and yet wherever there are high mountains with a sufficiently precipitous slope, and wherever streams flow through material which can be eroded, there is an absolute certainty that the short-sighted policy of clearing away the mountain forest will cause a repetition of the ruin which has been wrought in the French Alps and in many another place within the memory of living men. It is time, therefore, for intelligent Americans to inform themselves as to what an unchained torrent can accomplish, and we begin, therefore, in another column of this issue, the publication of an article which depicts the devastation caused by these furious freshets, which points out their causes and shows the only way in which they can be subdued. The article is not theoretical merely—that is, it does not state what might happen if certain laws are violated, but it records facts, and it has an especial value because it is prepared by the one man who is recognized the world over as master of the subject—a man who has not only observed and studied, but who has been the administrative head of the organized forces employed in the most extensive effort ever made to restrain the outbreaking violence of these mountain torrents, and even to subdue them to human use.

M. Demontzey, who read this paper before the Association for the Advancement of Science in Paris, has been in the French forest-service for forty years, and has risen from grade to grade until he is now at the head of one of the three bureaus into which the forest-administration in France is divided. Under his control come all the operations of reforesting, and in his field he is easily the first living authority. As early as 1853 he was engaged in the important work of reforesting a portion of Algeria, and ten years later he was placed in charge of the immense work which had been recently authorized by law of reforesting the mountains in southern France. The magnitude of these operations, and the success with which they have been carried on, give them high rank among the achievements of human science and skill. M. Demontzey has written a practical treatise on "Reforesting and Returfing Mountains," and his book is the authority on that subject. It has been translated into German, Italian, Spanish, and many extracts from it have been translated into English. The fame of his work has reached all countries, and wherever any laws are to be enacted or experiments made which look toward the protection of mountains from eroding streams, a commission is at once sent to France and to Demontzey for instruction. Italy and Austria, England, Prussia, Denmark and other countries have in this way received direct instruction and inspiration from his labors, and his influence will be felt for good in many lands and through many generations.

The testimony of such an authority ought to have convincing weight, and when he asserts that the clearing away of mountain forests renders the soil a prey to rushing waters, it becomes us to inquire how long we can keep on stripping the timber from our own highlands without disturbing that stable equilibrium which comes from the balance of opposing forces. It is a wearisome thing to repeat such warnings as this, but if Demontzey, after a lifetime spent in the work of reforesting the devastated mountains of France, finds that the story of it is still fresh enough to interest a body of men of science in the capital of France, we ought hardly to wonder that so little attention is paid to the subject in America. That forests preserve mountains has been demonstrated after fifty years of experiment in France, and that the forest is the only means of restoring a wasted mountain has also been amply proved. Fortunately, we stand as yet in no need of such restorative efforts, but it is well for us to know that if we bring this desolation by flood upon ourselves our only salvation will be found in replacing the woods which have been destroyed. Dams, retaining-walls and other works of engineering skill are helpful, but they are dead barriers only, and avail little against forces full of eager life. The aggressive violence of torrents can only be held in check by living agents, which are ever alert, and oppose themselves and their growth unceasingly to counteract and restrain the destructive work of flowing water. There is no safety for torrent-worn mountains until they are clothed again with living trees and vegetation.

It is more than the work of a day to reclothe a mountain with growing wood, but the law for reforesting the mountains has been long enough in force in France to demonstrate that some of the most violent torrents can be tamed. Agriculture has been renewed in places where cultivators had been driven from their farms. Mountains once a waste have been turned into homes for energetic workingmen. Desert slopes, which were not only useless but injurious to the valleys below, are now growing wood, which is not only a protective covering, but it is constantly increasing in value for human use. All this work, however, is accomplished at an enormous outlay. The labor and cost of the work, and the infinitely greater expense from previous loss, might all have been saved if the mountain forests had been administrated with ordinary prudence. The necessity for reforesting is the strongest argument for preserving the forests which already stand. The lesson we need to learn is not that it may be possible for us at untold expense to follow the experience of France and rescue our mountain-slopes and water-courses after the process of degradation and destruction are under full headway, but on the contrary, that we may escape all this loss by a timely effort to save the forest, which France is now taking such infinite pains to restore. We hardly need to be taught that the reforestation of a devastated mountain region is altogether too great an undertaking for private enterprise. But it has been also proved in France that forests are never safe without the protection of some power above that of individual owners. It is the state alone which can restore wasted forests or preserve those which already exist.

A Typical New England View.

TO any stranger desiring to see a typical New England coast landscape, the view from a house built a few years ago on the so-called "Beverly Commons," in the town of that name, might well be exhibited as combining many of the features which make our northern shore interesting and imposing.

The house itself is a rugged stone building, rising abruptly from a crag whose shelving surface slopes almost to the sills of the windows on the land side. The approach to it is through a wild and rocky dell, bordered with Pine-trees, some of which are of great size, with widely spreading branches. The rocks and trees are very striking in form and prepare the mind for what is to come. Little attempt at cultivating the grounds has been made, and the few exotic conifers that have been planted mar rather than improve the natural distinction of the surroundings. Their chief beauty consists in the masses of wild shrubs and herbage which come to the very edge of the irregular fragments of lawn that are here and there apparent near the dwelling, from the sea-front of which the view in all its majesty meets the eye.

In the foreground rises a great ledge of rock out of which spring great High-bush Blueberries of particularly graceful grouping. Beyond and around the ledge Golden-rod and Sumach follow the fine curves of the rocky surface, and then the eye is led gently into the middle distance where the soft outlines of Pines rise in gentle undulations, till suddenly a round, wooded hill forms a strange and striking curve in the sky-line, which is further diversified in the purple distance by bits of the shore, with a light-house on a point running out into the bay, and glimpses of the blue sea broken by the contours of distant islands. As far as the eye can reach the solitude is unbroken, nothing visible but the thin blue water-line with its rocky bluffs in soft haze of remoteness, and the great swell of the Pine-clad hill, of deepest softest green, rolling in noble curves to other masses of verdure that fill the hollows and rise again in echoing curves on either hand, with wide-spreading arms of Pine-trees, a single one outlined here and there against the sky. The middle-distance has somewhat the effect of a great rolling heath, which resolves itself near at hand into component parts of Blueberry-bushes, and Sumach, and other familiar herbage.

When I saw this view the Golden-rods were fading and the Sumachs just touched with autumn red, but when these last are one glowing flame, in startling contrast with the unchanging evergreens, the effect must be still more wonderful, as brilliant color would then combine with noble form to render the landscape extraordinarily beautiful.

A distant view of the Danvers Hills, rising along the western horizon, adds to the charm of this remarkable scene, and glimpses of other points and islands are caught between the swelling outlines of wooded hills, so that the outlook is perpetually varied, and as the mists veil and unveil its loveliness, must be full of mysterious suggestion to those who are privileged to contemplate it at all seasons and hours.

So strange and lonely is the spot, so rugged the house, and so wild the aspect of the ledges with their fringe of native shrubs, that the imagination takes wing, and weaves legends, and dreams of stories of uncanny deeds done in this desolate place, and peoples it with imaginary denizens, with histories and experiences to match the beautiful but savage landscape. The house when I visited it was uninhabited, which added still more mystery and charm to this lonely scene, leaving the fancy free to roam, and to evoke appropriate forms and events for this American Wuthering Heights, which on a windy winter day must be as eerie a dwelling as the one Emily Brontë pictured on her Yorkshire moor.

Unique as is the view, it is curiously characteristic, seeming to combine all the various elements that lend beauty to the majestic New England shore — rocks, hills, the sea, with glimpses of distant islands and elevations, and the simple but impressive forms of vegetation that can find sustenance in the decomposing surface of stones and arid downs.

The Pines are of exceptional loveliness; there is a furry softness about their great masses of foliage, full of lights and shadows, that seems to clothe the rugged surfaces with warmth and comfort. No tree seems so appropriate for a bleak and tempestuous region as this in which nature loves to enwrap her dreariest and most uncompromising wilds. Its aspect consoles, suggests shelter and protection; the roundness of its masses seems to soften the asperities of the hard surface from which it springs. Amid desolation it is the friend of man, affording him a roof by day, light and warmth by night — a pillow for his weary head, a carpet for his aching feet.

In this wide view the Pines appeal most strongly to the heart and give softness and beauty to a scene otherwise appalling in desolation. The fine sky-line without their feathery foliage would be harsh and unsympathetic, the intervening spaces barren and stern, the foreground unsheltered and drear. Thanks to their welcome presence, the eye rests gratefully upon as beautiful a prospect as can anywhere be viewed on the Massachusetts coast, the foreground being in perfect keeping with the distant views, and the whole making a delightful combination for a nobly representative type of New England scenery, in which woods and the ocean are happily combined, in the way that is best seen on that part of the coast north of Massachusetts Bay.

Hingham, Mass. *M. C. Robbins.*

The Colors of Flowers.—II.

Yellow.—Having proved the primary color of flowers to be white, the query naturally arises, Which is the second in the order of progression? Is it red, yellow or blue? Is there, indeed, any established sequence?

Following the method already pointed out we shall endeavor to answer these questions, first taking up yellow flowers. Of course, we must put aside all corollas wholly yellow, such as Buttercups, Potentillas, Caltha, Celandine, Œnothera, etc., and find some whose claw, throat or tube is other than yellow.

The tips of the yellow central florets of the Sunflower (*Helianthus annuus*), for instance, are chocolate-brown, but this cannot be the foundation color, for one should look for it at the base rather than tip; but we find the tubes of *Sonchus oleraceus*, Prenanthes, Hieracium, Lactuca, Leontodon, Taraxacum, the bases of Oxalis, yellow Pansies, the true yellow flower of *Polygala sanguinea*, garden Snapdragons, etc., all of them to be white, some more so than others, but never any other color except it be a special marking. In *Gnaphalium polycephalum* the long tube remains green, while the minute corolla quickly turns from white to yellow. Garden Nasturtiums, Tropæolum, are traced down from orange-red, or even a deeper shade, through every degree of yellow to the most delicate cream color, thereby establishing white as the foundation. Yellow in its lighter shades being nearest to white is more difficult to detect than any other color. Specimens of *Prenanthes alba* would probably be called white by some, yet when placed beside a pure white, as that of *Maruta Cotula*, they are seen to be "off color" and inclined to yellow, while *P. serpentaria* is clearly yellowish; quite likely, in course of time, their colors will become more pronounced.

Within half a mile of my summer residence are sixteen species of Golden-rod (Solidago), fifteen of which are bright yellow; but these are of no avail for our purpose. Nature, however, comes to our aid by leaving the sixteenth in its original white state. We examine it carefully, and find it even lighter than cream-color, substantially white. Yet its variety, *S. concolor*, is yellow. The pappus of the Golden-rods is pure white. Turk's Cap Lily exhibits a small area of white low down about the midrib before the yellow develops.

Mr. Grant Allen remarks in regard to the Daisy tribe as follows, p. 53: "Now, the earliest ray-florets would naturally be bright yellow, like the tubular blossoms of the central disk from which they sprung. And to this day the ray-florets of Sunflowers, etc., are like the central flowers. In the Camomile, however, the Ox-eye Daisy and the May-weed the rays have become white; and this, I think, fairly establishes the fact, that white is a higher development of color than yellow.'

Now, as to the ray-flowers of May-weed becoming white from yellow, we have already proved them (above, under white-flower section) to be derived from green, and therefore primary; as to the central florets, which are yellow and whole-colored, we have, of course, usually no direct proof, but simply because they occupy a central position is not sufficient evidence that yellow is their primary color. Among the Asters similarly with white rays, as in *A. dumosus*, *A. diffusus*, etc., indeed, in many others we find yellow central florets, also red-purple, and both on the same plant, and also mixed in the same head! In *A. diffusus* and several other species the colors change directly from yellow to purple. Here we have, according to that theory, the lowest color and "the latest fabrication" growing side by side under exactly the same conditions, and yet no white or intervening color between them!

But in regard to the central florets of *Maruta Cotula*, notwithstanding the very short tube and the usually well-covered corolla, it has been noticed that the yellow is much paler at the base, and, moreover, some specimens growing in the shade were found in which the tube showed no yellow. Then, too, *Aster diffusus* has central florets varying from deep yellow to nearly white. If specimens of this lightish variety growing in the shade, as, for instance, in a grove or open wood, are examined, flowers can easily be obtained without a trace of yellow in corolla or stamens, and of that apparently colorless but really faint white character noticed in *Spiranthes gracilis*. The tubes of several of the larger species, as *Aster Novæ Angliæ*, *A. Herveyi*, etc., and *Senecio vulgaris*, are at first white.

There is a greater natural tendency to yellow than to red or blue, as shown in the number of yellow-colored flowers, which exceed all others but white. The color, too, responds very quickly to the sunlight, and varies in the smaller Asters, according to the amount of light. Why this tendency exists is not known, but certainly yellow in its lightest shades is nearer to white than any other color—so near that the eye cannot detect its commencement, and on that account alone it would seem to be most natural to diverge in that direction.

A breeder of Cochin fowls of large experience, and himself an artist, and therefore well versed in color, informed the writer that to obtain a perfectly white color the fowls must be kept in the shade, and that if exposed to the sun the white became a straw-color! Another artist remarked: "Yellow color has a great deal of sunlight."

The foregoing examples are of themselves ample proof that yellow is derived from white; but if any one should prefer to see with his own eyes the actual development of a rich, pure yellow from a snow-white petal his wish can be gratified; let him observe *Lonicera Chinensis Halli*, now very common in our gardens. This flower opens a pure white corolla, with pure white stamens and pistil; almost immediately a change of color begins—the precise moment it would be difficult for human eyes to determine—and in a few hours both corolla and stamens become a beautiful yellow. The flower has not wilted nor faded in the least, but, while still fresh, the transformation from white to yellow has been accomplished. Both the pure white and the pure yellow blossoms, with intermediate shades, can always be seen at the same time upon the same vine, the yellow continuing fresh several days. Some flowers show color in the bud, others delay their permanent coloration, like the Fringed Gentian, which is green in the bud and only becomes blue as it unfolds its fringed lobes to the sunlight; others still, like *Cobea scandens*, do not change the green corolla for a day or two after full expansion.

With the example of *Lonicera Chinensis Halli*, before one, the evidence is complete. There appears to be a misapprehension regarding the prevalence of yellow-flowered species; they are not as supposed, at least in this region, in excess of white; the writer, in his "Flora of New Bedford and the Shores of Buzzard's Bay," estimated their number to be equal to the white; but in that estimate the main color only was counted, as, for instance, a flower with a white ground and purple dots or streaks was called purple; a Thistle, with a chalky white tube much longer than the colored part, was counted rose-purple, and disk tubular florets were not counted in; if, however, each species were credited with all its colors, it is plain from the preceding and following examples, which show white in nearly every instance, that that color greatly predominates, and, of course, it cannot be said that "nearly all stamens," if filaments are intended, "are yellow," when not more than one-third of the flowers are of that color. The proportion, however, in tropical or arctic regions may vary from this.

Greenish yellow in petals appears to result from imperfect elimination of chlorophyl from the thicker parts of the petals, such as the veins, etc. The effect is seen in white flowers, as Chelone and Parnassus, also in Fringed Gentian, where the green, frequently remaining on the outside of the lobes, gives them a dingy appearance, or it may result from the development of some blue in a yellow ground, as purples often follow yellow.

RED.—We now direct our attention to the reds, which are the easiest of all the colors to trace, for the reason that the change can always be seen in progress, and that whereas the inception of yellow in its lightest shades cannot be detected, any one can recognize a red on a white ground. It will require but a few illustrations to prove what is already so well known, that red is derived from white, namely:

Achillea Millefolium. Turns from white to rose; specimens occurring wholly rose-colored.

Rhododendron viscosum. White Swamp Honeysuckle is often tinged with pink, while *R. nudiflorum* is wholly pink.

Burdocks. Both white and red occur on the same plant.

White Clover becomes red.

White Pond Lily (*Nymphæa*) becomes pink in varieties.

Cornus florida has a pink variety.

Hydrangea paniculata grandiflora. Changes from white to red.

Daucus Carota is generally tinged with red on its outer circle of umblets as it opens, and in, perhaps the majority of cases, the central floret of the entire umbel, composed of 1,000 or more separate flowers, is usually of a reddish color.

Saponaria officinalis has a white base.

Pluchea camphorata. Base of perfect tubular flowers, colorless to white; the lobes only are reddish.

Many plants, commonly red, often revert to white, as, *Gerardia purpurea*, *Cnicus pumilus*, *Polygala sanguinea*, *Rosa Carolina*, *Spiræa tomentosa*, *Convolvulus sepium*, and others fade to nearly white; and it is a fact proved from observation, that yellow, red and blue colors all fade toward white.

BLUE.—All of the following blue or purple flowers have their tubes or the bases of the corollas of a white color:

Lobelia inflata. Base white; also the tube of garden Lobelia.

Trichostema dichotomum. Lower half lip and tube white.

Sisyrinchium. Occurs white.

Lathyrus maritimus. Keel white.

Liatris scariosa. Tube white.

Gentiana crinita. Base white.

Ilysanthes riparia. Tube white.

Chicory. Has a nearly white eye.

Mikania scandens. Varies from white to red-purple.

Cakile. Claw colorless to faint white; limb purple.

Brunella. Throat and tube white.

Aster patens. Shows white at base, forming a whitish eye.

Morning Glory (Ipomœa). Tube white.

Centaurea Cyanus (Batchelor's Button or Corn-flower). Base of central florets half pure white and half pure blue. This is a very interesting study; the white turns rose-color, the rose coalesces with the blue, and the whole becomes purple.

It is a common occurrence that when blue and red develop nearly simultaneously, or even in adjacent parts of the flower, that they soon blend into purple. A blue Morning Glory of a light color changes to a very light red-purple, and a dark blue one changes to a dark purple. Other instances are seen in *Symphytum officinale*, *Lathyrus maritimus* and in many of the Asters, etc. Colors are affected by the proximity of other colors; the reds in a Turk's-cap Lily, the "honey-guides" in Oxalis and the "eye" in Coreopsis, all having a yellow foundation, are not so vivid as the reds in white flowers. The honey guides in a white Snap Dragon of the gardens are light lemon-color, in *Gerardia tenuifolia* a darker yellow, in a light blue Lobelia a different tone of yellow, and in a dark blue Lobelia they are substantially green.

One exception only has been found in our wild flowers where the base apparently was not white, namely, *Myosotis palustris* (True Forget-me-not). Here the tube is clearly yellow, but the blue lobes are not attached in the usual manner, that is, on the end of the tube, making one continuous cylinder, but the tube extends above the lobes, forming a crown, while the lobes are attached a little below on the outside of the tube, giving them an exceptional character. This flower is also remarkable in color changes; the lobes of the corolla, at first white, become tinged with rose and then change to pure blue, while the tube remains yellow. Thus four colors appear in its development. It is no more difficult to believe that this yellow tube was originally white than that other whole-yellow flowers were derived from white. The blue, it will be noticed, was derived from white, and a small portion remains at the base of the lobes. In Centaurea it also should be noticed that blue appears much before red, as it does also in Ipomœa. There was discovered in an examina-

tion of *Monotropa uniflora*, in a single instance, on one of the petals, a spot of the purest cerulean blue; it was, of course, accidental and is only mentioned as showing that the color sprung from white.

Stamens.—There would seem to be no good reason why stamens should be yellow, while petals of the same flower are white, red or blue, and the general impression that they are so, as shown by the quotation near the commencement of this paper, is found to be erroneous. In an inspection of nearly all the late summer and fall flowers it was found that, with only half a dozen exceptions, the filaments corresponded in color with the petals, and that in many instances they copy the same special markings, as: St. John's-wort has a small black dot at the bottom of every serrature of the finely serrate corolla, and a similar dot on the anther of every stamen; *Gerardia tenuifolia* has its white stamens dotted with rose-colored spots similar to those of the tube; *Cassia Chamæcrista*, base of some of the stamens purple, like the base of the petals. In Buda and Cakile the stamens are merely in a less advanced state of coloration, being colorless to white, and the petals rose and purple, and in *Hibiscus Moscheutos* the stamens also are white, branching from a central column, and the corolla rose-colored; also in *Linaria vulgaris*, with corolla two shades of yellow, the stamens are white, but in Rosa and Nymphæa the stamens are found to be in an advanced state of color—that is, each has yellow stamens, while Nymphæa has white, and Rosa pink or rose petals. The writer can only suggest as an explanation of these abnormal conditions that the white of Nymphæa has been infused with the yellow color of its abundant pollen, and not changed by the usual chemical action, and that the flat position of the stamens of the Rose on a broad receptacle, allowing insects to directly alight and trample over them, may be the cause.

Pollen.—Pollen is not universally yellow: it is found of all colors from pure white, as in Polygonum Hydropiper, etc., through every shade of yellow, from cream to the reddish brown of *Lilium superbum* and the purple of Gladiolus and other plants. It is a fair inference that, next to green, the primary color, not only of petals, but of all parts of the flower, is white.

Conclusion.—1. The primary color of flowers, next to green, is white.

2. There is no regular order of progression in colors, as, for instance, that red follows yellow, or that blue follows red or was produced at a much later date, as it has been demonstrated that the principal colors, yellow, red and blue, are derived directly from white, and therefore are of equal rank, although some are more prevalent than others.

Insects probably have aided in "fixing" and determining color to some extent in certain families, but before they could be established they must have appeared; and if the quality of sunlight and the texture of the tissue of petals was the same in primitive times as now, and there is no reason to doubt it, then, in all probability, as soon as petals were formed, however remote that time may have been, all colors, including blue or purple, began to appear. Indeed, in the simplest and, presumably, the oldest types of flowers given in Gray's Manual of Botany as Clematis and Anemone, the prevailing colors are white and purple.

The rainbow and the prism reveal the many-colored rays of a beam of white light; the colorless tissue of the petal gathers up these scattered rays of the sun and forms them again, not into an intangible sunbeam, but into a material substance, shining with the original white, from which the sun calls them forth, re-habilitated in all their pristine splendor.

New Bedford, Mass. *E. Williams Hervey.*

Deciduous Shrubs with Late Persisting Leaves.

OUTSIDE of the coniferous class there are very few shrubs which are of a truly evergreen character, and, at the same time, which prove sufficiently hardy to withstand the rigor of our northern winters. It is true there are a few belonging to different genera which survive, and are always interesting, but most of them require some protection in winter, and even with protection their endurance is not to be depended upon.

In the absence of any number of thoroughly hardy evergreen species, it is of interest to note those deciduous kinds which maintain their leaves until quite late in the autumn, usually until mid-November or later. A careful review shows quite a number of these, and the foliage of several of them holds a good color through many hard frosts. With the possible exception of the Privets, no one group or genus can be called distinctly characteristic for this quality, the original home and environment of each species having influenced the period of defoliation, and the habit being perpetuated in cultivation. But abnormal garden forms often differ from the type in a very marked degree, and the foliage of young plants is often more persistent than on older ones.

A look over the shrub collection of the Arboretum on November 21st showed the following which were noticeable for still retaining many leaves after the severe frosts and high winds to which they had been subjected. The list is a comparatively short one:

The common Barberry still held a few leaves, and showed some variation among individual plants, some of the garden forms holding more than others, but none being particularly interesting. Japanese species, such as Thunberg's and Siebold's Barberries, had not retained a leaf.

Near by the little Yellow-root (*Zanthorhiza apiifolia*) of the Alleghany Mountains had hardly dropped any of its foliage, and it was still fresh and bright with its yellow and orange colors, once more enforcing the lesson that it is one of the very best of low shrubs for covering the ground.

Only one deciduous hardy Euonymus held its leaves. This is merely a monstrous form of the common European Spindle-tree, and is known in catalogues as *E. Europæus, erecta nana*. It has never been known to flower here, and as its foliage does not assume any of the bright autumn colors of its parent species it is hardly worth cultivating except as a curiosity. The leaves at this date were still a dull green color and all persisting.

Spiræa Thunbergii was still splendidly covered with its rich-colored feathery foliage, and it stood alone in all the genus, as no other species retained any quantity of leaves, and the few that remained were not conspicuous for coloring. Complaint will be made that the lower portions of the stems of *S. Thunbergii* become naked and unsightly with age, a fault common to many shrubs, but one which may be overcome by proper pruning.

Nearly all the forms of the common European Blackberry (*Rubus fruticosus*) hold their foliage in a remarkably fresh and clean condition, and with much richness of color, proving a good late covering for rough places. Our own *R. hispidus* holds its foliage even better than the European species, and, in fact, it lacks little of being an evergreen. It is a slender trailing plant, and is useful for forming a thick covering over rocks, stumps, etc. The Dewberry (*R. Canadensis*) also holds many of its leaves until quite late—later than our native Blackberry.

Of all the hardy wild Roses the little Scotch, or Burnet Rose (*Rosa spinosissima*), is by far the best when regarded from the standpoint of late foliage bearing. When all the other species are leafless, the neat compact bushes of the Scotch Rose still hold a quantity of fresh, rich-colored leaves. An exception should be made in the case of the new and rare *R. Wichuraiana*, which was figured and described in the last issue of Garden and Forest. The leaves of this plant are still all retained and are almost as bright and fresh as in midsummer, but, on account of its low trailing habit, it is not conspicuous. *Parottia Persica* holds many of its leaves, though they have lost much of their color and are becoming dry; but *Itea Virginica* is almost as fresh and brilliant as at any time during the autumn.

Several deciduous members of the Heath family are conspicuous, the best of them all being *Leucothæ racemosa*, with abundant foliage, purple and brown above, the under leaves being yellow. The Stagger-bush (*Andromeda Mariana*) still holds foliage on the ends of its branches, and *A. speciosa* has not lost any of its clear light green, yellowish, or sometimes brown and purplish leaves. The Leather-leaf (Cassandra) is fairly an evergreen here, and so does not come under the present list.

Our largest shrubby Composite (*Baccharis halimifolia*) holds enough of its fresh green leaves to effectively set off the bunches of conspicuous white pappus borne by the pistillate plant. The Indian Currant, or Coral-berry (*Symphoricarpos vulgaris*) retains all its leaves in a very fresh state, the branches being bent under the weight of the regularly abundant crop of deep red berries, and *Viburnum Lantana* retains more than any other of its genus, but it is dull and uninteresting.

The only Honeysuckles which here hold good foliage so late are *Lonicera Standishii* and *L. fragrantissima*. The first has lost fully half its foliage, which falls while yet fresh-looking; but the leaves of *L. fragrantissima* seem to retain their chlorophyll and vigor until much later. Indeed, the habit of this plant here shows that it is quite evergreen in climates a little less rigorous than this.

The rich green-clad climbing Japanese Honeysuckle (*L. Japonica*) and Hall's variety of it are certain to attract atten-

tion, but it comes under the head of evergreen rather than late deciduous shrubs.

Nearly all the Privets are admirable for the late persisting quality of their foliage, the only exceptions in the Arboretum collection being *Ligustrum Ibota*, which is leafless, and the closely related plant called *L. Amurense*, which only retains tufts of foliage on the ends of the more vigorous shoots.

The true *Forsythia Viridissima* is often conspicuous by holding its leaves late. *Elæagnus angustifolia* and *E. umbellata* and the Hippophaës retain a large quantity of fresh-looking leaves of no particular interest or ornamental value.

Finally, the fine leafy condition of *Smilax glauca* seems to show that it is at this season superior to the common Greenbrier (*S. rotundifolia*) and to *S. Pseudo-China*, which have very few leaves left among their tangle of prickly stems.

Arnold Arboretum. *J. G. Jack.*

Fig 91.—Hypericum Buckleyi.

New or Little-known Plants.

Hypericum Buckleyi.

THIS pretty and delicate Hypericum, of which a figure appears on this page, is one of the rarest of the North American species, it being known only on a few of the higher mountains of the Carolinas and Georgia, where it was first noticed many years ago by the botanist whose name it bears. It is a wide-branched plant with slender stems from eight to twelve inches long and covered with loose reddish bark. The leaves are oblong-obovate, from a half to two and a half inches long, rounded at the apex, gradually narrowed at the base, bright green on the upper surface and pale on the lower. The flowers, which are solitary and terminal, are borne on long slender bracteate pedicels; they are an inch across, with obovate sepals, bright yellow striated strap-shaped petals more or less rounded or acuminate at the apex, united styles and three-celled ovaries.

Hypericum Buckleyi was sent to the Arnold Arboretum in November, 1889, by Mr. F. H. Boynton, of Highlands, North Carolina, and flowered profusely here this year in the open ground at the end of June. Nearly all the American Hypericums are desirable garden-plants; most of the species are very hardy, their habit is good, and they usually produce their showy flowers at midsummer. *Hypericum Buckleyi* promises to be a good addition to a not very long list of small, handsome-flowered, and easily grown hardy shrubs, suitable for small rockeries or the margins of small shrubberies.

Our illustration is taken from a drawing made by Mr. Faxon from a cultivated plant.

C. S. S.

Foreign Correspondence.

London Letter.

Bordeaux Mixture for Potatoes.—A fortnight ago I sent you some particulars of a trial of this mixture as a preventive to disease in Potatoes by Messrs. Sutton & Sons, of Reading, the result of which was most unfavorable to the mixture. Dr. C. B. Plowright, the eminent fungologist, now reports a trial of Bordeaux mixture on Potatoes which shows an immense gain in the yield of the dressed Potatoes as compared with those which were not dressed. The experiment was made in Donaghmore, Tyrone, only Champion Potatoes being tried. They were grown upon two different farms, the treated and untreated plants grew side by side, and were identical as to seed, manure, cultivation, etc. The mixture used was 32 lbs. copper sulphate, 16 lbs. lime, and 160 galls. water. It was applied by an Eclair Knapsack pump, price thirty-five shillings; the cost, including labor, being about ten shillings per acre. The leaves of the untreated plots were destroyed by August 21st, but the foliage of the dressed plots was quite green for nearly a month longer. The total yield from the plots treated with the mixture was 78 tons 14 cwts., while from a similar number of plots which were not treated the yield was 66 tons 13 cwts. The difference per acre was between one and a half and two tons in favor of the treated plots. This experiment certainly proves that in this particular case the application of the fungicide to plots of Champion Potato made a considerable improvement in the yield. But there are good reasons for believing that, under other conditions of climate and soil, the same Potato would have behaved quite differently, and, possibly, would even have proved better without the mixture. Further experiment is necessary before any definite opinion as to the value of the mixture as a fungicide for Potatoes can be reached.

[Experiments carried on for some years in this country seem to show that spraying Potato-plants with the Bordeaux mixture hinders the spread of the rot by preventing the germination of spores which are carried by the wind from infected to healthy plants.—Ed.]

Cypripedium insigne, var. Sanderæ.—According to a paragraph in *The Times* a plant of this Cypripedium has lately been purchased by Messrs. F. Sander & Co. for £250. The history of this variety is as follows: It was introduced by the St. Albans nurserymen in 1888 among a batch of *C.*

insigne, only one plant of the variety being found. When it flowered it was named by Mr. Sander in compliment to his wife. It was afterward divided into two, one of which was disposed of by auction for £70, Baron Shrœder being the purchaser; the other was sold to Mr. R. H. Measures, whose collection of Cypripediums is famous for its richness and splendid condition. Mr. Measures divided his plant into four, one of which was sold to F. L. Ames, Esq., of New York, one to Mr. R. J. Measures, and the third is that for which Messrs. Sander & Co. have paid £250. At this rate the single plant introduced three years ago has now a value of £2,000; at any rate, one-eighth of it has been sold for an eighth of that sum. Of course, the plant has this value only to collectors of Cypripediums.

Dendrobium formosum giganteum.—This is a most attractive Orchid at this time of year. Several very large importations of it were made last year and the year before, consequently the plant is abundantly represented in collections here now. Plants one and a half feet high, with stout leafy pseudo-bulbs bearing terminal clusters of from three to five flowers, each fully four inches across and suggestive in form of a Cattleya. They are pure white, with a blotch of deep yellow on the curiously plated lip. They remain fresh on the plant about a month. This species is abundant in north-east India and Burma, and as it travels well it is always plentiful and cheap in England. Its one drawback is its failing in health after about two years' cultivation. Still it is by far the largest and most beautiful of all white-flowered Dendrobiums, and it never fails to flower freely the first year after importation.

New Roses of 1891.—A writer in the *Gardeners' Magazine* calls attention to the following new kinds of Roses as being the best this year:

Margaret Dickson (Hybrid Perpetual) was sent out by Messrs. A. Dickson & Sons, who last year obtained a gold medal for it. Messrs. Dickson describe it as follows: "White, with pale flesh centre, petals very large, shell-shape, and of immense substance, magnificent form, growth very vigorous and covered with stout spines, foliage very large and dark green in color. Unquestionably the greatest acquisition made to Roses during the past ten years." This is a little too much to say of a Rose which has had only a year's trial, although at the National Rose Society's Exhibition it was awarded first prize for a stand of twelve flowers of a new Rose, as well as first for a stand of twelve white Roses.

Salamander (Hybrid Perpetual). "Flowers bright scarlet-crimson; very vivid in summer and deep and glowing in autumn; large and full outer petals reflexed, centre erect; free-blooming, strong in growth, constitution good." This is another gold-medal variety raised by Messrs. W. Paul & Son, with whom it was in fine condition in August.

Marchioness of Dufferin (Hybrid Perpetual). The raisers, Messrs. A. Dickson & Sons, describe this as "a worthy partner of our Earl Dufferin, which has attained a world-wide celebrity as the best dark Rose introduced since 1869. The flowers are of enormous size, their color a beautiful rosy pink, suffused with yellow at the base of the petals, which are reflexed. The growth is vigorous." This Rose was highly commended at the National Rose Society's Exhibition, held in London, and afterward obtained the gold medal when exhibited before the same society in Hereford. It is distinct in color, being almost lilac, and it is excellent in form and size.

Crimson Queen (Hybrid Perpetual). This is a most beautiful Rose, which I saw among Messrs. W. Paul & Son's flowers at the Temple Show. It has velvety flowers, colored maroon, shaded with fiery red in the centre; very large, full; globular in form. The plant is said to be very vigorous and to produce abundant and large flowers equally well out-of-doors and under glass. It will probably prove a good early variety.

Waban (Tea). This is of American origin, and is a sport from Catherine Mermet. It is described as resembling its parent in foliage and growth. The flowers are carmine-pink, splashed with madder-red, the reflexed petals more delicate in color. Roughly it may be called a deep-colored Catherine Mermet. It is being distributed in England by Messrs. W. Paul & Son, who have a very high opinion of it as a Tea Rose.

Medea (Tea). Raised by Messrs. W. Paul & Son, who describe it as having "flowers lemon color, canary-yellow in the centre; clear and bright shades of color; large in size; very full; buds inclined to be high-centred, but expanded flowers more globular; growth vigorous; a grand tea-scented Rose."

Mrs. Paul, another of Messrs. W. Paul & Son's new varieties, a Bourbon, is also spoken of very highly.

Kew. *W. Watson.*

Cultural Department.

Apples in 1891.—II.

Winter Apples.—Belmont is one of the early winter fruits that ought to be more generally grown. It is most popular in Michigan, is of fine quality and a very handsome blush yellow. It is often called Waxen, from its oily skin. It grows rapidly and bears heavily. The wood of the tree is brittle. Baldwin is too well known to need any description. It varies immensely on stock and with soils, and is best when grown on old trees grafted high. Spitzenburg is really the best of apples for cooking. For a time it was argued that the Spitzenburg had run out, and could no longer be grown; but if the fruit is syringed against codlin moth and the bark washed with kerosene emulsion, it will thrive, but it needs rich soil or high feeding. Hubbardston is a superb apple in December. In January it begins to lose its spicy flavor. It is a beautiful apple and borne here in abundance. Young trees often overbear. The wood is rather brittle. This year a tree of this variety in fruit has presented an appearance truly splendid.

Grimes' Golden is a fairly good apple of medium size and bears well. It does not rank as high here as in the west, but for vigorous growth and health the tree is admirable, and every orchard should have a few. Jonathan is an apple of the very first quality. It is a seedling of Spitzenburg, deep red in color and strikingly handsome. It bears enormously. Northern Spy is a superb fruit, and is almost a universal favorite. Throughout the whole Apple-belt, from the Atlantic to the Pacific, it does well. To be at its best it should grow on very open trees and in strong soil. When ripened in the shade this apple is flavorless. It is now our most profitable apple for general culture; this year, however, for some reason, the fruit is not high-colored. Rhode Island Greening is a long name, but we must retain it, as there are several Greenings in our orchards. It is not easy to get the genuine Rhode Island Greening, which is yellow fleshed and very rich-flavored. Eatable in December, the Greening is in good condition and high quality until April. Roxbury Russet is among the ten best Apples here. It bears admirably, the trees are very enduring, and for baking no late winter apple surpasses it. The tree is inclined to bear early, and to grow low and spreading. It is a favorite of the codlin moth, and the fruit is specially relished by fowl and cattle. Princess Louise, a seedling of Fameuse, is a handsome, delicious fruit, with flesh white, and a flavor much like its parent. It is beyond price, and very hardy. The Newtown Pippin, Peck's Pleasant and Canada Red are local fruits, and so, practically, is the Tompkins County King. This last never gives full crops outside a few favored localities unless syringed, and even then the crop is too largely defective. Swaar is an old English sort of extraordinary quality, a large, handsome fruit; and the tree is hardy, but not a first-class grower. Westfield Seek-no-farther has done as well as ever, and always does well, giving large clean fruit, handsome and very excellent for table use. Yellow Bellflower has done but poorly in this section, and generally in the east, but in the west is a prime favorite. It is specially in need of syringing. The Kirkland, a seedling from the Bellflower, is a grand acquisition, for a very large, very showy and very late keeper. Wagner I do not place low in the list because of its inferior quality. It is one of our very best; and for table-use in late winter is invaluable. For my personal preference I place together Greening, Jonathan and Wagner for late winter. It is a northern Apple, and will probably fail in the south.

Sweet Apples.—For summer I have named the old Harvest Bough, or Sweet Bough. For early winter, the Pound Sweet, grown as it should be on open trees, is the best. It is growing in favor again, after being displaced in part by Tolman's. It

gives enormous crops of fine large fruit. Properly handled it keeps till April. The best late sweet that I have yet seen is the Belle Bonne, an old Connecticut fruit, that does well here, and almost everywhere. A fine tree, early to bear, and a grand cropper of clear golden apples, and a fruit of delicious quality for table or baking that keeps till May. I have found a seedling sweet which seems the handsomest and best of all, but the tree is a poor grower, and apparently diseased. I am trying kerosene emulsion with some advantage.

No well-instructed apple-grower will hereafter attempt to raise this fruit without spraying against the codlin moth. Unless we use the well-tested remedies against insects and fungi our orchards will be simply nuisances. We have also to comprehend that no fruit needs more care in handling, and no tree more good feeding and careful pruning. Apples can no longer be successfully grown without brains.

Clinton, N. Y. *E. P. Powell.*

A Few Good Flowering Plants.

HEDYCHIUM CORONARIUM.—This is an admirable plant for decorating conservatories, and when planted out in rich compost and well supplied with water is seldom out of bloom, the pure white flowers being produced in terminal spikes after the companion plant to the last, the flowers being tubular in form and bright yellow in color. The foliage is smoother than that of *C. elegans*. *C. fasciculatum* and *C. Newelli* are also worth cultivating, the first bearing some resemblance to *C. elegans*, while the latter produces larger flowers of bright crimson color. All the members of this genus are readily increased by cuttings from the young growth, but for conservatory decoration old plants that have been cut back are preferable, as they usually produce a better crop of flowers, although they require some stimulating with liquid manure to develop their best form.

BEGONIA INCARNATA.—This is a very useful species of this useful genus, and is specially adapted for pot-grown specimens for winter flowers. It is possibly better known as *B. insignis*, and bears a profusion of large light pink flowers during the whole winter. The color of this Begonia is a very pleasing one. A few plants of it dotted about a conservatory are extremely effective, and it is a beautiful plant for any indoor decoration. *B. Froebeli* is another remarkably handsome species, but is not quite so easy to manage as the preceding. It has large cordate light green leaves that are more or less covered with dark hairs, which are more noticeable on the young foliage. The flower-spikes are quite strong

Fig. 92.—The Körner Oak, near Carlsbad.—See page 586.

manner of the Cannas, but possessing the additional advantage of being very fragrant. Under favorable conditions the plant will attain a height of six to seven feet, and soon forms a large clump of growths. *H. Gardnerianum* is another handsome member of this family, of somewhat smaller growth than the preceding, and with light yellow flowers. This species is somewhat more hardy than *H. coronarium*, and may be used to advantage out-of-doors in the summer. It is propagated by division of the roots, which is most satisfactorily performed in the spring.

CESTRUMS.—These rather old-fashioned greenhouse shrubs are seldom seen now, though quite useful for cool-house decoration, and not to be despised as cut flowers. *C. elegans* is one of the best, and, in common with its fellows, has simple leaves of more or less lanceolate outline. Its growth is rapid, so that it needs to be pinched occasionally in order to make a shapely plant. The flowers of *C. elegans* are purplish red, and produced in small terminal clusters. *C. aurantiacum* is a good on well-grown plants, and bear a considerable number of large brilliant scarlet flowers. This Begonia prefers a light soil, well enriched with dry cow-manure, and in watering it is best to avoid wetting the foliage, as this species is rather impatient of moisture on the leaves.

PRIMULAS.—The Chinese Primroses especially are among the most useful small-growing plants for winter-flowering either in the dwelling-house or in the conservatory, and a succession of young plants should be provided each season for such use. They should be coming into bloom about this time in order to be most valuable. *P. Japonica* is also a showy plant, though quite variable in color, and may be had in bloom during the winter and spring months with but little difficulty. The flowers are about one inch in diameter, produced in successive whorls on a stout spike, the prevailing colors being shades of crimson and red. *P. verticillata* is another very pretty species of this extensive genus, and does not seem to have become common, though in cultivation for

many years. It has long lanceolate leaves that are covered with a white powder, and the flowers are quite large, yellow, and produced in whorls on a scape. This species does not relish much water over its foliage, and its beauty fully repays for any care required in its cultivation.

Holmesburg, Pa. *W. H. Taplin.*

A November Garden.

IT ought to be possible to make our gardens more interesting in November. Of course, this is the time of Chrysanthemums, which are apt to overshadow other things. But, however much one may value their useful flowers, it is well to have a few quiet plants in the garden as a relief from their rather dazzling prominence. A well-filled garden should have something of interest at all seasons, if it serve no other purpose than to draw us more to the open air. Many of us have managed to stock our gardens with plants which respond to the first indication of warmth, but most of us have relied on the Chrysanthemums to give us our latest pleasures in the open.

My list of small plants has been lengthening, and they are gradually giving me suggestions which I hope to utilize in the future for providing quiet dainty bits in the border to be enjoyed till the final closing of the garden-year, usually about the first of December in this latitude. Of course, there are few flowers to be had out-of-doors in November. An occasional Primrose opens, *Bellis perennis* is not easily discouraged, the Globe-flower, *Trollius Europus*, gives a few blooms, and, showiest of all, the Marigolds, if in a warm corner, may be depended on for stray flowers.

The flowers in the November garden must, however, be had mostly from bulbs—the Crocus and Colchicum. The autumnal Crocuses pleased me so much this year that I have an idea of trying for a bright autumnal effect in a border planted also with spring-blooming bulbs. There is a long stretch of time after such a bed is cleared and planted when, to say the least, it is not attractive. It has occurred to me that if, with the spring-flowering bulbs, we planted an assortment of autumnal Colchicums and Crocus, the bed could be made to do double duty and be attractive quite through the month of November. It might be necessary to provide temporary shelter for occasional very hard weather, but these flowers will stand a fair amount of severity. The available varieties, both of autumnal Crocus and Colchicum, are numerous, and they vary considerably the time of blooming, so that it would not be specially difficult to arrange for such an effect.

But any one who is really fond of plants finds that flowers are only one of the elements of beauty; and at this season one finds dainty bits to enjoy among the small hardy plants which, in the presence of luxurious summer growth, are too frequently overlooked. There is a never-failing fascination in some of the little alpine plants. The encrusted Saxifrages are really jewels, with their attractive rosettes, and always enjoyable even when not in flower. The mossy Saxifrages, also, may be had in never-ending variety, and when established are mostly gems. The low-growing Sedums are another family among which may be found numerous attractive plants. Some of them take on wonderful tints of coloring at times. Mr. Whittall sent me some Cyclamens from Asia Minor, whose leaves are so beautifully marked, and which are so very hardy, that they are even yet attractive. This has induced me to plant other available kinds, of which I find there are about a dozen. In slightly shaded places and well-drained soil I shall probably find a fair number successful. The present plants are as attractive to me as my favorite greenhouse varieties.

There are, of course, numerous other small things—Androsaces, Drabas, Arabis, etc.—which will gladden the gardener when well established. Small things are these, and many of them require much skill and care. One who gardens for pleasure does not consider them troublesome, and they are never tiresome. Some plants are like a mathematical demonstration, they go on in orderly reliable sequence. There is pleasure in the demonstration, and pleasure, too, in such plants, but seldom so much as in those which require more attention. At this time will often be observed the first signs of the spring harvest—the Muscaris have their foliage developed; in few Narcissus the tips are just evident; the foliage of Spanish and a few other Irises is appearing; and many interesting things may be noted in the borders. I do not share the fear of some that early developed foliage will suffer by hard frosts and cover nothing except the Oncocyclus Irises. Such foliage is usually developed slowly under hard conditions and is not readily injured. A slight covering of leaves, such as nature and kind winds scatter over the beds, is not objectionable and serves a useful purpose in preventing sudden thaws; but in my case, like that of many others, the demon of tidiness and destruction in the way of the occasional helper, usually carefully removes such evidences of apparent unthrift before one thinks to give warning. The same sometimes useful person also enjoys raking out the crowns of one's favorite plants unless restrained by a strong hand, and I am afraid he is not the only one who thinks a bare patch of earth an ideal fall and winter garden.

Elizabeth, N. J. *J. N. Gerard.*

Bacterial Disease of Celery.—There is a bacterial disease of nearly everything, and Celery proves to be no exception to the rule. About a month ago, while in the Celery-fields, near Greenville and Bayonne, New Jersey, looking after troubles of a fungous nature among the truckers, attention was attracted to a peculiar blight of Celery, particularly the variety known as the Golden Plume. The affected leaves were badly blotched with brown, the diseased spots having a watery appearance that suggested the work of nematode worms as much as that of bacteria. A microscopic examination of the infested leaves showed that, while nematodes and all forms of filamentous fungi were absent, there was an abundance of bacteria uniformly in all the diseased patches. It was an easy matter to secure these germs free from all others and grow them for purposes of inoculation. Leaves of Celery from healthy plants were then treated to the pure germs, and at the end of three days the disease had spread throughout their whole extent. From these decayed specimens the bacteria were again transferred to the cores of plants, and from these tender centres the disease spread with still greater rapidity, and the whole plant became decayed and worthless.

In these experiments it was determined that the bacterial decay proceeds most rapidly when the part of the Celery is kept constantly moist, but not wet. Celery-stalks placed partly under water, to which bacteria had been added, decayed quickly near the water's surface, and the submerged portions were the last to spoil. The practical lesson from this, so far as our limited knowledge suggests any lesson, is: Keep the Celery dry and cool as possible.

Rutgers College. *Byron D. Halsted.*

Prolonging the Fruit Season.—A curious fact in Pear-culture, and indeed in fruit-culture generally, is, that if the bulk of the crop is picked when ripening, and a portion of it, say a fourth or less, is left on the tree, the latter will cease to ripen and will remain on the tree in good order for a month longer. I picked some fine solid Buffum pears that were left on the tree a full month later than the main crop, which was gathered September 20th. The most perishable Plums, such as Washington, will behave in the same way. Nature provides in some fruits for a long succession by loosening the ripe ones from the stem. This is peculiarly true of the Gravenstein and Summer Strawberry apples; but it is often worth our while to follow Nature, and secure a long season of some favorite fruit.

Morristown, N. J. *M.*

The Subjection of Torrents by Reforestation of Mountains.

IN March of this year, before a special session of the French Association for the Advancement of Science, there was presented a paper so suggestive in connection with efforts now being made to arrest needless forest-destruction in our country, that we reproduce the essential parts of it in translation, kindly furnished by Mr. H. B. Ayres. It was from no less an authority than M. P. Demontzey, Forest Administrator of France, to whose indefatigable work for the last twenty-five years or more is due the success in redeeming the devastated mountain regions of southern France.

The author's vivid descriptions of experiences in the mountains of France remind us of the damaging and dangerous floods and erosions not only in the scantily wooded regions of the west, but also in portions of the eastern states, especially in the sandy regions of the south.

It was in France that the reforestation of mountains was first made the object of legislation. A long time ago, numerous statesmen, economists, engineers and woodsmen, far-sighted and impartial observers, acquainted by long residence there with the mountainous regions of southern France, warned the state of disaster and ruin, and unanimously urged

the necessity of modifying a condition that formed a singular contrast with the prosperity of other regions and threatened to compromise them also.

The government was apathetic, and, heedless of danger, continued to ignore a matter which seemed to interest only some poor districts crying faintly in their distress. But, at length, the disastrous inundations of 1840 brought from the lower Alps another cry of alarm that suddenly aroused public opinion.

A young engineer, Surrell, originally from the most densely forested district of Lorraine, published, under the guidance of Dufaure, then Minister of Public Works, his "Etude sur les Torrents des Hautes-Alpes." This masterly work was characterized by the most thorough analysis, the clearest observations, the most definite conclusions and the most advanced ideas of economy. It was the grandest plea ever uttered in favor of mountain-forests, and was awarded a Montyon prize by the Institute in 1842.

From that time the reforestation of mountains has taken rank among matters of high public interest in France; the government brought this important question to the attention of the general councils of many interested Departments, and the Forest-administration, while preparing a code of law, began in 1846 a series of experiments in reforestation, the results of which have not ceased to be of value. Political events caused a long delay, and it was not until 1860 that a permit for experimentation was granted. This was the first law looking toward the reforestation of mountains, and it was the result of aroused public opinion after the inundations of 1856, the losses by which have been estimated at more than 250,000,000 francs. There were clamorous politicians who maintained that reforestation of mountains was a chimerical and impracticable enterprise, which would only lead to disappointment. But the government was gaining knowledge from the experiments, and by 1876 it was able to lay before Parliament a new plan, which, after many debates, resulted in the law of April, 1882, for the Restoration and Preservation of Mountain Lands, in full force to-day.

The provisions of this law are of two classes: (1) Measures of encouragement, which consist in the power given the government to incite, by means of bounties, landed proprietors, communities and private citizens to improve lands hitherto unproductive, desolate and liable to erosion. (2) Measures of coercion, which authorize the state to demand the declaration of the public need of works termed "obligatory" at all points where a careful investigation shows that their execution is demanded by deterioration of the soil and real dangers.

If we investigate the causes of deterioration we find that the great enemy, in fact the only one that we have to combat, is erosion, the power of which is determined by the inclination of the slopes, the volume of water that may flow in a given time, and the friability of the soil or of the underlying rock. The maximum effect is accomplished by a torrent—that is to say, a stream of water with very steep beds and sometimes intermittent—conditions which give the greatest power to erode and transport from the mountains the materials which the stream deposits in the valley. This notable characteristic of the torrent helps to make the floods in the plains still more resistless by the enormous mass of solid material, which, washed into the rivers, increases the volume of their flood and constantly elevates their bed.

The problem of restoring and preserving mountain-lands must necessarily be stated thus: On one hand to suppress in existing torrents the possibility of erosion, and the consequent transportation of material, and to diminish the volume and the suddenness of floods—that is to say, to transform the torrents into harmless and even beneficial streams; on the other hand, to anticipate or to prevent all erosion which may give rise to either the formation of new, or to the renewed activity of extinct torrents.

Such a delicate enterprise should, therefore, not be left to the discretion of the owners of the soil, but should be carried on by some agency of wider authority. Hence these obligatory reforestations prescribed by the law, which gives to the state, in case of the refusal, the negligence, or the inability of the private owner, the duty of preparing for the formidable struggle, which it alone will be able to carry on with success. Upon the state, therefore, devolves the restoration of torrent-worn mountains.

It was estimated in 1860 that the area of denuded mountains needing reforestation would reach 2,964,000 acres. After the extensive surveys from 1884 to 1886, covering 8,645,000 acres, the total area to be placed under management by the state was fixed at about 790,400 acres, or a fourth of the whole area to be reforested. The operations upon the lands most needing them, however, will cost more than the reforestation of the three other fourths, which are to remain in the hands of their present owners and be made valuable by means of the state bounties.

Before going too far, it may be well to define clearly certain terms of our special vocabulary:

We say of a torrent that it is "in activity" when it erodes near its sources, deposits material of all sorts in the valley, and spreads out over its deposits.

We call a torrent "extinct," which, after a period of activity (be it long or short), becomes, owing to special circumstances, no longer able to transport eroded material, but has longer periods of high water, rising less suddenly and in diminished volume, so that it passes into the condition of a brook.

By "correction of a torrent," we mean the construction of certain works which give stability to beds and banks in order to arrest or to diminish the transportation of materials and to reduce the rapidity of drainage.

Finally, we distinguish among "active" torrents two different modes of action, according to the nature of their floods. In case the volume of water is greater than the volume of the materials it carries, the latter stop one after the other, as their resistance exceeds the transporting power. The coarser are left first on steep slopes, then pebbles, gravels and sands, as the grades grow less and less, the change of grade being well shown by the upward concavity of the profile of their beds. On the other hand, in the case of violent and sudden torrents, from the rapid melting of snow, or a hail-storm, where the volume of materials is much in excess of the volume of water (perhaps double or triple), the current may be seen in the form of mud more or less thick, in which rocky materials of all dimensions nearly touch, and which on very steep slopes are borne onward en masse. When this current flows into the valley, no longer confined between high banks, and reaching more gentle slopes, it slackens. But the larger rocks, by virtue of their acquired velocity, are less inclined to stop, and the deposition of material is in this case in exactly the reverse order of that by selection in regular floods.

The very characteristic name of washes, or washouts, is given to these strange floods which sometimes cross the river to which the torrent is tributary, dam it for the moment and leave on the opposite bank great fragments of their advance-guard, which remain for years in testimony of the violence with which they have been swept along.

The field of action affected by the forester covers in great part three mountain systems in the south of France: The Alps, the Cévennes and the Pyrenees.

I.—THE FRENCH ALPS.

The group of the French Alps presents all possible forms of erosions, washings, land-slides and other devastations that the torrent is able to produce in the most diverse climates, and at various altitudes from the sea up to perpetual snow. This is the classic land of torrents, which there rule as terrible masters, to accomplish what Michelet strikingly called "la mort de la montagne."

In 1846 the illustrious economist, Blanqui, in a report to the Academy of Science, by which he had been charged with a special study of the situation in the French Alps, made a startling representation, from which I make some extracts.

"One who descends from Dauphiny toward Provence, along the summit of the Alps, is delayed at every step by the wild irregularities of the mountains. In nearly a hundred leagues he does not find a single navigable stream, not one of those great basins, like those of the Marne, the Saone, or the Yonne, which give life to whole provinces. The rivers of the Alps partake of the character of torrents, by reason of their rapid descent and their capricious course over a bed obstructed by rounded stones. Such are the Drac, the Romanche and the Durance, into which are discharged, through innumerable affluents, the melted snows from the perpetual glacial reservoirs, and the rains of all the upper region.

"The Rhone receives, in the lower part of its course, the astonishing product of these great floods which have acquired, in these later years, such alarming proportions.

"The bright clear skies of the Alps of Embrun, of Barcelonette, and of Digne remain, during entire months, free from the least cloud, and engender long droughts only broken by storms as violent as those of the tropics. The soil, deprived of herbs and trees by pasturing and by clearing, and dried by a burning heat, is washed quickly to the bottom of the valleys, sometimes in the form of lava—black, yellow, or reddish—followed by streams of pebbles and even by enormous rocks, which bound impetuously on with horrible crashing and destruction.

"From an elevated point the picture of this torrent-scoured country is that of desolation and of death. Immense beds of rounded pebbles, many yards deep, cover great areas, surrounding, and even covering to the top, the largest trees, and making a hopeless desolation of the farm land. There is nothing more depressing than the sight of these deep cuts, from which the mountains seem to have rushed out upon the plain to cover it over with rocks.

"The débris of these torrents can be seen a great way off, spread out at the mouth of the gorges, in the shape of a great fan, sometimes to the width of 3,000 yards, higher at the centre and inclined toward the edges like a mantle of rock over all the country. Such is their appearance when they are dry, but human language has no words to describe them at the moment of a sudden flood, when they break out with unrestrained violence which has no parallel in the ordinary behavior of river waters. Sometimes the unchained torrent strikes a river at right angles and forcibly rolls it back toward its source; elsewhere, two torrents, from opposite slopes, rush together in the middle of the river between them and assail each other with rock and gravel.

"The district is pastoral in the higher portions, and slightly cultivated in the valleys. Forests are rare, and, unfortunately, belong to the community. Their product is almost nothing. The expense of protection is beyond the local revenues, and the inhabitants vie with each other in destroying what is public property.

"The road system in the Alps is exposed not merely to the elements of destruction common to other parts of the country. The road engineers in the Alps are always ready for war; in winter, to open the road; in the spring, to repair it; in the summer, to guard against torrents. A warm wind, which suddenly melts the snows, a storm accompanied by pouring rains, a flock of goats or sheep which start a shower of stones, an avalanche which tumbles across the path, is sufficient to block all travel. The abrupt and often precipitous nature of the land leaves no escape from dangerous grades, and often compels the engineers to suspend the road over dizzy precipices. Works of engineering art are seen at every step, in the form of bridges, dams, embankments, or tunnels. Notwithstanding these constant efforts, travel is often arrested, and but few months pass without some tragic accident to spread alarm and terror among the hearts of the people."

Twenty years later, following the investigation of 1866, the Councillor of State, charged with the study of south-eastern France, in his report, prepared in 1868, described the Department of the Lower Alps as follows:

"What impresses one first in traversing the mountainous parts of the department of the Lower Alps is the imposing, but sad and desolate aspect which they present. Instead of the great forests or green pastures, which, according to local traditions, once covered them, they only show bald summits, arid slopes where a little brush still retains the scanty vegetable mold which the waters have not washed away, and deep ravines, where the torrents have rolled enormous avalanches of rocks and gravel. Here and there, as if lost in the devastation, upon heights or on slopes, apparently inaccessible, one sees a few poor dwellings; some abandoned, others, poverty-stricken relics of some industry which had managed to survive the land-slides brought on by ignorant clearing.

"At intervals, one comes upon villages surrounded by small estates that a rude population have laboriously created, and still more laboriously defended against the storms, torrents and avalanches which threaten our French Alps. Then, far apart, appear a few meadows, wooded hill-sides, or plateaus of good pasturage, whose slight inclination has saved them from the prevalent ruin. These are the oases of these immense wastes, and about them slowly, but incessantly, goes on the work of impoverishment which began more than a century ago.

"Every year the coat of vegetable mold, which has clothed the heights, is torn and diminished more and more. Every year the gravelly bed of the torrent is enlarged, and its débris encroaches upon the fertile plains of the river valleys. Every year some poor family sees its modest patrimony reduced, and it is small wonder if a population, with its means of subsistence ceaselessly threatened, becomes discouraged and emigrates to more hospitable regions. The ruinous condition of our frontier Alps produces the same painful impression upon all who see it. Every one is impressed with the necessity of making a vigorous struggle against these causes of impoverishment and depopulation."

Statistics furnish mournful information in this respect: In 1846 the population in the Department of the Lower Alps reached 156,675; in 1886 it was only 128,295. This shows a loss in forty years of 28,380 inhabitants, or eighteen out of every hundred. The population to-day is not more than 18.45 per square kilometer (247 acres), and there are districts like Barcelonette where it is reduced to 12.75 over an area of 1,716,800 acres. More than one-third of the land consists of abandoned fields and worn-out pastures.

Besides these districts, where formidable torrents develop into their highest activity, there are many other regions in which torrents of the first rank give place to myriads of smaller ones, which cover the hill-sides like a leprosy, and although their ravages appeal less strikingly to the imagination, they are quite as disastrous to the country.

The recent inundations, which caused in the lower valleys of Isère and of Durance a damage of thirty million francs, prove this only too well. Later rains only affected the lower part of the mountain-sides, and, fortunately, gave place to heavy snows in the higher part, but this only gives cause for apprehending a more sweeping destruction in the future. A rise of two or three degrees in the general temperature of the higher regions, a warm wind like the Foehn of Switzerland or the "Chinook" of North America, would melt the snow or change it to rain, and would more than triple the volume of water.

(To be continued.)

Correspondence.

The Körner Oak.

To the Editor of Garden and Forest:

Sir,—In my Garden and Forest of August 19th I read a brief notice of the great "Wurtemberg Linden." This notice had already attracted the attention of a gentleman now here, General W. J. Palmer, President of the Rio Grande Western Railroad, whose interest in the preservation of forests led to the recent withdrawal from sale and impending destruction of some 90,000 acres of woodland around the beautiful Rocky Mountain watering-place, Manitou. Our conversation about the Linden led to the discovery that one of Germany's celebrated trees, the Körner Oak, was but two miles from Carlsbad, and soon thereafter we visited it and made the enclosed measurements and photograph (see page 583).

The tree is 27 feet 10 inches in circumference six feet above the surface of the ground, 30 feet two feet above the surface, and by approximate triangulation is 75 feet high. One of the larger branches has recently fallen, and the giant evidently feels the weight of years. It is the largest of a group of primeval oaks that adorns the park of Herr Von Riegel, a gentleman connected by marriage with well-known New York families, and stands near his country-seat on the left bank of the Eiger.* It spreads its roots through the rich soil but a few hundred feet above the seams of brown coal, from which German students of fossil plants have drawn such an abundant harvest of specimens. From an inspection of the foliage I believe it to be *Q. pedunculata.*

It is widely, in Germany, known as the Körner Oak, and a tablet bearing the name of that "hero of the lyre and sword" is attached to its bole. The poet occasionally visited Carlsbad during his brief but remarkable career. He studied at the mining academy in Freiberg, and was familiar with the silver-bearing mountains that rise in rough serrations north of the Eiger on the Saxon horizon. His last visit to the neighborhood was in 1813, a few months before his tragic death. Beneath this Oak he is said to have composed his poem ending,

Deutsches Volk du herrlichstes vor allen,
Deine Eichen steh'n du bist gefallen!

In that admirable combination of scientific exactness and pleasing art, Henry Brooks' "Typical Elms and other Trees of Massachusetts" (which is praisefully introduced to its readers by the life-long lover of plants, Oliver Wendell Holmes), I find recorded the dimensions of some New England Oaks that will give the reader of these lines a basis for comparison.

The Eliot Oak, Dedham (*Q. alba*); girth, five feet above ground, 15 feet 11 inches; height, 80 feet. The Society Oak, Charlemont village (*Q. rubra*); girth, five feet above ground, 14 feet 6 inches; height, 58 feet. The Carter Oak, Lancaster (*Q. rubra*); girth, five feet above ground, 18 feet 5 inches. The Beaman Oak, Lancaster (*Q. rubra*); girth, five feet above ground, 17 feet 8 inches; height, 70 feet.

May I suggest to the amateur photographers in each of our four and forty states, six territories and the Federal District that they would earn the gratitude of a large and increasing circle of their most intelligent fellow-citizens if they would secure for publication and preservation the portraits and dimen-

* Cuttings from the Körner Oak are growing in the gardens of Oswald Ottendorfer, at 135th St., New York.—R. H. L.

sions of such remarkable trees as still remain to bear witness to pre-Columbian times—trees that, like their feral contemporaries, the Indian, the bison and the elk, are growing more interesting as they gradually disappear into the dim domain of history and legend?

Carlsbad, September 17, 1891. *Robert H. Lamborn.*

A Precocious Chrysanthemum.

To the Editor of Garden and Forest:

Sir,—A Chrysanthemum, bought in May from a city florist as "Mrs. Andrew Carnegie," began blossoming in the open ground about the middle of July, and continued to flower in a desultory way till October. The blooms were white, with a yellowish centre, not especially fine. What should have been done with this plant? Should it have been discarded as a passing freak, or taken in hand as having useful possibilities?

Whitewater, Wis. *A. S.*

[This Chrysanthemum might possibly have proved to be a precocious one. This is not at all probable, however. It is not unusual for these plants to bloom at any time, especially if they are checked and the wood is hardened up. It is very likely that the plant in question was from a stem-cutting, and, from the description, it may have been from the early Madame Desgranges. Any check which may have arrested the growth of wood would cause the early buds to develop. Ordinarily, when a plant is full of vegetative vigor the flower-buds are abortive, and it is usually only after the plant has practically finished its growth that perfect blooms are produced.—Ed.]

The Nelumbo.

To the Editor of Garden and Forest:

Sir,—In your issue of November 25th, referring to the Nelumbo, you say "Perhaps some of the readers of Garden and Forest can tell us whether the Nelumbo is still found in Dr. Barton's station in the Delaware." I regret to say that the plant is probably not to be found there now. About four years ago, in company with Mr. William De Hart, who is familiar with the locality where the plant grew, I went to search for it, where, four or five years before, Mr. De Hart had seen the plant still growing. The place was not the river proper, but the large ditches, deep and wide, of which there are so many in "The Neck," as this part of Philadelphia is called. There was not a plant left of the many he had been accustomed to see. From a trucker who lived near by we learned that the roots had been carried away by gardeners to place in ponds at home, the last plants disappearing some two years before our visit.

Germantown, Pa. *Joseph Meehan.*

Recent Publications.

The Land of the Lingering Snow. Chronicles of a Stroller in New England from January to June. Frank Bolles. Houghton, Mifflin & Co., Boston and New York.

This little book is made up of chapters, some of which have been previously published, describing the rambles, in the neighborhood of Boston, of a man interested in all natural objects, but more especially in birds. The title of the book and the names of its chapters are particularly happy, and form a pleasing introduction to the experiences of the rambler, who goes forth to see reeds shaken by the wind, and other natural phenomena, within an easy journey of Old Cambridge, which appears to be his starting-point. He begins to wander in January, taking his latest trip the 29th of May; so that it is mostly with winter and spring landscape he has to deal, and he sets forth his experience in an agreeable way with many charming touches, but a certain monotony of tone, perhaps resulting from the fact that the book is not a connected whole but a series of separate sketches, more or less resembling each other in their general character.

The most vivid of them is the Equinoctial on the Ipswich Dunes, which is very breezy and spirited, and gives a clear impression of a wind-beaten shore and drifting sand, lashed by an angry sea, with accompaniment of whirling gulls and black ducks and some bright color in vegetation.

There is, in an account of a trip to the Waverly Oaks, the following suggestive though gloomy picture:

"At the sunset hour a strange glow permeated the mist, but it soon vanished. I left the hills and crossed the Belmont meadows. The twilight was weird. The mud of the Concord turnpike seemed unnaturally yellow; the pollard willows assumed horrid shapes; head-lights on distant engines made menacing gleams on the wet rails; the great excavations in clay beds, near the brickyards, were filled with black shadows from which rose vapors; brooks, once clear, now polluted by slaughter-houses, gave out foul clouds of mist, and, as electric lamps along the road suddenly grew into yellow balls in the fog, they showed, rising above them, crucifixes of this nineteenth century, on which are stretched the electric wires, whose messages of good or evil keep the nerves of society forever uneasy."

There are accounts of the sea in a snow-storm; of the Minute Man in a snow-drift; of views through winter sunshine that contain good and secure touches. Here is a bit of Concord, Massachusetts:

"About sunset, on Saturday, I was in a grove of venerable Red Cedars. The lower half of the trees was in shadow, the upper half in sunlight. Below, all seemed cold and dreary—the unbroken snow, the rough trunks of the trees, their sombre foliage. Above, all seemed warm and cheerful—the bright blue sky, the passing bits of white cloud, the upper branches of the Cedars glowing with golden olive-green. I sought an open ledge, where I could see from Blue Hill to Monadnock, and watched the sun sink into a bed of clouds. The after-effects of color were pronounced. Overhead, the sky was cobalt; low in the east it was pale Prussian blue; in the north it was deep orange, and in the west, silvery, with a few dark, ragged clouds shredded over it. After sunset, and just before darkness comes, colors, irrespective of the outlines of the objects to which they belong, stand out more forcibly than at any other time. This was noticeable Saturday evening. The red of a distant steeple was aggressive; so was the yellow of some tufts of dead grass, waving in the wind, and so was the russet of the dried leaves on a grove of Oaks or Beeches two miles distant. The sky at that hour was a matchless background for the copper-colored stems of the Willow-trees, the bewildering network of descending lines in an Elm's branches and twigs; and the distant rows of Maples, marching along an opposing hill-top, with the orange light of the northern sky burning through them."

An account of a night under a Pine-tree, with a great horned owl for a neighbor, is very entertaining, in the chapter called A Voyage to Heard's Island; and here, too, are some graceful descriptive passages, while throughout the book there are numerous pen-pictures that show a power of delicate and poetic observation.

There is a little too much cataloguing of birds, which appear in rather too exact numbers for artistic effect, though possibly not for the precision of the ornithologist, but in this our author is in touch with the modern microscopic idea, which will not permit a man to eat a piece of pie without telling the size and nature of it. The charm of mystical vagueness is not now a literary fashion; let us be thankful that Mr. Bolles is still permitted to employ his eye for the picturesque and his poetic feeling in such passages as the one about Chocorua "dimly present in the smoky heaven as conscience is present in the mind of man."

"The stars burned near it like altar candles. The smoke of fires rose round it like incense, the song of myriad frogs floated softly from the lakes below like the distant chanting of a choir, and the whispering of the wind in the Pines was like the moving of many lips in prayer."

There is a capital description of a swallow in the chapter called Chocorua, and much sympathy is shown everywhere for the feathered throng, with the names and habits of which Mr. Bolles is evidently familiar, so that their chirping seems everywhere audible in his landscapes, and their songs to form an orchestral accompaniment to his writing.

The country about Boston, even within a day's journey, seems to furnish much to interest this close observer, who keeps his eyes and ears open as he travels on foot or by train among the hills and marshes of his neighborhood. It is interesting to see how an enthusiasm for our immediate surroundings is developing in the youth of this observant age, and how they are learning to love their own dells and fens, and to honor them in song and story. Whatever opens the eye to the beauty about us is of value; whatever calls attention to the often unheeded charm of familiar surroundings is of distinct service, and this service Mr. Bolles has rendered in his carefully written pages. It is a book to be enjoyed as it was written, in detached chapters, when the full value of each passage can be felt as it deserves. Read continuously the work loses something of its charm, which arises from truth of detail, beauty of expression and a tender sympathy with all nature. For mountains, for the depths of the forest, for the raging sea, for the bittern in the

marsh, and the wren in the orchard, he has a genuine love, which finds expression in felicitous epithet and picturesque phrase, and in an inward correspondence of feeling which interprets as well as observes the objects which attract his eye.

The paragraphs that close The Bittern's Love Song and Warbler Sunday are evidences of the meaning which he finds in common sights, and prove him to be gifted with that poetic sense which gives a value to the simplest and homeliest objects.

Notes.

During the last five years the importation of oils into India has increased eighty-seven per cent., which means that mineral oil has almost altogether supplanted the vegetable illuminants of indigenous origin upon which for ages the population had relied.

Some years ago, when Hans Christian Anderson was visiting Tennyson, he said to the poet that Ivy seemed to be his favorite plant, to which Tennyson replied, "To tell the truth it is. Ivy needs no nursing; it knows neither cold nor heat; it is the plant of immortality."

Messrs. E. H. Krelage & Son, well-known horticulturists of Haarlem, in Holland, announce the introduction of a new strain of self-colored Tulips, which they declare to be of singular excellence and which they have named Charles Darwin. It is offered in many varieties. It would be interesting to know how nearly black is the variety which is not only blacker, they claim, than any Tulip previously produced, but presents "the most absolute black in the vegetable kingdom."

The *Gardeners' Chronicle* gives the picture of a new erect-flowering Verbena which has been introduced by some of the Erfurt seed-growers. This compact new type of Verbenas is said to have branches and spikes arranged about the principal stalk in a strictly upright position. There have been introduced before this year three colors of the type, which are all various shades of scarlet or lilac. The last one is said to have a velvet-like dark blood-red color, and so nearly constant that when grown from seed but few of the plants run back to scarlet.

A specimen of *Dichorisandra musaica* in the group of greenhouse-plants exhibited by Thomas Long, gardener to A. J. Drexel, at the recent exhibition of the Pennsylvania Horticultural Society, was an excellent example of good cultivation. The plant was grown in a ten-inch pot, and formed a perfect mass of shoots from twelve to eighteen inches in height. *Phrynium variegatum*, in the same collection, was also shown in admirable condition, the variegation being very clear and distinct, while the Golden Livistona, which occupied a prominent place at one end of the table, proved how effectively this plant may be used, especially when under artificial light.

In the current number of the *Gardeners' Magazine* the new *Lilium Henryi* is figured, and the figure shows how aptly the plant has been described as a yellow-flowered *L. speciosum*. It grows between three and four feet high, and the flowers have the same reflexing, lanceolate segments and the same raised excrescences on the surface. What distinguishes the plant is its color, which is a bright and decided yellow, relieved by the bold red-brown spots near the centre. As *L. speciosum* makes a good garden Lily in this country, it is not improbable that *L. Henryi* will do the same. It was found in 1888 on the slopes of precipices at an altitude of from one thousand to two thousand feet above the sea, near the town of Ichang, in the province of Hupeh, in China.

As an effort is now being made to set apart a forest-reservation about the wonderful and beautiful Crater Lake in Oregon, it is important to note how rapidly that region is being turned into a desolation. Mr. E. W. Hammond, who was there not long ago for the first time since 1875, reports that where a forest of Firs and Spruces stood sixteen years ago, with branches sweeping the abundant grass, which was knee-high everywhere, he found the ground as bare as a public road, the whole country having been pastured to death by cattle and sheep. Hundreds of blackened trunks of once beautiful Firs and Spruces now stand by the dried-up water-courses to mark the track of fire. In the midst of this desolation stands a great log corral, which was deserted because all herbaceous vegetation had been stamped out for miles around. Of course, it would be well if the entire region about the lake should be put under proper control, but the immediate approaches to it, at least, should be preserved from such vandalism.

Mr. John Thorpe, Chief of the Division of Floriculture in the Columbian Exposition, has been in this city on business connected with his work in Chicago. Mr. Thorpe speaks with enthusiasm of the possibilities which the great Exposition buildings and the broad grounds offer for a horticultural display which has never yet been equaled. He realizes, however, that time is crowding the work and that every moment will be needed to establish and develop the plants suitable for this colossal enterprise. It is to be hoped that the managers of the Exposition understand this point as thoroughly as Mr. Thorpe does, and that they will afford him every facility for hurrying forward the work in its earlier stages. It would be an incalculable misfortune if Mr. Thorpe were compelled to say at last: "What a magnificent exhibition I could have made if the proper support had only been given me at the proper time!" We ought to add that Mr. Thorpe himself has no fear that the enterprise will fail, in any particular, to justify the expectations of its most sanguine friends.

Mr. Edward Whittall, writing in *The Mayflower* of his recent discoveries in Asia Minor, says that a new Scilla was found on the western spurs of the Taurus in the same location where *Scilla bifolia Taurica* was said to have been discovered. This is the variety, no doubt, which has lately been named by Mr. Baker, of Kew, *S. bifolia Whittalli*. The Crocus family is largely represented in these regions, a beautiful variety strikingly like *C. Sieberi* being found on the Taurus, above the town of Adalia, the ancient Attalia. The Fritillarias have been found in great variety by Mr. Whittall. Previously he had found *F. Armena* (yellow and green), *F. aurea* and *F. acmopetalis*. This season's discovery is a Fritillary of checkered lilac and yellow, and somewhat smaller than *F. Meleagris*. It is peculiar in blooming in July, fully two months later than other sorts in these parts. The Snowdrop seems to be represented in Asia Minor only by *Galanthus Elwesi*, and this beautiful plant is found growing abundantly over all the region from the Straits of Mytelene to the heights over Samos. Mr. Whittall has heard of a yellowish variety, which, if description is true, will be welcomed by fanciers of the family.

In the private gardens of the palace at Osborne, on the Isle of Wight, where only, it is said, can Queen Victoria plant and cut and arrange as she pleases without consulting the officers of the Crown, she has a long array of memorial trees commemorating events which have occurred in her family circle. In one spot stands a row set out in February, 1862, when each member of the family dedicated a tree to the memory of Prince Albert, who had died during the preceding December, the one which the Queen herself planted being a Pine-tree. In another place is a group each of which records the marriage of one of her children, and it is under the shade of these, we are told, that Victoria prefers to have her afternoon tea-table set. Not far away is a large, luxuriant bush of Myrtle which has grown from a sprig which the Queen took from the bridal bouquet of her eldest daughter, the Empress Frederick. Myrtle is always used at bridal ceremonies in Germany as Orange-flowers are with us, and this bush now contributes to the adornment of all the brides among the Queen's descendants. Her grandchildren are now adding on various occasions to her collection of historical trees at Osborne.

In the last number of *Insect Life* we find a report of a new branch of entomological commerce which has just been started by a French firm—that is, the sale of culture tubes for the destruction of the white grub. The circular which the firm sends out explains that there has been discovered a specific vegetable parasite which destroys this grub. Following the methods of Pasteur, the firm have undertaken the artificial production of this parasite, and they offer to sell tubes containing the spores. They guarantee their cultures to be capable of communicating the disease to several hundred worms. The method of treatment advised is, to put about a hundred grubs in a vessel containing some moist sand. The contents of the tube are then sprinkled over the grubs, the vessel is covered, and at the end of six hours the grubs will have the disease. They are then taken out, one by one, and placed six or eight inches deep in the ground in different parts of the infested field and gently covered with earth. Of course, it would be prudent to place the diseased grubs in the portions of the field that are the most thoroughly infested. These grubs, inoculated with the disease, will communicate it to others, and if it spreads as rapidly and proves as deadly as the malady which has destroyed so many silk-worms, it may prove the most effective means of warfare against the white grub. But, after all, it seems at first like an unfair advantage to take of a worm.

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Yellowstone National Park.

IN the early days of the last session of Congress we invited public attention to the necessity of prompt legislative action in regard to the enlargement and better protection and maintenance of the Yellowstone National Park. We expressed at that time a fear that nothing would be accomplished, owing to a persistent and untiring lobby that would prevent the enactment of any law which did not carry with it an exclusive right or franchise for a railway through the north-east corner of the park. The event proved that this apprehension was well-founded. No action was taken by the House of Representatives on the excellent bill which passed the Senate, and which was practically the same bill which had passed that body on four separate occasions. The House, upon receiving the bill from the Senate, referred it to the Committee on Public Lands, and it was by them, after a long delay, reported back to the House with an amendment granting a right of way to the Montana Mineral Railway Company to enter the park and to lay fifty or sixty miles of track to a mining camp lying in Montana outside of the reservation. This amendment was in no way germane to the bill, but a positive injury to the park and the beginning of special privileges and jobberies which would in the end hand the park over to corporations who had no generous or patriotic interest in it or appreciation of it, and cared only to use it for their own selfish purposes. Those who took the deepest interest in the park preferred the postponement of the passage of such a bill until it could be placed on the statute-books without such an objectionable feature as the Montana Mineral Railway franchise.

In the last days of the last session, Congress passed a law entitled, "An Act to Repeal Timber-culture, and for Other Purposes," and among its provisions was one to which we have often alluded. It reads as follows: "The "President of the United States may, from time to time, set "apart and reserve in any state or territory having public "land bearing forests, in any part of the public lands, or "wholly or in part covered with timber or undergrowth, "whether of commercial value or not, as public reserva- "tions. And the President shall by public proclamation "declare the establishment of such reservation and the "limits thereof." In accordance with this provision the President issued a proclamation setting apart as a public reservation a large tract of country immediately adjoining the Yellowstone Park on the east and south. The boundaries of this forest-reservation are essentially the same as those laid down in Senator Vest's bill providing for the enlargement of the park. As a matter of fact, we believe the boundaries were taken from the bill. This action on the part of the President was most commendable as it prevents the cutting of timber and prohibits settlement within the reservation. But as the President had no power to enlarge the Yellowstone Park it is now all the more important that this reservation should be included in the park by Act of Congress and its care and protection made a part of the duties of the superintendent of the park, with authority to see that the rules and regulations established by the Secretary of the Interior are enforced. At the present time there are no penalties for depredations committed, and no power to enforce them if there were any.

Secretary Noble, in his last annual report recently published, calls attention to the needs of the park and takes strong grounds against the admission of any railway. We can do no better than to copy his words: "The Secretary's "opinion, as hitherto expressed, has been that a railroad "would be detrimental to all the purposes for which the "park was set apart. It is earnestly hoped that Congress "will not give up to a private enterprise any part of what "it has set apart for the education and enjoyment of the "whole people. If once such railroad franchise is granted "it will result in the practical abandonment of that region "as a forest and game-reserve. Each year demonstrates "the wisdom of Congress in setting apart this magnificent "domain and the necessity of keeping it under govern- "ment ownership, free from private or corporate intrusion. "It embraces one of the largest forest-bearing districts in "the Rocky Mountains, and contains the head-waters of "some of our greatest rivers. The importance of preserv- "ing such tracts, as affecting the water-supply of the coun- "try, has already been discussed in this report."

Senator Vest, who takes the deepest interest in all matters pertaining to the Yellowstone Park, has for many years earnestly endeavored to obtain favorable action by Congress, and intends introducing the bill of last year in the early days of this session. The tract of country which it is desired to add to the park on the east embraces all the high portion of the Absaroka Range, and is a belt of country between twenty-four and twenty-five miles in width, including all the sources of the upper Yellowstone River. The region is almost wholly made up of volcanic lavas, barren and rugged, but possessing great natural beauty and grandeur. The country which it is proposed to add to the park on the south measures about eight and one-half miles in length, stretching across the entire width of the park and the additional territory which it is proposed to annex to the eastward. It is a somewhat less rugged country than the Absaroka Range, but is equally grand and far more picturesque. It abounds in springs, brooks and lakes, all of them sending their waters westward to the Pacific. The country is one of the best breeding-grounds for elk and deer to be found anywhere in the Rocky Mountains, a knowledge of which is becoming only too rapidly known by hunters and sportsmen. For agricultural and grazing purposes this elevated region is useless. The forest, both in the park and the country which it is proposed to add to it, is essentially coniferous. More than one-half the trees are what are known as Black Pine (*Pinus Murrayana*), which rarely attains any great size, although for economic purposes, for the storing of water, it is quite as serviceable as the more stately trees. The Balsam (*Abies subalpina*), the Spruce (*Picea Engelmanni*), cover large

tracts of country, while all three of these species occur more or less mingled. That sturdy and stately tree, the Red Fir (*Pseudotsuga taxifolia*), in certain localities, stands out grandly conspicuous for its size and the vigor of its growth. Already fires kindled by accident or malice have swept over large areas of this timber, and the forest has no protection against such vandalism in the future.

Secretary Noble, in his recommendation quoted above, only repeats what has been urged before by Secretaries Vilas and Lamar. The need of extending the park and protecting it from invasion is universally recognized. The Senate Bill interferes with no one's rights, and the new boundaries leave an open highway for all needed traffic to the mines. How long shall we be compelled to admit, in the face of all this, that a little knot of speculators, in the hope of securing special privileges, are strong enough to defeat a measure which is to the evident advantage of the whole country?

The appearance of the little book entitled "The Land of the Lingering Snow," which we reviewed last week, suggests anew a reflection which has, no doubt, occurred to many of our readers, and that is one of surprise at the number of books about Nature which are annually published in America, many of them, too, characterized by delicate feeling and pleasing style. More books of this type are published here than in England, where sentiment and the love of natural objects are believed to flourish much more luxuriantly than in our hurrying, supposedly prosaic and distinctly urban communities. Most of these books, too, are written in New England and about New England scenes and plants and birds; and this fact has a curious interest. At first sight we may think that it simply means that only in comparatively old communities do men find leisure enough to devote themselves to the harvest of the quiet eye, or are they apt to inherit a culture broad and deep enough to endow them with that literary sense which must go hand-in-hand with a sensitive mind and keen vision if nature is to be worthily interpreted on the printed page. But a little reflection shows that New England is no older than the other communities along our eastern coasts, and also that the sons and daughters of the east have spread themselves abroad to west and south, where, one might fancy, their natural instincts would be more strongly stimulated by the scenes about them than they could be by a climate and a soil like those of New England. Nevertheless, it is New Englanders living at home who give us most of those books about nature which are not strictly scientific accounts of dry facts and recondite phenomena. Here are born and here write our prose poets of nature. Is this so because Thoreau chanced by an accident to be born here, and set a local fashion? Or was Thoreau a natural, typical product, and are his successors likewise natural, typical products of the same conditions—men and women who would have felt and written just as they do if Thoreau had never lived?

The latter view is, we think, the true one. And, perhaps, it can be interpreted to mean that men always value most highly the gifts which are not too lavishly bestowed, delights which are not too constant and monotonous, pleasures for which they have to work a little and of which they are sometimes unexpectedly deprived. It is the strong contrasts of the New England climate which have filled the souls of her sons with so keen a sense of the beauty of her bright winter days and the loveliness of her sunny summer hours. It is the contrasts which her soil affords—from rocky to verdurous sea-coasts, from high mountains and forest-clad valleys to fertile plains and Elm-bordered rivers—which make their eyes sensitive to each of her changing pictures. It is the length and vigor of her winters that have forced them to study what charms winter as well as summer may present. It is the late shyness of her springs that thrills them with a sense of spring's enchantment. It is the burning heat of her hottest summertime which puts a touch of enthusiasm into blood that would be chilly but for such a potent quickening. It is the royal splendor of her long-drawn autumn, with its soft Indian summer following almost wintry weeks, that gives them that love for color which we miss by contrast when we turn to books that Englishmen have written.

An inhospitable land New England may be called by the agriculturist or the man who likes simply to draw his breath without care or trouble or any noting of outward phenomena. But to the true lover of nature there is, perhaps, no other which offers a more generous hospitality and has its hands more profusely laden with rapidly changing, beautifully contrasting gifts.

Notes of a Summer Journey in Europe.—I.

The following notes of observations, made during a few weeks of the past summer spent mainly in seeing something of collections and botanical establishments in Europe, are not intended as studies, but chiefly as a record of impressions with the natural comparisons one is apt to draw among new scenes and on coming in contact with examples and practices not commonly met with at home. Very often, too, the meeting of familiar objects proves almost as interesting as the novelties. The short time at command necessitated leaving out many interesting places and specimens even on the line of the journey, and, for the same reason, it was not found possible or advisable to fully write out the notes at the moment.

Perhaps one of the first things which attract the attention of an American, if he is interested in the botanical side of Nature, on landing on the Continent and traveling through the country is, that vegetation, as shown in harvesting, etc., is generally not so advanced or hurried as it is at the same date in that portion of New England which nearly corresponds to the same latitude. The cooler summers and the generally greater humidity of the air, of course, account for this, besides giving those regions nearest the sea the perpetually green appearance for which they are noted. It may be for this reason that hybrid Perpetual Roses appear to be much more truly and satisfactorily perpetual bloomers than they often prove in our gardens, where the heat is much drier and more intense.

On arrival at Boulogne, the first landing-place, on July 15th, the Hybrid Perpetual Roses were found bearing an abundance of bloom, and the same was true at Paris. The blossoms of these Roses, however, were no better than we commonly grow at home, and, as is too often the case with us, the plants were badly attacked by mildew and infested by aphides. The latter were evidently greatly checked by lady-bird beetles and their larvæ, and by small parasites similar to those which we find in America assisting to keep the pests in check.

One of the most peculiar features in the landscape in crossing certain parts of France, noticeably in the lowlands and as we approach the Swiss frontiers, is the Lombardy Poplars, which loom up everywhere, like decorated telegraph-poles. Very frequently the greater portions of the trunks have been stripped of their branches, which gives them an even more singular appearance than they naturally possess. It may not be generally known that it is the staminate, or male form, of this tree which we commonly find in cultivation both in this country and in Europe. The female, or pistillate form, is very rarely seen. It is said to chiefly differ from the male in being much less pyramidal in its habit of growth and general outline.

As we approach Switzerland and get among the hills, the Walnut becomes abundant, and it may be seen planted singly, in groves or in orchards, alternately with Apple, Pear or Plum-trees. The size and shape of these Walnut-trees vary greatly according to the quality of the ground and the exposures to which they are subjected; but in the good rich soil of the sheltered valleys they assume a handsome rounded or globular form. They do not usually attain a great height, and, except for the color of the foliage, which is also less dense, they might at some distance be mistaken for very large Apple-trees. Wherever grown throughout Switzerland, the nuts are largely used for the oil which is extracted from them; but they are not generally grown in such abundance as they are south of the Alps.

Although Geneva gets none of the direct modifying influence of the Gulf Stream, is over 1,200 feet above sea-level, and is situated in a latitude somewhat further north than that of Montreal, in Canada, its vegetation shows that it enjoys a winter climate generally quite as mild, if not milder, than that of Washington. The last winter was considered an unusually severe one, the Lake of Geneva being completely frozen over,

an event of extremely rare occurrence. Our great southern evergreen Magnolia is frequently planted in gardens here, and a large number of them were noticed as either dead or very much injured. In fact, the straggling appearance of the best of the survivors showed that the trees are here liable to more or less injury every winter. Some were bearing a good number of their beautiful blossoms, for the sake of which no lover of flowers could resist having these trees in his garden so long as there was a chance of their living at all. The trees do not attain large size here, but grafted plants may be expected to bloom when only a few feet high.

At this time (July 17th to 20th) some large trees of *Catalpa bignonioides* were in full flower, or nearly so, and were apparently quite as much at home and as vigorous as in our own gardens. Specimens of a fastigiate form of our common Locust were noted here and there, the shape being so much like that of the Lombardy Poplar that unless closely observed this form of the Locust might be mistaken for it. The variation of the Locust known as *Robinia Pseudacacia, monophylla*, is occasionally seen in the streets and yards here, presenting such a distinct aspect that many people, not familiar with the numerous forms which the species has developed under cultivation, might readily mistake it for something new. This form often has only one, and usually not more than three large leaflets to each leaf. It must be propagated by grafting, layering, from pieces of roots, or other modes of division, in order to be true, as seeds would probably simply produce the common type, except in a very few cases. Although it is one of our own native trees, the Locust in Europe has a much better chance to develop into good specimen trees when planted singly, because it is, apparently, not liable to injury from such destructive borers as we have to guard against.

Some fine specimens of our Black Walnut (*Juglans nigra*) are to be seen in Geneva, and a tree of the Striped Maple (*Acer Pennsylvanicum*) was noted as having a spread of branches of about thirty feet, and with an equal height. It was grafted on the Sycamore Maple (*A. Pseudoplatanus*), and the stem was ten inches in diameter, being smaller than its dark shaggy-barked stock.

A peculiar feature of some of the streets and quays where shade and, at the same time, an unobstructed view of mountains or lake from houses or hotels is desired, is the rows of trees cut back so that they have a low, flat, or umbrella-shaped top, while the lower branches are trimmed high enough to allow of all ordinary passing beneath. The species most subjected to this treatment, and one which apparently bears it very well, is the variety of the Oriental Plane-tree known in nurseries as *Platanus acerifolia*. This form is very much planted in many Continental cities, and, altogether, as a street tree it compared very favorably with any other kind which came under my notice. The trees rarely showed any evidence of disease. Such a serious blight as the fungus (*Gliosporium nervisequum*), which destroys the growing tips of, and is so injurious to, the Planes in many parts of America, is, seemingly, unknown among the allied trees in Europe; or, at least, it does not appear to a noticeable extent. The foliage, too, is usually remarkably exempt from depredations by insects. The trunk is not liable to attack by borers, and although the peculiar blotched appearance of the trunk is objected to by some people, it has the merit of being smooth and looking as if scraped —facts which are greatly to its advantage in localities where a mania prevails for having the trunks of rough-barked trees smoothly planed or shaved.

The trunks of the trees in the streets of Geneva rarely show any evidence of mechanical injury. Stems of the smaller trees are very simply and effectively protected by having shoots or branches of Locust or Buckthorn placed around them and held in position by two or three bands of light iron wire.

Three species of European Lindens, or Lime-trees, were particularly noticed in the streets and squares. One of these, known as *Tilia platyphylla*, had been out of blossom for some time and the fruit had already attained almost full size. The second species, perhaps, should be known as *T. ulmifolia*, although it is most commonly called *T. parvifolia*, and, among other synonyms, frequently passes as *T. Europæa*. This was in full bloom and attracted many insects. The apparent reason of the name *ulmifolia*, or "Elm-leaved," was quite noticeable in some very large trees here, because the foliage and even the outline of the tree gave much the same effect as that of the common European Elm (*Ulmus campestris*), the leaves of the Linden not being much larger. The foliage of this and the preceding species was sometimes greatly injured by the attacks of aphides and red mites. The third Linden noticed was *T. petiolaris*, a species differing from the others in its distinct habit, its long, petioled leaves with white under-surfaces, and especially in the fact that it had not yet opened any of its flower-buds.

Other Lindens may be referred to later, but attention is called to those mentioned because here were three species flowering in such succession as to furnish a rich and continuous harvest of nectar for bees during a period of six weeks or more—a fact, perhaps, well worth considering when planting trees in a country where apiculture is much followed and where the honey made from the flowers of the Linden is especially prized.

Arnold Arboretum. *J. G. Jack.*

The Colors of Leaves.

IN my article on the colors of flowers the conclusion arrived at is that, next to green, white is the primary color, and the color from which all other colors are derived.

Another question has suggested itself to my mind since writing the former paper—a question entirely germane to the subject—namely, Is the green color of leaves and vegetation generally the original, primordial color, or is it secondary?

The method to be employed in answering this is somewhat different from that used in regard to flowers. We do not find any leaves with a different color at the base, as is common in the case of flowers as, for instance, white; indeed, rarely is a leaf any other color than green when it is found on a stem growing spontaneously in its native habitat, except in the case of vigorous saplings, where the old trees have been felled. On these not uncommonly the leaves are reddish or purple. In cultivated plants, also, we have copper-leaved Beeches, Maples, etc., and some herbaceous plants with reddish foliage. The colors of autumn leaves are not referred to for the reason that they are clearly secondary. One other color occurs more rarely still, and that is white. Dr. E. Lewis Sturtevant pointed out to me at Nonquitt, Massachusetts, growing spontaneously on a border of a marsh, a grass called *Phalaris arundinacea*, var. *picta*, which had longitudinal stripes of white running parallel with the green, and similar in appearance to the garden Striped Grass. In my former article I referred to the fact that sepals and involucres sometimes become white, as, also, some of the smaller upper leaves and upper portion of the stem in *Daucus Carota*; but while native plants with white leaves are rare, there are frequent examples of white in cultivated foliage plants, so called. Among the latter is a variety of the Ash-leaved Maple, which has every leaf bordered with white, presenting to the beholder an odd and fantastic appearance, also a shrubby Althea, similarly marked; also Euphorbia, Ivy Geranium, Coleus, Funkia, Century-plant, etc., are bordered, striped, or splashed with white. The inner leaves of Cabbage are white, and Celery blanches white. This etiolated condition of the foliage is regarded by gardeners to be the result of disease or unhealthiness, and, therefore, not desirable, but yet is tolerated on account of the striking, if not wholly pleasing, effect produced by the unusual contrast of colors. From the foregoing we get pretty strong hints that green is derived from white. There remains one more clue. Every botanist knows that the seed contains a miniature and rudimentary plant; that generally the most prominent parts of this seed are the cotyledons, or seed-leaves, and these are, of course, the first leaves of every species of plants. Now, if we ascertain the color of these seed-leaves we find the original color of all leaves. This color is uniformly white.

Take, as a few familiar illustrations, the seeds of apple, pear, peach, grape, tomato, cranberry, bean, corn, hickory, chestnut, oak, filbert or almond. Of course we do not refer to the colored integuments of the seed, which, as in the case of garden beans, may be white, red, yellow, blue, black, or mixed colors, but to the kernel, or meat. There are a very few instances only where the green color of the plant has impressed, somewhat, that characteristic upon the seed, as in peas, nasturtiums and maples, which present a pale green color in the pod, or shell. In some instances, these cotyledons appear above the surface of the ground changing from white to green; while in others they remain below, where planted, only to nourish the growing stem and succeeding leaves.

Nature, which has all colors at her disposal, has selected green as being the best adapted for the vegetal function; that is, green is "the survival of the fittest" for that purpose. For the promotion of the fructifying function insect agency is important, both in fertilization and cross-fertilization. Insects are guided, doubtless, by bright colors, as well as by scent, and that the colors may be attractive they must be different in hue from the general foliage and in strong contrast thereto;

hence green barely "survives" in flowers, being more rare than any other color.

We learn from this study of color, therefore, that white is the primary color of root, stem, leaf and flower, and the foundation of all color. This assertion, as regards the flower, may demand a word of explanation, for the reason that in my article above referred to there was an apparent exception in favor of green; but there is really no necessity for any exception or qualification whatever, as white is not primarily derived from green, but, on the contrary, green is derived from white in precisely the same manner as any other color is so derived; but as the floral organs in the great majority of cases are formed after the development of chlorophyl in the plant, they naturally, at first, partake of that color; then the green color is completely eliminated and obliterated, the flower resuming the original color of the rudimentary plant.

It follows, therefore, that green is a secondary color in flowers of that color, of which there are a considerable number still to be met with; but in *Monotropa uniflora*, and doubtless others of like character, we have an illustration of flowers of the original white color which never have been preceded by green.

I may be permitted to add in this connection, as confirmatory of my opinion, that all colors appeared in primeval times, that in Lichens, plants which rank low in the vegetable kingdom, colors are found in as great a range, and possibly greater, than is found in Phænogamous plants, as will be seen from the following partial list of the colors mentioned by Tuckerman in his description of North American Lichens, namely:

White, ashy white, grayish white, dirty white, greenish white, glaucous white, brownish white, ochroleucous, whitish, palescent, decolorate.

Cream, straw, sulphur, lemon, orange, old gold, ochre, gamboge, greenish yellow, orange-saffron, waxy yellowish, tawny yellow, whitish buff.

Sage-green, apple-green, leek-green, brown-green, dark green, black-green, olivaceous, brown-olivaceous, glaucous, glaucescent.

Orange-red, scarlet, vermilion-red, brick color, reddish flesh-colored, blood-red, vinous red, rosy, rose-red, rusty red, rufous, cinereous-rufescent.

Cœrulescent, steel-blue, purple, bluish, pale bluish; sky-blue in *Leptogium cæsiellum*.

Olive, cinnamon, greenish, yellowish, chestnut, russet, tawny, purplish, reddish, smoky, livid, lurid, leaden, liver and blackish brown, tawny.

Black, blackish and olive, greenish, blue and violaceous black, fuscous, fuscescent, brownish and pitch-black.

Lead, greenish lead, smoke-colored.

Whitish, livid, lurid, leaden, greenish and brownish ash, cinerascent, glaucous-cinerascent, cinereus-glaucescent.

Leaden, bluish, yellowish, glaucous and greenish gray, grayish.

The variety of tints, shades and hues of these colors is something remarkable.

In the foliage of Musci we meet the following colors and hues: Hoary white, silvery white, yellowish and greenish white; golden-yellow, greenish yellow, fulvous; reddish, dark vinous red; bright olive, yellowish, lurid, dull and blackish green; green with a bluish or indigo tinge; pale brown, dark brown, purplish brown, brownish, blackish; drab-colored.

In the capsule we find whitish, yellow, orange, orange-red, dark red, deep purple, dark brown and chestnut.

At times the foliage and the fruiting parts are differently colored, as in *Barbula cæspitosa*, which has pale green foliage, yellow capsule with a red operculum.

The sporules are also of different colors; so in Lichens the apothecia or Lichen-fruit, namely, in the part called the disk, differ more or less in color from the thallus. In these respects both classes of plants resemble the frequently different colors of pollen, anthers, petals and leaves in the same plant, so that it may be questioned if the bright colors of ordinary flowers were created primarily to attract insects, unless the apothecium of the Lichen and the capsule of the moss subserve the same purpose, which question should be investigated.

In *Hepaticæ* the colors are similar to the Musci, with the addition of pink, rose-purple and violet.

The *Algæ*, or sea-weeds, lower forms of vegetable life, rival the Lichens in their great variety of color; and the Fungi, plants next higher than the Lichens, display many tints and shades of white, yellow, red, blue and green.

The lowest and the most minute of all known organized structures are *Bacteria*. "These are usually white in color, although some species possess beautiful tints of red, of blue, of yellow, or even green."

New Bedford, Mass. *E. Williams Hervey.*

Cacti in Landscape-gardening.

CACTUS-GARDENS and Water-lily ponds are the most notable additions to the practice of ornamental planting in America during recent years. The Water-lilies have many advocates, but Cactus management does not seem as well understood. In our immense country there is a width of variation in soil and conditions which we hardly realize. Industrial conditions compel many of our people to live in barren or arid regions, and in these Cactaceous plants are of the greatest value. In some of the dry parts of the far west plant-loving people have formed Cactus-gardens of the greatest interest, and of a beauty that vies with the herbaceous gardens of the east. Some of them are stocked with the Cactaceous riches of the earth, and are world-wide in their fame. Even in the showery east there are situations where some varieties of Cactus can be employed. They should not be permitted to occupy positions which can be more acceptably filled by other plants which are by nature more thoroughly adapted to such surroundings, but in a few situations where they are perfectly in keeping, and other things will not thrive, they are most useful. They will flourish in a stone-paved court with only soil enough to root in, and where one day's roasting in summer sunshine would dry other plants to death. They will take their chances on a roof with perfect success, while their owners can spend the summer away from home. For those who still incline to carpet-bedding, the employment of large Cactus-plants, with numerous small ones in geometrical patterns, will afford great pleasure. They do not soon outgrow their space, and they give a most interesting variety of color. The delicate and complicated designs produced with them associate harmoniously with the cut stone and terra cotta of modern buildings.

Their proper arrangement in beds by no means confines us to regular forms, however. The picturesque growth of many sorts especially fits them for irregular arrangement. This can be made with rocks and stones common to the soil in any particular region. The plants need thorough drainage and full exposure to bright sunshine, if they are to bloom the following season. Enough of one variety, especially of the low-growing kinds, should be grouped together, to show their true character and expression. The ground can be as irregular as fancy dictates or chance ordains, for this displays their distinctive qualities to best advantage. Rock-work is a combination that suits them admirably, but it requires great skill in management to insure artistic success. Peculiar and striking stones should, as a rule, be avoided. Those with weather-worn and lichen-covered surfaces are desirable. An exception to this I have noted in a bed where the surface of the ground not occupied by Cacti was entirely covered with pieces of white marble, which brought the plants out in strong contrast. In this case there was so much marble and many white objects in the vicinity that the color was not obtrusive as it otherwise must have been.

When tender kinds are used for planting out in summer, the plants are better kept in their pots, which, however, should be entirely covered by earth or low-growing plants and stones. Sods can be used to advantage when there is grass in the surroundings, but it should be kept shorn short among the plants. Houseleeks, Sedums, Mesembryanthemums, Stapelias, or any low-growing succulent plants that do not need a moist soil are useful for covering the ground and pots. In the warmer parts of the United States permanent Cactus gardens of great beauty can be constructed of many varieties, but the number of these that will endure a temperature of ten degrees below zero is so limited that our efforts north must be less ambitious.

The common Prickly Pear (*Opuntia vulgaris*) and the nearly allied *O. Rafinesquei* and *O. Missouriensis* are the most useful. Some of the little Mamillarias are hardy, but so small and delicately beautiful that a quantity must be employed to be effective. The hardy Opuntias can be grown in flower-beds, if dry enough, with the same cultivation given other flowers, but are more satisfactory if employed where other things will not flourish. As a successful example of their use I recall a spot on one side of a lawn where a rocky ledge came close to the surface. The ledge was once visible but the top had been blasted away and covered with soil. Every summer, however, the grass here dried up and disfigured the lawn. Soaking the place with water twice a day finally kept it green; but this was expensive, and, after all, the turf differed in color and texture from the rest. Some good-sized stones, brought from a neighboring pasture and relaid in the ground on the troublesome spot, following somewhat the irregular outline of the brown grass, and some suitable soil filled in between them, and then more weather-worn rocks

partly embedded in it, gave the whole once more the appearance of a natural ledge. The spaces between the stones were thickly planted with hardy Cacti, that have flourished for four years with no care, and have annually shown a crop of blossoms that vie in beauty with any on the grounds. The place is always interesting and never looks bare.

Again, at one of the finest country places on the north shore of Long Island Sound there is a most attractive summer-house built on a rocky bluff overlooking the water. Before it became part of the pleasure-grounds the top of the bluff had been blown off with dynamite, leaving the surface in a raw and shivered condition, which was depressing to the artistic sense. Covered with soil it yielded a little grass in spring, but this soon died, as did every plant and shrub set there. Vines could not reach it, and contrasted with surrounding beauty it seemed more mournful than ever. This almost hopeless spot was at last planted with native Opuntia, which found the situation congenial, and they now cover the entire surface, hanging over the edge of the bluff in the most effective manner. Starred with brilliant yellow and orange flowers, the effect is particularly fine when seen against the blue water. A hard gravel path leads to the summer-house, and the whole is so uncommonly attractive that visitors always admire it.

At another place hardy Cacti and Stone-crop in variety are used to fill some vases of stone and terra cotta on a terrace overlooking an extensive prospect. The situation is such that other plants could not receive proper attention, but these enduring things hold their own, summer and winter, and the weather-beaten old plants have an attraction all their own.

Cacti are not good playthings for small children, but plants that are often left lying about a greenhouse or garden in summer, objects of no beauty in themselves and a nuisance to everybody who comes in contact with them, could often be grouped about a rock or some barren spot, and thus be made one of the admired features of a place. Like Orchids, Cacti must be studied to be appreciated. If we attempt to grow and arrange them like Roses we shall fail. They are not strictly greenhouse-plants, and forcing often fails. They are the delight of people with moderate appliances and little time to spare for the garden. A light, warm, dry cellar or room, where an even temperature can be maintained through the winter, and all the exposure we can give them in summer, will enable us to keep almost all tropical kinds, while those native to the northern states want but one planting and a chance to grow. They can be moved at any season when the ground can be broken. The monstrosities produced by grafting and mutilation are fit only for people fond of freaks, and not to be considered in serious landscape-work.

New York. *John De Wolf.*

New or Little-known Plants.

Viburnum tomentosum.

THE Japanese Snow Ball, *Viburnum plicatum*, as it is called in gardens, is now one of the best known and most highly prized of the Japanese shrubs commonly cultivated in this country. It is one of the garden forms of *Viburnum tomentosum*, a species widely distributed through China and Japan, whose portrait is published on page 594 of this issue. *Viburnum tomentosum* is a handsome plant, with foliage very similar to that of *Viburnum plicatum*, but the flowers, instead of being all sterile, are mostly perfect, with a few large pure white sterile flowers on the margin of the broad flat cymes which resemble in general appearance those of the familiar *Viburnum Opulus*.

Viburnum tomentosum, although botanists have known it for more than a century, appears not to have been much cultivated outside of its native country, and I do not remember to have seen it in any European collection, although the name appears in the catalogue of the plants in the Arboretum Segrezianum. It seems, however, that it has been in this country for a number of years, and I received last spring specimens from Mr. E. Williams Hervey, of New Bedford, Massachusetts, from a plant which had been growing for many years in Mrs. Edward Haskell's garden in that city, and also from Mr. John Robinson, of Salem, whose plant, originally purchased from Ellwanger & Barry, the Rochester nurserymen, is now twelve feet high and eight feet through the branches. An illustration of this plant in bloom appears on page 595, and shows how completely the flower-clusters cover the branches and render it an object of singular beauty. *Viburnum tomentosum* may be seen, too, in at least two other Salem gardens, and, no doubt, now that attention has been called to it, it will be found to be not uncommon. It is probable that the Japanese use the single form as a stock on which to graft the sterile *Viburnum plicatum*, and that the plants in this country are stocks which have grown at the expense of imported plants of *Viburnum plicatum*. But in whatever manner it may have first reached the United States the normal form of *Viburnum tomentosum* is a handsomer plant in every way than its garden variety, just as *Viburnum Opulus* is a more beautiful and desirable plant than the Snow Ball, a variety derived from it.

Our figure is from a drawing made by Mr. Faxon of a specimen for which we are indebted to Mr. Hervey.

C. S. S.

Cultural Department.

Deterioration of Varieties.

IS there any such thing as a real deterioration of the varieties of our cultivated fruits? By this I mean to ask whether, when a new and valuable seedling of any of our cultivated fruits (or even of our wild ones) is produced, we must expect to see it, with the passage of time, lose its desirable qualities, and fall out of cultivation, necessarily, for that reason? I know that with many growers this view of the subject finds more or less acceptance, and I have held the matter in mind for a long time, subject to the tests of observation and inquiry.

It is not altogether a bad thing perhaps to live in a hard place to grow something that one ardently desires to grow. On this one point I was rather trapped in coming into north-eastern Vermont from eastern Massachusetts. A kind friend cautioned me to look out in regard to schools, and I settled in an academy town; but nobody hinted to me that there were places in New England where the common tree-fruits of the country could not be made to endure the winter's cold. For a while, buying the hardy varieties of the nurserymen's lists, I paid careful heed to the advice of our best books in regard to more or less tender kinds. These were, chiefly, not to grow them on too rapidly, and to cut back severely. Well, I followed the advice, and a few of the many sorts I was trying lived along "at a poor dying rate," bore a little poor fruit, and succumbed to the first test winter. I supposed this to be all in the order of nature and circumstance, until my kind friends, Mr. Goodale, of Maine, and Mr. Manning, of Massachusetts, respectively, sent me trees of Oldenburgh and Tetofsky. When these got fairly under way I found no need whatever to starve or to cut back. They grew according to their own sweet will, barring a little gentle guidance, and soon were loaded with abundant fruitage. Even the extra-hardy Talman Sweet, Fameuse, Yellow Bellflower and Red Astrachan of the catalogues had shown their inability to stand our highland temperatures; and this experience with the last-named had prevented me from having much faith in the alleged superior hardiness of the Russian Apples. But since then I have learned that, though Astrachan is a part of Russia, it is the extreme southern part, with winters little, if any, more cold than those of southern New England. It is only in central Russia, or about the latitude of Voronesh and Riga, that the true iron-clad tree-fruits of Russia are found.

Now, further observation has instructed me that there are other causes, besides extreme cold, which affect some varieties severely and others in the same place not at all. "Yellows" is not known, or is very little known, as a disease of the Peach in our southern states. The blight of the Apple-tree on the black prairie soils of Illinois and Iowa is a most destructive disease—as prohibitory in its effects as the severe cold of our northern mountains in regard to many varieties. Black-spotting of valuable apples, like Fameuse and its seedlings, is not remarked to a great extent in suitable localities. Fameuse Sucrée, for instance, or McIntosh Red, I can get from ninety miles away, near the St. Lawrence River, quite free from spotting, but I cannot grow them so. The weakening of the vitality of these trees by our greater cold, though it does not kill them, so affects them that they do not resist their fungous foe. I hear from many places in middle and southern Maine, where I have distributed cions of these excellent dessert apples, that they grow quite fair, and are likely to prove valuable acquisitions, worthy of extensive planting.

Now, reflecting on all these facts and taking full account of

what they may be made to teach, is it not probable that what we are asked to call the "running out" of varieties is simply a local yielding to unfavorable conditions of soil, temperature, or certain atmospheric conditions? May it not sometimes be justly attributed to erroneous methods of culture, or even to neglect? In the case of the apricot, for instance, is it not now plain that the reason why our eastern markets rarely exhibit them, after a hundred years of effort to grow them, is that we were trying to grow them on the wrong side of the continent? It seems to me that everywhere we must expect that under unnatural conditions no fruit-tree will long be able to maintain itself in perfection of growth and fruitage.

While these thoughts have been the direct result of practical experience as a grower of tree-fruits, in different localities, for many years, I do not want to put myself on record as entirely disbelieving the possibility of the deterioration of varieties under even favorable conditions. Some varieties must be weaker than others in constitution. We know this to be true of animals and may reasonably infer it to be so of fruit-trees. For instance, the Fameuse, though so long successfully grown on the Island of Montreal, is apparently going back on its record within the past ten years. Perhaps this may be owing to the growth of the city and the effect of atmospheric vitiation in consequence. We cannot be certain on any of these points, but I would remind your readers that these "run-out" sorts may often be capable of renovation through a mere change of conditions.

Newport, Vt. *T. H. Hoskins.*

Fig. 93.—Viburnum tomentosum.—See page 593.

Cyclamen Persicum.

TO grow Cyclamens in perfection it is absolutely necessary to avoid all extremes in temperature. An equable moist atmosphere is the only condition under which the best qualities of these plants can be brought out. The Cyclamens being by nature woodland plants—that is, growing in groves, thickets or other moderately shady spots, where changes of temperature are not sudden—it is easy to understand why the plants thrive best in the surroundings above indicated. It is not always easy to guard against excessive heat during the summer months in this country, but by means of shading canvas, open-air cultivation and sprinkling of the ground about the plants, this can be accomplished well enough for ordinary practice.

Another important fact to be remembered is, that old seed is unreliable, and a greater difference in size will be observed in plants obtained from such seed than in a lot from fresh seed. Fresh seed should be sown, and sown as soon as possible after it can be obtained. August is a good time, and the seed should be sown in well-drained shallow pans in a compost of peat, sand and loam, with some finely chopped sphagnum added, and then lightly covered and kept moist by careful sprinkling. The pans should be placed in a frame in a temperature of no less than fifty-five degrees. If the seeds are fresh the young plants will appear in four or five weeks, and should be pricked off in shallow pans, with a somewhat richer mixture of soil, omitting the sphagnum. As soon as the plants have a few leaves, and are deemed sufficiently strong, they should be potted singly in two-inch pots, and all check to their growth should be avoided by keeping them in a temperature of fifty-five or sixty degrees, near the glass, moist and shady. Of course, they must be repotted as the roots fill the pots, every time in a slightly richer soil. Plenty of fresh air is necessary under all conditions. Early in spring the corms of the plants ought to be as large as a walnut and well studded with short robust leaves. Now, as soon as the weather will permit, put them out in the open air, in a shady position, and plunge them in a layer of sawdust or well-decayed horse-manure; if the latter, it must not be allowed to heat. All summer long the young plants must never suffer from want of food, water or air. A light syringing overhead every bright morning is advisable, and on hot days the ground around and the woodwork of the frame should be thoroughly soaked several times a day, to keep the air cool and fresh. A canvas shading stretched high above the plants, so as to prevent direct sun rays, but permit plenty of light and a free circulation of air, should not be omitted.

By autumn the corms should be about two inches in diameter, the sturdy leaves will cover the pots, and signs of flower-buds can be seen. They should now be potted for the last time, in seven or eight inch pots, removed to their winter quarters in a light, airy greenhouse. They will commence flowering in December, and, if kept cool, when in full bloom will, as everybody knows, keep a long time in perfection. Few plants can compare with a well-grown Cyclamen for lasting beauty, and even when most of the flowers are gone the handsome leaves are in themselves an ornament. I have seen Cyclamens kept in living-rooms and parlors a considerable part of the winter without losing their freshness and beauty; but care must be taken not to overwater them when in bloom. This is the time when the greatest caution in watering should be exercised, as Cyclamens, like most similar plants, flower during the drier season. It may be necessary to remind novices that the corm should not be buried, but that its upper half should be left above the soil.

New York. *N. J. Rose.*

Fig. 94.—Viburnum tomentosum in Flower.—See page 593.

Winter Gardening in the South.

THE longer I live in North Carolina the more I become convinced that our people hardly realize the great possibilities of winter gardening here. Of course every one knows that such hardy things as Lettuce, Kale and Spinach will grow thriftily here all winter, and many plants which can only be wintered with fire-heat at the north come through safely in a glass-covered pit. But few realize the amount of enjoyment that can be secured from a cold frame here on a rich bed of soil with no protection but the sashes. It is known that Violets, Roman Hyacinths and plants of equal hardiness can usually be had outside all winter, but now and then a cold snap spoils the blooms, and this danger can be warded off by a simple sash, and the flowers will be produced in great perfection. In a cold frame here, with no protection but the sashes, we bloom not only Violets and Pansies but Mignonette of a size never seen in a heated house, Phlox Drummondii of all colors, Petunias like Countess of Ellsemere; Candytuft, particularly the perennial, which often blooms outside as the Phlox does; and we can have Roman Hyacinths and Daffodils untouched by the frost, which frequently spoils them outside. With a little higher frame, to give head-room, Carnations bloom well, and Tea Roses like Safrano, pegged down, will give an abundance of buds. Even such flowers as can be expected in the open air are of much better quality under the sashes, and this superiority alone would be worth the little trouble and expense, especially as hot-bed sashes three feet by six can be had in Raleigh, glazed and painted, for $1.50 each.

It is not only in the flower-garden that this simple protection gives rich returns. Lettuce will grow outside in winter, but it is often scorched by frost, while a few sashes would give fine crisp heads. I have an experimental frame in which seventeen varieties are now growing. To my surprise, the sort known as All-the-Year-Round headed first, Yellow Seed Butter next and larger, with Prize Head close behind and better. The old Brown Dutch is also remarkably fine, and the Paris Green Cos has made fair heads without tying. Our old favorite, Boston Market, while heading well, does not compare with the others. Of the loose types the Black Seed Simpson is very fine. This Lettuce was sown October 1st and has had the sashes pulled over it only on two cold snaps, November 17th and 29th. As fast as the Lettuce is cut out, its place can be filled with later-sown plants from the open border. The first of January we will sow in frames Early Wakefield Cabbage, with Early Summer and Fottler's Brunswick for a succession. These will alternate in the frame with rows of Radishes. The Cabbage-plants will go into the open ground in February, and Tomato-plants from the greenhouse will take their place, and the Radishes will be used. At the same time the Cabbage-seed and some Onion-seed will be sown also in frames and transplanted outside in February, and then part of the frames will be used for starting the early plants of Sweet Potatoes.

The multitude of uses to which a simple cold frame can be adapted in a mild climate is a constant source of pleasure and surprise even to an old hand at the business. Our truckers do not use one-tenth part of the glass which they might use with profit. Most of them use none. The oiled cotton cloth commonly used for spring protection is a poor substitute for glass, and a gardener accustomed to glass soon votes the plant cloth a nuisance except for greenhouse shading. By the way, for a light greenhouse shading, giving a ground-glass effect, the best I have ever tried is two gallons of boiled linseed-oil, a half gallon of Japan varnish, and a half gallon spirits of turpentine, mixed, and applied with brush. The first rain turns the varnish to a milky color and breaks the glare without shading materially. I use it all winter.

Agricultural College, Raleigh, N. C. *W. F. Massey.*

Cattleya labiata.—This new old Cattleya, the rediscovery of which has caused such a sensation in Orchid circles, is now being distributed by several firms—a decided advantage to the purchaser, and, what is satisfactory to all, the supply does not seem to diminish but to assist also in the introduction of other new and desirable plants from the same district. In future, there is no reason why Cattleya-flowers should not be as plentiful in November as in the flowering seasons of *C. Trianæ*, *C. Mendelli* and *C. Mossiæ*, from early spring onwards. It was my privilege a few days ago to see some ten or twelve varieties in flower in the gardens of H. H. Hunnewell, Esq., at Wellesley. The plants in question were bought a year ago for *C. Warocqueana*, and are obviously the true *C. labiata*, and of the many plants in bloom no two were alike; all are distinct, resembling in this respect the favorite *C. Trianæ*. We are told that this Cattleya is easy to grow, and certain it is that owing either to the inherent vigor of the plants or Mr. Harris' skillful treatment, or perhaps both, all of them were perfectly happy and growing and flowering vigorously in their new home. One could not help wishing a long life to *C. labiata*, for the lives of some of the very best are all too short under cultivation.

Scabiosa Caucasica.—Now that the seed catalogues are in process of construction it may not be out of place to protest against the way that seeds of choice hardy perennials are persistently omitted. True, some of the commoner kinds are sometimes included, but for the really good and choice kinds we must send to the seed-growers in Europe, and these, in their turn, will sometimes refer you to their wholesale buyers here, whose lists, you know, do not contain the desired seeds, even if the dealers are aware of the merits of the plants in question. It is quite time that some firm here took up this branch of the seed business and made the fact known. There is no doubt that they would be supported by the flower-loving public now that perennial border-plants are better known than ever before. It was with considerable difficulty that I obtained seeds of *Scabiosa Caucasica* last spring, and they grew and flowered well. During the last week of November I was much surprised to see some of the bright blue flowers in the open border that had many times been frozen, but which were still unhurt. Many complain of this Scabious as being difficult to cultivate, but it is not so here. In moist heavy soil they thrive and bloom the first year, and are perfectly hardy, though the plant is said to be indigenous to arid places in the Caucasus and Armenia. Hardy, or even annual plants that possess this pleasing shade of lavender-blue are rare, and should be made the most of in gardens, especially where cut flowers are desired in quantity.

South Lancaster, Mass. *E. O. O.*

Rust of Carnations.—This fungus, *Uromyces caryophyllinus*, Schr., was noted in the last issue of the *Botanical Gazette* as having recently been brought to the attention of Dr. Arthur, of the Indiana Experiment Station, who, upon examination, found it already pretty well distributed in his state, "some large greenhouses not having a plant free from it." To-day a package of Carnation-leaves was received from a firm in Philadelphia, with an urgent inquiry as to the nature of the trouble that has come so suddenly upon their plants. That they were badly infested with a genuine rust was determined at a glance, and, upon a microscopic examination, it proves to be the same as reported so recently for Indiana. To florists who are interested in this new pest, that is, new to this country, for, like many other such fungi, it has long been known in Europe, it may be said that the trouble can be distinguished from any of the other fungous diseases of the Carnation by the medium-sized plump gray blisters produced upon the leaves, and the larger because longer ones, here and there upon the stems. Like the various other species of rust upon grains, grasses, etc., the mischief is largely done when these blisters appear. The fine threads have previously ramified throughout the plant and taken from it the nourishment that was afterward used up in producing the large crop of brown spores that are packed away under the skin of the blister. It therefore follows that when once a plant is badly rusted there is little hope of curing it. All diseased parts should be removed and burned, and with the worst cases the whole plant should be destroyed. With perfectly healthy plants it is probably true that the rust might be kept out by spraying frequently with copper salts. However, the disease is new to us, and we therefore cannot speak from experience. The chief point of this note is to call the attention of Carnation-growers to the widespread distribution of the new-comer that they may look for it and report new localities as they are found.

Rutgers College. *Byron D. Halsted.*

Spiræa Filipendula, flore pleno.—The plants of an attractive character which thrive in almost any position are none too numerous, and those we have should be known as widely as possible. The double *Spiræa Filipendula* is one of our most useful, and, at the same time, one of the most beautiful hardy perennials. It is equally at home in the rich soil of a border and the almost barren patches of earth which the crevices of a dry rockery afford, in partial shade and the full blaze of sunshine, in the city lot and the country garden. It is also a cheap plant —a plant that every one may have and grow. The species is a common European plant, with Fern-like foliage, which forms a dense mass of the richest green color. The charming clusters of small creamy white flowers are borne at the top of sparsely leaved, erect stems about two feet high. They ap-

pear early in June, and last nearly a month. The variety differs in having double flowers, and in blooming more freely. The flowers of the double form continue in a perfect state much the longest, and they are excellent for cutting, lasting from two to three weeks in fresh water. The stems should be cut away immediately after the flowers fade, and then the foliage will retain all its luxuriant beauty throughout the summer and autumn. The variety can be propagated only by division in spring and autumn; but seeds of the species are obtainable occasionally, and they should be sown under glass early in spring.

Thermopsis Caroliniana.—As the specific name implies, this excellent plant is a native of Carolina, the northern state of that name, where it is said to occur plentifully in the mountainous regions. The plant ranges in height from four to five feet, the unbranched stems bearing large ternate leaves of bright green color, and a terminal spike of showy yellow pea-shaped flowers closely packed around the stalk in a mass from six to nine inches in length. The flowers are very attractive in the mixed border during the month of June, and the plant blooms quite freely. The best position for it is the back line of a narrow mixed border or the centre of a broad bed or border in which the plants decrease in stature to more sides than one. I have seen a large mass of it planted in an isolated and fully exposed position, but it is more striking than beautiful in this way. It is more effective when planted in strong clumps among other plants of similar size and contrasting colors, and the flowers light up the dark green of dull shrubberies wonderfully while they last. The various stems of each clump should be loosely secured to a stout stake in the centre when they become too long to stand against wind and heavy rain, but established plants may otherwise be safely trusted to care for themselves. It is not exacting in its requirements as to soil, and is often found in luxuriant health where many plants of similarly robust appearance would certainly succumb. The large crop of seeds ripened annually afford a ready means of propagation; but they are, however, slow to germinate, and should be raised in heat during early spring.

Cambridge, Mass. *M. Barker.*

The Forest.

The Subjection of Torrents by Reforestation of Mountains.—II.

CÉVENNES.

THE range of the Cévennes is formed by a series of massive, but less rugged mountains than the Alps or the Pyrenees. These mountains are veritable fountains of water, and the rains there fall in deluging showers, such as are seen nowhere else, and all the waterflow there is eminently torrential. It is usually in September that these terrific water-spouts are formed, when the mountains (relatively slightly elevated) are unable, as in the Alps and Pyrenees, to store a part of the precipitation in the form of snow.

As a consequence of the orographic arrangement of the ground, the valleys are continuous, and do not empty, as in the Alps, directly and abruptly into an alluvial plain. Thus one never finds there, even among the most powerful and erosive streams, the great cones of eroded material so characteristic of the mouth of torrents. The transportation of the materials which they bear, after having torn them from the mountains, continues in the torrential river, whose channel becomes wider and wider as it fills up, more erratic and hence more dangerous for the rich farm-lands or the great industrial centres in the lower valleys.

The absolute denudation of the summits and of the higher basins is characteristic of this region. Forests there are still more rare than in the Alps; the slopes are there furrowed by a series of torrents side by side, and by myriads of deep and yawning ravines, even on the most gentle inclinations.

THE PYRENEES.

The chain of the Pyrenees is a geographic unit clearly defined. It includes a variety of climates less complete than the Alps, but having this inestimable advantage that limestone is replaced in great part by igneous rocks, which are more solid and less easily eroded. The general exposure is toward the north, and rains are copious and frequent. The forests, as well as the pastures, reach over vast areas, and are in a comparatively good state of preservation.

The torrent is only found here as an exception, but an exception that will become general if no restraint is placed upon it, and the Pyrenees would suffer what the Alps have undergone, notably in the upper basins of Gave de Paul, the Garonne and the Ariège. The remembrance of the inundation of 1875 is still thrilling, and the activity of certain torrents shows a disquieting tendency to increase. It is characteristic of this region that the active torrents are all of recent formation, most of them having arisen within our own memory.

A comparison of the three regions leads to these conclusions: (1) That restorative work in the Alps will demand far more energy and expense than in the two other regions combined; (2) That in the Pyrenees the important work of correction could be carried through in a relatively short time, and that reforestation there would not be necessary over any great areas; (3) That in the Cévennes a long series of small corrective operations should be carried on in connection with the creation of great masses of forest at the sources of the innumerable streams which descend both toward the ocean and the Mediterranean; (4) Finally, the Alps require the greatest as well as the most numerous corrective operations; and in most of the higher basins a reforestation so complete as to hold in constant subjection the formidable torrents which threaten to make a very desert of the frontier so important to south-eastern France.

SUMMARY.

These works for the public safety are needed in seventeen departments where torrents develop full activity, but adjoining districts also need the benefit of the law, and it would be well if at least one-third of the entire area of France should be made the theatre of "permissible treatment" by the government.

From the beginning of this century means of defense against torrents have been studied.

In articles on this subject engineers have usually confined themselves to the question of the regulation of the deposit of material loosened by the streams, and its retention within the gorges or at the point where they empty into the valleys. But these studies and plans aimed solely to diminish the ravages of the torrents; no one even dreamed of suppressing them entirely. Surrell first introduced the idea of fighting torrents to their utter extinction.

After having discovered by a series of precise observations the causes of the formation and the action of torrents, as well as the causes of the quieting or the extinction of certain ones among them, he set forth the following propositions:

1. The presence of a forest on a surface prevents the formation of a torrent.

2. The clearing away of a forest renders the soil a prey to torrents.

3. The development of forests leads to the extinction of torrents.

4. The felling of forests increases the violence of torrents, and may even cause them to be renewed.

Experiments were carried on during thirty years by foresters over all the mountainous regions of southern France. Innumerable observations, made in the mean time, on the unexpected appearance of new torrents and the influence of existing forests in the same regions, and the definite extinction of a great number of torrents, even in this short period, have fully demonstrated the immovable solidity of these fundamental principles in the great enterprise of the restoration of mountain lands.

As Surrell has said, "Nature, in clothing the mountains with forests, placed the remedy by the side of the danger; she opposes the active forces of the waters with other active forces from the kingdom of life. Ineffectual, indeed, are all our efforts beside these great remedies which Nature dispenses and patiently uses through the centuries! Our paltry works are only defenses, as their name indicates; they are passive masses opposed to active forces, inert obstacles in opposition to eager forces which are always aggressive. Why, then, does not man utilize these living forces to suppress torrents at his will? The fundamental problem is simply to find the best means of covering with a mantle of vegetation the lands ravaged by torrents now or threatened by them in the future. The defense must not begin in the lower reaches of the streams; these will defend themselves as the conditions above are corrected. The real warfare must be carried into the higher regions of the mountains. Every system of defense which does not first check the erosions in the mountain will always remain incomplete."

These ideas were not shared by all. Eminent engineers divided torrents into two classes: the curable ones, which they thought might be subdued by reforestation; and the incurable, whose basins did not seem susceptible of being covered with trees. The first class they would commit to the foresters, the second to engineers. The Legislature did not

admit this classification, but entrusted to the foresters the bold mission of reclothing the mountains, under the inspiration of Surrell, the apostle and master of this wise and beneficent policy.

THE EXECUTION OF THE WORK.

In an enterprise without precedents the best guide was indisputably the "Study of Torrents," by Surrell; but, notwithstanding the correctness of its principles, the task was, at the outset, beset with difficulties, and at times, it seemed, with impossibilities. It is small wonder that the engineers considered many of these torrents invincible. The impression produced by the sight of these devastated regions is a sort of stupor, or, at least, of discouragement, which makes one doubt the power of man in the face of such disasters. But if we analyze the conditions with care—if we compare the land in question with other regions less devastated or still wooded—if, finally, we study precedents which exist, although on a very much reduced scale, we shall feel confidence in the means of regenerating the mountains, which man alone has brought to a state of apparent ruin. This re-assuring faith which inspired the foresters was well expressed in the beautiful aphorism of Viollet-le-Duc, in his work upon the grandeur of Mount Blanc: "In Nature there are no little forces, or, rather, the work of Nature results only from the accumulation of little forces. Man is, therefore, able to act his part, since these little forces are under his dominion, and his intelligence enables him to appreciate their effects."

It was indispensable for the foresters to begin cautiously, and to try first a series of experiments of a duration and of a magnitude sufficient to enable them afterward to adjust the remedies to the extent of the evils to be corrected. Their first efforts were to create forest-masses on the denuded slopes, and it is only casually, and on certain small typical torrents, that cautious corrective trials were made, from the results of which a series of well co-ordinated observations was to be built up as a basis for the treatment of greater torrents. Having become familiar with the kind of dangers to be met, and once armed by long study and observations, they dared to assault resolutely the most formidable torrents. It is thus that in the lower Alps the correction of the torrent of Labouret, subdued after eighteen years, furnished a complete series of most valuable observations. It only remained to use the principles thus established in treating the great torrents of the valley of the Ubaye, the extinction of which, begun in 1872, is to-day accomplished.

The experimental methods in the Alps of upper Provence were ultimately applied in Savoy, Dauphiny and the Pyrenees. Everywhere they have given the quickest, the most economical and the most conclusive results. We possess at present, therefore, all the most desirable and most varied experiences in all the kinds of work that may be necessary for the extinction of the greatest torrents.

I will not detain you to describe the divers operations executed throughout our field of action, but I desire to deduce from these experiences of more than a quarter of a century the principles which have been justified by facts.

The method of treatment is based ultimately upon the entire reforestation of all the tributaries of each basin susceptible of being eroded. The forest, thus re-established in its natural place in the upper basins, is alone capable of insuring the ultimate extinction of the torrent by maintaining forever the beneficent effect of corrective works which are temporary and precarious at best. These works, in fact, have usually proved ephemeral, except certain great works of unusual importance, which, kept up by proper repairs, will be found in the future the only witnesses of the first temporary construction by which the forest will have profited to establish itself firmly and develop vigorously, until its perpetual vitality is finally substituted for inanimate works. The regular course pursued is as follows: (1) A survey and map of the boundaries of the lands to be reforested or to be kept wooded in the basin of the torrent; (2) Reforestation, as prompt as possible, of all the stable lands within the boundaries; (3) The fixing of the unstable lands by corrective works; (4) Reforestation of unstable lands as soon as they become fixed; (5) Finally, the selection of the engineering works which it will be necessary to preserve in the future.

On the side of sylviculture, the first question to consider was to know whether forest-vegetation could be introduced into altitudes much above that of the actual forests. Upon the solution of this primary question depended in most cases the justification of the method, because a great many of the larger torrents have their origin in altitudes of nearly 3,000 meters, while the actual forests hardly reach 2,000 meters.

It has been made a rule to stop only where the snow lies for several consecutive years, and we have sowed or planted, as the case demanded, either Larch or Cembran Pine. Each Pine or Larch becomes the centre of a circle of herbaceous vegetation, increasing spontaneously from year to year, following a law of selective association, which impresses every observer. In a little while the mountain recovers its double helmet of forestal and herbaceous vegetation, and nature regains her rights.

The reforestation of stable lands may be accomplished in a very few years. If care is taken to prepare at the outset the nurseries necessary for the different altitudes it is possible to attack in the same year all the different climatic zones in their most favorable seasons. At great altitudes special nurseries may be dispensed with if some small grassy plats are provided. It will suffice at first to sow appropriate seeds very thickly, which at the end of four or five years furnish myriads of plants that may be taken up and set out with pieces of sod, a course that would hardly succeed with plants from a cultivated nursery. Seedlings thus produced may be kept until seven or eight years old, to use in banks and crevices, where the young plants run great risk from stones brought down by the melting snows and the hail-storms. Years of experience justify the utmost confidence in our ability to reforest stable lands.

The unstable lands usually occupy the steep banks of the torrent or the slopes immediately above them. This instability is nearly always due to erosion by the torrent, sometimes longitudinal, and again lateral, by cutting under the bottom of slopes, which induces destructive landslides.

When the slide is over, the earth is left in the form of a series of shelves or steps, at the bottom of which the soil has a slope opposite to that of the general surface, and the result is a series of depressions, into which the snows are drifted by the winds. In spring the water from the melting sinks into the fissures, saturates the earth, and thus causes the formidable slipping away of entire mountain flanks or enormous washes of mud in certain sections. It is in these sections that corrective operations act the most important part.

Correspondence.

The Great Wurtemberg Linden.

To the Editor of Garden and Forest:

Sir,—In one of the August numbers of Garden and Forest you mentioned the remarkable Linden of Neustadt, in Wurtemberg, and the readers of your journal may take some interest in learning a few more facts concerning this giant, which can rival some of the Big Trees of your Pacific coast, if not in height, at least in the size of its trunk, and in age.

Mr. Falter, a resident of the said town, writes as follows on this subject:

In 1867 the trunk was described as having a diameter of twelve feet and a circumference of thirty-seven feet. The botanists Kemmler and Von Martens, in their flora of Wurtemberg, published in 1882, gave a circumference of forty-two feet. In reality these dimensions are difficult to verify, because the main trunk is surrounded with a solid wall of support two feet in height. One of the principal branches, which threatens to fall off, is likewise protected by a wall, and these make measurement impossible. The height of the trunk to the branching is only six feet. The branches extend horizontally over the ground. Eight young Lindens have been planted at different times to fill the gaps in the dome of verdure of the principal tree. The total height of this is to-day seventy-two feet. On June 17th, 1773, a storm broke off one of the two vertical branches at a height of thirty-two feet from the base. The scar is now well covered with a new bark, but the tree suffered greatly by this amputation. On July 18th, 1847, during a hard tempest, the second vertical branch was broken thirty feet from the trunk, and this grave wound is seen very plainly through the foliage, and will never be cured. The diameter of the whole crown, from one extreme branch to the other, is 114 feet. The original trunk and the principal branches are filled with masonry in order to delay the destruction of the tree, which is visibly approaching, for in many places the sap has ceased to circulate. The tree belongs to the species *Tilia grandiflora*, Ehrhart, while the trees planted around it are *T. parviflora*, Ehrh. The columns intended to support the horizontal branches of the tree still exist to the number of ninety-eight, ninety being of stone and eight of wood. A few are no longer in their places. Kemmler and Von Martens add, that this Linden marks the place of an ancient tribunal which was held in the open air. Indeed, everywhere in Germany during

the Middle Ages it was under the shade of Lindens that the people were accustomed to assemble and discuss matters of public interest.

The age of this tree is believed to be about 700 years.

The fact that a place which is the capital of a district has the name of a tree added to its official designation, "Neustadt-by-the-Linden," speaks sufficiently for the size of the latter.

Of the two species, it is *T. grandiflora*, Ehrh. (syn. *T. platyphyllos*, Scop.), which produces the largest trees, and Wurtemberg can boast of possessing the very largest of all. Another large Linden is standing near Leukirch, while at Isny there is one thirty feet in circumference and ninety-five feet in height. Such trees are supposed to be more than 600 years old.

Basle. *H. Christ.*

Damping Off.

To the Editor of GARDEN AND FOREST:

Sir,—This subject, recently (November 18th) discussed in GARDEN AND FOREST by Professor Halsted, is of such profound interest to propagators and growers that it would have been instructive had he given in his article a synopsis of the methods he employed to determine the existence of the fungi which he discovered in the seeds of Beans that he tested for that purpose the past season. It is clearly of the first importance to know decisively and incontrovertibly if the disease does have its genesis in the seed or in the soil, as the best methods of combating it for one is inapplicable to the other. If in the soil, thorough roasting of the soil of seed-beds, boxes or pans will be all-sufficient. If inherent in the seed, we must have recourse to germicides.

I have subjected various tree-seeds to close microscopic examination, failing even in the dust which lodges upon rough-coated pericarps to find an appearance of micro-organisms. The same lot of seeds germinated in moistened cotton exhibited no fungoid tendency, but, sowed in good loam, damped off at an alarming rate. The recommendation of some works on gardening is to use for seed-starting leaf-molds, peat, rich garden-soils or various composts of the three.

Such soils, rich in nitrogenous compounds, furnish the best possible vehicles for the rapid development of the disease.

Another practice much in vogue and equally pernicious, is the "riddling" or fine pulverization of the soil. The necessary sprinkling tends to further disintegrate the fine particles of the soil and resolve the surface into a nearly air-tight skin, prejudicial to seed-sprouting and favorable to fungoid life.

The so-called mineral soils, such as limestone, decomposed granite, and even clays, reduced to a proper mechanical condition by admixture with sand, I have found excellent media for this purpose. With these, when thoroughly roasted, I have so nearly attained immunity from damping off, that I have small faith in the notion that the disease originates or exists within the seed, except in isolated cases.

The stress with which Mr. Halsted urges the necessity of having "a healthy soil" for such operations, exactly falls in line with my own observations, and, I think, covers the whole field.

If his postulate of the inherency of disease in the seed holds good, no amount of health in the soil will help us, not even purification by fire, and we must have recourse to antiseptics.

California Experimental Forestry Station. *Wm. S. Lyon.*

Are Large Strawberries a Modern Production?

To the Editor of GARDEN AND FOREST:

Sir,—In the "Quadripartitum Botanicum," by Simon Paullus, a Dane, in 1708, the author says he has seen a variety of Strawberry, of the kind Bauhin calls Prune-sized, which produced a fruit nearly the size of a peach. I give the original Latin, on account of the interest:

"Vidi enim eam Fragariæ speciem, quam Bauhinus: *Fragariam fructu parvi pruni magnitudine* . . . fructum produxisse, ut fere æquaret magnitudinem mali Persici, nondum perfecte maturi, cui tamen similis altero anno."

South Framingham, Mass. *E. Lewis Sturtevant.*

Periodical Literature.

The December number of the *Overland Monthly* contains an interesting illustrated article on Flower and Seed growing in California. The growing of seeds for commercial purposes is quite a recent industry, and even the California Poppies which have been planted in gardens there were often raised from seeds which have been imported from Europe. This plant, both in eastern states and in Europe, is said to be inferior in the size and color of its flowers, and hence the Poppy grown from foreign seed in California is not so beautiful as the wild plants in the fields. The bulbs of the Mariposa Lily, or "Butterfly Tulip," however, have been for some time articles of export, a single collector in Ukiah selling 100,000 every season. These have not yet begun to return to California from the bulb-growers of Europe. However, a glance at the catalogue of European florists shows Scarlet Larkspur and Lobelia, elegant varieties of Dodecatheon, Brodiæa, Mimulus, Ceanothus, Phacelia, Azalea, Rhododendron, Clematis, and a late acquisition—the Scarlet Perennial Pea. Lily-bulbs, too, and many wild plants are collected here for European commercial establishments. Californians have discovered also that they can grow seed and bulbs of many plants which are not native, so that Onion-seed and Tuberose-bulbs are sent to the east in carloads. The trade in cut flowers is much more local, but two carloads of Orange-blossoms and Callas were sent to Chicago last April. The stems of the Orange-flowers were first dipped in wax and afterward placed between layers of moist cotton. Thirty-five thousand Calla-blooms were placed in wet sawdust, with their heads supported by damp moss. This suggests a new way of disposing of the flowers of the Calla, which is most prolific here although it is raised chiefly for local ornamentation and for the shipment of its tubers. The picture of a Calla field in bloom reminds one, by its shining whiteness, of the great fields of Lilies in Bermuda, only the Callas are grown here on a larger scale. Another industry is found in the Pampas plantations of Santa Barbara, where this tall grass is grown in rows from ten to fifteen feet apart. The second year each stool will produce from fifteen to a hundred plumes on stalks twenty feet high, and in 1870 they were in demand at from $50 to $60 a thousand. The average wholesale price, however, is $30 a thousand. An acre has been known to yield 10,000 plumes a year. England and Germany send the largest orders for these plumes. The latest development of floriculture is seen in the Rosalita Farm in Los Gatos, where the manufacture of the essential oils of Rose and Geranium has been put to practical test with gratifying results. Ten thousand Rose-bushes were imported directly from Grasse, and a still was brought over from France. The essential oil, which floats on the surface of the water from the condensed steam, is the attar of Rose, which needs only settling to be ready for market, while the water accumulated in the reservoir is soft and fragrant and sells on the place for $1.75 a gallon. Besides Roses there are acres of Geraniums, Cassia, and a peculiar species of Orange-tree used only for its flowers.

The sale of cut flowers in California is very large. The Violet is the most prolific flower which bridges the gap between the fall Chrysanthemum and the early spring firstlings of the nursery. At Sherwood Hall there are five acres of choice varieties of Violets growing thriftily in the rich leaf-mold in a grove of gigantic Oaks. The rows of plants reached up to the very trunks of the trees. The work of picking these flowers is left to Chinamen, who are kept busy for six months of the year, and every morning the crop is sent to San Francisco. Sweet Peas are another specialty in this nursery, and transportable flowers, like the Violet, the Aster, Chrysanthemum, Tuberose, with thousands of varieties of Maiden-hair Ferns, are sent to Tacoma, Salt Lake, and even to Chicago.

Many women in California gain a livelihood by raising flower-bulbs and seeds for market, and many others send huge hampers to San Francisco every day of wild flowers and ferns which have been picked from the neighboring cañons. Mrs. Theodosia Shepherd, of Ventura, stands foremost among these successful floriculturists, although only eight years have passed since, without means and broken down in health, she grew her first seeds for market in the old mission town of San Buena Ventura. She now fills orders from prominent eastern florists, with occasional calls from Europe, Australia and the Sandwich Islands. Her gardens comprise eight acres of fertile soil, which are under her personal supervision. She grows all the new seedlings among the French Cannas, for example, and one of her own called Ventura, which is said to be as large-flowered as the famous Star of '91. Last year she harvested 160 pounds of Smilax-seed, which were packed and shipped by Mrs. Shepherd and her three daughters.

Notes.

In the address of Mr. James Fletcher, President of the Association of Economic Entomologists, it is stated that insects cause the enormous loss of $380,000,000 annually to the agricultural products of the United States; that is, more than a

million dollars every day. It should be added that investigations in economic entomology, during late years, have given the farmers of the country the means of successfully combating the most destructive of these insect pests.

More than 200,000 sacks of Lima beans are piled up at Ventura, California, waiting for better prices. A year ago these beans brought five and six cents a pound; this year only two or three cents are offered.

To a correspondent who asks if the Jerusalem Cherry is a suitable plant for a window-garden, we would say that this fine old-fashioned plant is really one of the very best of house-plants. It is handsome, and can be grown with very little trouble. Visitors at the late flower-show in New York will remember a row of these plants about the fine mass of Cannas exhibited by Mr. Dean. For a border of this sort, and for many other kinds of decorative work, the Jerusalem Cherry is invaluable.

On the Experiment Grounds of the United States Government at Medicine Lodge, Kansas, forty acres of land were plowed and then subsoiled to a depth of eighteen inches and planted with Sorghum cane, and another piece of ground was plowed to the ordinary depth and planted to cane of the same variety without subsoiling. Both fields received the same cultivation, and the subsoiled land yielded eighteen tons of cane to the acre, while the best yield of the other ground was only ten tons.

When ground is cleared for agricultural purposes in California the standing trees are sometimes removed by the aid of explosives. By removing a little dirt from around the tree the position of the main roots or the tap root can be located, and a hole is driven along the tap root or between the principal roots with a long crow-bar, and this is charged with dynamite. Sometimes dynamite is placed in an auger-hole bored into the main root. After the explosion the tree falls, or the earth around it is so loosened and thrown out that it is not difficult to finish felling the tree.

A correspondent of the London *Garden* writes with enthusiasm of the beauty of a second flowering of *Daphne Cneorum* in mid-November, and, truly, it is difficult to say too much of the delicate charm of this little plant even in our colder climate. After occasional blooms through the summer its autumn crop of flowers is sometimes quite abundant here also. Even as late as the 12th of December, this year, it was blooming in the neighborhood of New York, opening its flowers perfectly and giving forth a fragrance which seemed even richer than that of its spring bloom.

The Oak-leaved Hydrangea in Georgia and northern Florida, where it is native, sometimes reaches a height of fifteen or eighteen feet, with a habit almost tree-like. It is not perfectly hardy, however, north of New York, and in cultivation in this neighborhood it rarely attains large proportions, although it is beautiful both in leaf and in flower, and its foliage in autumn turns to a rich claret color. Mr. Meehan states that one of the finest specimens of this plant is growing in the old garden of Washington at Mount Vernon, where it was planted by Lafayette. If this is true, this specimen is probably one of the oldest in cultivation.

The pavilion planned by the State of Florida for the Chicago Exposition grounds will reproduce Fort Marion, supposed to be the oldest structure in the United States, which was built at St. Augustine by the Spaniards in 1620, the year when the Pilgrims landed at Plymouth. The reproduction will be constructed of wood, but covered on the outside with Florida phosphate rock, simulating the original stone work, this use of the material constituting the phosphate exhibit of the state. The deep moat which surrounds the old fort will also be reproduced, but will be utilized as a sunken garden, in which plants native to Florida may be shown.

Some twenty-five years ago there was a great impetus to fruit-growing in western New York, and in order to get as much as possible from the ground, Apple-trees were planted at about thirty feet or two rods apart each way. Now that these trees are of full size it is hardly possible to raise a ladder between many of them, and good judges think that much of the imperfection and lack of color in the fruit this year can be attributed to the fact that the proper amount of air and sunlight has been excluded. Mr. Irving D. Cook, of Geneva, New York, writes to the *Rural New Yorker* that in the judgment of the best growers in that region forty feet, or even forty-five feet, is not too far apart for planting Apple-trees, especially trees of winter varieties, if the best fruit as regards size, color and flavor is to be expected.

Smith, in his "Dictionary of Economic Plants," makes the following statement: "In a volume containing a miscellaneous collection by Dr. Richard Pocock, in the British Museum, is the copy of a letter written by Philip Herbert, third Earl of Pembroke, Lord Chamberlain, to the Sheriff of Staffordshire. It is as follows: 'Sir—His Majesty, taking notice that the burning of Ferne doth draw down rain, and being desirous that the country and himself may enjoy fair weather as long as he remains in these parts, his Majesty has commanded me to write to you to cause all burning of Ferne to be forborne until his Majesty be past the country. Wherein, not doubting the consideration of their own interest, as well as of his Majesty's, will invite the country to a ready observance of this his Majesty's commands, I rest, your very loving friend, Pembroke and Montgomery.'" Here is a hint for some of the rain-makers of our Department of Agriculture.

It is well known that among the prizes which Egyptian monarchs brought back from their foreign wars were exotic plants of many kinds, and that even large trees were transported for long distances to be set up in the courts of the temple-palaces. In Miss Edwards' new book, "Pharoahs, Fellahs and Explorers," we may find an account of such transportation illustrated by interesting pictures copied from the bas-reliefs of the great temple built by Queen Hatasu, near Thebes. In several of the best-preserved pictures we see the Egyptian sailors carrying half-grown saplings which have been taken up with a ball of earth about the roots, and are being transported in baskets slung upon poles, each pole carried by four men. Over the saplings is inscribed *Nehet Ana*—that is to say, the Sycamore of Ana. Elsewhere we see the full-grown trees. The trunk is massive, the leaf is a sharp-pointed oval, and at the junction of the trunk and the larger branches are seen little copper-colored lumps of irregular form, representing the resinous gum which has exuded through the bark. A passage in Pliny . . . shows that this tree, the odoriferous Sycamore, can be none other than the Myrrh-tree, whose gum was brought by the ancients from the so-called land of the Troglodytes, and, especially if of the green sort, was highly esteemed by the ancients as the material from which incense was made.

A pamphlet prepared by Dr. E. M. Hale, of Chicago, has just been published by the Department of Agriculture on the history and uses of *Ilex Cassine* (*I. vomitoria*). It is from this plant that the decoction known as "black drink" was made by the Indians of the Atlantic and Gulf states, and this paper contains much curious information about its ceremonial and economic use by the aborigines. The most interesting point brought out is that an analysis of the plant by Professor Venable, of the University of North Carolina, shows that it contains caffeine, so that this is really an aboriginal North American Tea-plant. Another species of Holly, *I. Paraguariensis*, furnishes the maté, or Paraguay tea, so that it is not surprising that this Yaupon, or Cassena, contains a similar alkaloid. Professor Venable's analysis of other plants of this family in North America shows no trace of theine or caffeine. Dr. Hale quotes many interesting passages from early writers to show the extended use of the Yaupon by the Indians. The leaves were roasted and kept in dry places, and there can be little doubt that it was an article of commerce, collected by the savages on the coast of North Carolina and sent to more western Indians and sold. Dr. Hale finds that an infusion of Yaupon-leaves boiled for half an hour gives a dark liquid like strong black tea, with an aromatic odor not like coffee, but more like Oolong tea, although without its pleasant rose odor. The taste is like that of our inferior black tea, quite bitter, and with little delicacy of flavor. It is not an unpleasant drink, however, and Dr. Hale thinks that one might become accustomed to it as to maté, tea or coffee. The Indians used to say that the drink prevented hunger and thirst, and the similar effect of Coca-leaves, used by the Peruvian Indians, has brought that plant into medical use. One author states that the Indians transplanted—that is, cultivated—this Yaupon. Dr. Hale concludes that a beverage which contains caffeine should fall into disuse and become forgotten is a singular fact. If it has any economic value the plant could be cultivated over a large section of the southern coast country, and would produce an enormous crop. Dr. Hale states that it does not grow more than twenty or thirty miles from the sea-coast, and that its western limit is found about half-way from the Louisiana line to the Rio Grande. A note from Professor Pammell, however, states that he has seen it at least a hundred miles from the coast in Texas, and in the "Silva of North America" (I., iii.) it is said to penetrate the interior to southern Arkansas and the valley of the upper Rio Blanco, in western Texas.

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Hemlocks in Winter.

IN our northern climate, with its long and often rigorous winters, the sight of evergreens is a comfort and delight. Their soft green masses seem to mitigate the severity of the season, and to temper the bitter blast. This the aborigines well understood, and in the depths of the forest the Indian built his winter camp, securely sheltered from the searching winds, which are the unendurable part of that tempestuous portion of the year.

Goodly is an assemblage of Firs and Spruces when skies lower and tempests howl, comfortable the aspect of a Pine wood, with its furry branches and brown carpet, when the bare twigs of deciduous trees are shivering in the northwest wind; but more impressive than all is the sight of a group, or forest, of Hemlocks, such as is depicted on page 607, with their bending boughs laden with snow, and their graceful forms emphasized by their regal border of ermine.

Growing, as they best love to grow, on a rocky northern slope, their majestic height is enhanced by the elevation on which they stand; their columnar trunks catch the light from above upon their snow-besprinkled bark, till the whole forest seems a Gothic cathedral, marble-roofed and pillared, with wild fret-work and intricate design of shaft and capital, cornice and rafter, buttress and corbel, sculptured like a shrine with fantastic forms, and built into a quaint wonderful series of aisle and nave, chapel and sanctuary.

To walk here gives a strange and solemn delight; the gray rocks take on grotesque forms in their white sheathing, the ground is like a mosaic floor beneath the feet, the winter birds chatter in the branches overhead, the great trunks, with their rough bark, show a rich hue amid all this whiteness. A snow-shower greets the traveler from the light branches stirred by the approach of man as he advances through the solitary wood. No wind reaches the sheltered region, but in the high snow-laden tops there is a murmur, the voice of the forest, the diapason of creaking bough, and sigh of stirring foliage shaking off its burden. New and lovely forms greet the beholder as he strays in this trackless wilderness, where the Indian of yore found protection and warmth for his wigwam built of the red-brown bark. The thought strays back to that time before the white man penetrated these wilds to drive the sachem and the squaw from their happy hunting-grounds, and he would gladly give a voice to the old trees to tell their story and recall the past, singing in runic rhyme some strange, wild legend of an older savage day. What more mysterious than the forest? What voice more vaguely impressive than its confused complaint? What poet may catch the echo of this melody and weave it into verse? To wander in a Hemlock wood is to commune with Nature, to listen to an unknown tongue, to struggle with the secret of the unspeaking trees, which suggest questions forever to man, but never reply, nor share with him their experience.

A single Hemlock, standing alone, with every curving line ridged with snow, through which the feathery green shines darkly, is a fair sight, a Christmas emblem, a tree of beauty. When the sun shines and the snow melts, a faint aromatic fragrance emanates from the dripping foliage, as if the tree were burning incense. This delicate perfume, full of soft suggestion, completes the charm of this wonderful tree, precious alike for nobleness of shaft and grace of branch and leafage, seeming forever to associate it in one's mind with that dear holiday of childhood, which is the solemn festival of maturity.

For the Hemlock is, above all, the Christmas-tree. Its perfume, whenever we inhale it, brings to our minds, not only a vision of the green wood, but a thought of dim and quiet churches wreathed with its boughs, of a deep chancel embowered in its branches, of joyous hymns from white-robed choristers, of the great angelic chorus,

Gloria in Excelsis Domino,

with which Christmas Day first dawned upon a waiting earth, and which echoes still in solemn chant of earthly voices from cloister and cathedral, from chapel and fireside, as year by year the happy day returns, on which we wreathe about the Christmas altar and the Christmas hearth the Hemlock-bough to give forth the sweet incense of its fragrance.

Then a vision of joyous little ones dancing around its gayly lighted form succeeds the solemn suggestion of its holy service, and our careless youth returns in memory, cheery and full of hope, or in maturer age we rejoice in the pleasure of our children and our grandchildren, as we gaze indulgently upon their frolicsome glee around this bearer of precious burdens.

So must this stately and beautiful Hemlock ever come near to our hearts, twined as it is with thoughts of praise and of generous giving; and with its undying verdure, its wide-spread, kindly shelter, its solemn loveliness, its breath of praise, it is a fitting emblem of the season with which it must ever be associated in our thoughts—the blessed Christmas-tide.

A FEW weeks ago we published the announcement of Professor Trelease concerning the examination of candidates for garden pupils at the Shaw School of Botany, in Saint Louis. It will be remembered that there are six scholarships in this institution, where young men can receive theoretical instruction in botany, horticulture, economic entomology, and enough of land-surveying and book-keeping to equip one to take charge of a large estate. The aim, however, of these scholarships is not to make botanists or entomologists, but gardeners; and as the only way to learn garden practice is by the practice of gardening, these young men will be employed in the work of the different parts of the establishment and receive pay for the same, besides having comfortable lodgings near at hand and free tuition. The pupil is expected here to learn the practice of small-fruit culture, orchard culture, forestry,

vegetable gardening, landscape gardening, etc., and therefore it is entirely distinct in its purpose from the horticultural courses established in the various state agricultural colleges.

We have lately received several letters to confirm us in the opinion that young men who now take a thorough training in horticulture, either at this Shaw School or under the instruction of skilled gardeners and the growers of choice plants, can easily find remunerative employment. There is an increasing demand for men who understand the cultivation of greenhouse-plants and who are familiar with the care of outdoor gardens. Besides this, seedsmen and commercial growers of high-class plants find it hard to secure men with sufficient practical knowledge to enable them to be efficient salesmen either of new introductions or of well-known plants. One of the letters to which we have referred states that there is general complaint among large dealers of the difficulty in securing thoroughly posted and capable salesmen; and while it is true that many of the gardeners in charge of greenhouses and grounds in this country are as good as can be found elsewhere in the world, there are others who have not sufficient knowledge or ambition to take the proper care of a fine collection of plants; and the owners of such plants are, therefore, discouraged from buying more or taking such an interest in gardening as they otherwise would. It is a well-known truth that there are comparatively few good gardeners or salesmen who are American-born. The greater number of the leading men who fill these positions have received their training in Great Britain, France, Germany, Belgium, Sweden or some other foreign country. Certainly Americans have as much natural aptitude for this work as have men of any other nationality. Indeed, some of the most skillful propagators and enterprising growers in the country are Americans. Why should not more of our young men prepare themselves for labor in this promising and useful field?

New England Parks.

DEERING'S WOODS AND THE PROMENADES, PORTLAND, MAINE.

WHOEVER has read Longfellow's "My Lost Youth" must have desired, at some time or other, to see "the shadows of Deering's Woods" for himself—those woods in which the gentle poet played when a child, and which he has embalmed in one of the most exquisite of his poems.

It is the privilege of the poet to thus secure immortality to some spot dear to his heart, and to make the name of that unseen region a household word even in distant lands. The steep brow of the mighty Hellvellyn will ever be a feature in the mind's landscape beside the Dowie Dens o' Yarrow and the Banks o' Doon. How many pilgrimages have Scott and Burns caused to view the ruins of Melrose or of Alloway's Auld Haunted Kirk? Is not all Scotland pictured to us in the ringing verse of Scott, till every loch and glen are dear to us, and Ben Nevis and Ben Lomond, Stirling Castle and its "winding river, twined in links of silver light," are as familiar to our imagination as the New England coast?

The Rhine—the poetical watchword of two nations—what wreaths of verse and legend hallow its hills and vineyards! How the yellow Tiber, with its tumbling flood, is a clear vision to the man who never hopes to see the "City of the Soul"; while the peaks and streams of ancient unseen countries live for us in the undying strains of the bards who have sung them, till Scamander and Simoïs, Olympus and the distant Caucusus, Avernus and the Stygian Grot, even the lone Corasmian shore, have a reality to our minds that no geography or history could impart, and dwell forever in our memories, embalmed in one sweet sonorous line.

What Washington Irving has done for the Hudson, what Whittier and Emerson have done for Monadnock and Chocorua, Longfellow has done for Portland—his native city—and for its pleasant woods. Forever in his verse will linger "the beautiful town that is seated by the sea," while we

> —can see the shadowy lines of its trees,
> And catch in sudden gleams
> The sheen of the far-surrounding seas,
> And islands that were the Hesperides
> Of all my boyish dreams.

Nor is it merely a poetic license to call the chief city of Maine beautiful; for whether approached by sea or land it has an impressive aspect, girt about, as it is, with waters, and overshadowed by fine Elms. Yet its full beauty cannot be felt until you explore the high peninsula on which it stands, really an island, since a bridge is its connection with the mainland, and see the continual rise from the encircling bay to the lofty centre, with shady streets ever climbing or descending hills, while from the high upper windows of many houses, far-away views of sea or mountain gladden the dweller in that favored town.

For some reason I had falsely fancied that Deering's Woods were to be found somewhere upon those heights

> o'erlooking the tranquil bay,

where sleep the dead sailors who fell in the famous sea-fight between the Shannon and the Chesapeake in the war of 1812; so that it was with surprise I discovered the old grove in a valley near the water, hard beset by screaming engines and partly belted by iron rails. I was disappointed, too, in the extent of this classic ground; for, though there are sixty-six acres in the city reservation, not all of it is covered with trees, and some of it is in a rough, unfinished condition.

The woods which were presented by the Deering family to the town in 1879 cover a space about as large as Boston Common, and consist almost entirely of Oaks, venerable with age and russet with the touch of autumn when I saw them. Drives wind in and out among the antique trees, under which the turf is fresh and green. The underbrush is all cleared away, and in the centre is a natural pond of pleasing contours, which is a beautiful feature of this easily accessible pleasure-ground.

It is to be hoped that the city will acquire a certain slope beyond the railroad-cut, which could easily be bridged over to connect it with the grounds; and I understand that more land contiguous is soon to be purchased to give greater importance to the proportions of the little park—for park the local newspapers persist in calling it, though far more preferable and hallowed is the homely name of Deering's Woods, given to it by the poet, or that other appellation by which it is still known to Portland boys—Deering's Oaks. It is neither large nor imposing enough to be properly called a park, and the old name fits it perfectly, while it seems to me that somewhere about its gates might be engraved the quotation from the well-known poem, which makes it classic ground:

> And Deering's Woods are fresh and fair,
> And with joy that is almost pain,
> My heart goes back to wander there,
> And among the scenes of the days that were,
> I find my lost youth again.
> And that strange and beautiful song
> The groves are repeating it still,
> "A boy's will is the wind's will,
> And the thoughts of youth are long, long thoughts."

So associated is her poet son with the city of his birth, that, as one walks under the overarching trees, it is pleasant to come upon Mr. Simmons' seated statue of Longfellow, at the shaded junction of several avenues, looking down "those well-known streets" which he as sweetly commemorates in his verse as "the black wharves and the slips," the "bulwarks by the shore," and that

> breezy dome of groves

which was the occasion of my pilgrimage to the dear old town, which cherishes his memory by preserving the spot he so highly honored with the undying tribute of song, as a perpetual playground for its children.

Even more important as a breathing-space to the sea-girt city is the fine system of promenades with which she has crowned her heights—wide, smooth drive-ways, from which the harbor is grandly commanded. Here on the eastern promenade you skirt ancient earthworks, and come out upon the esplanade where are the ruins of Fort Sumner. From this point you look upon the Back Bay and the city climbing its promontory, while due east is a great harbor with a peaceful opposite shore, and islands dotted with summer homes, and a view of Cape Elizabeth, which has many villas along its windy and sea-smitten coast, that are a favorite resort of Portland people. This high and breezy avenue is shaded by tall trees much dejected by constant exposure to northern blasts, but the outlook upon bay and land is imposing. This system of drives encircles the summit of the peninsula, which, from its lofty elevation, commands a great extent of country; but the western view is the finest of all.

Upon the western promenade front some of the best Portland houses, and perched on the side hill is the Maine General

Hospital, a large, admirably situated building, from which the patients must enjoy a noble sight, for here the eye wanders over a vast extent of level country, relieved by hills and distant homes, through which meanders the River Fore. In the far middle distance uprise the mountainous hills of Oxford County, blue and impressive, while in the remotest background, half-hidden by shifting clouds, loom up the peaks of the White Mountains of New Hampshire, Mount Washington clearly relieved with its unmistakable purple profile against a pale gray sky, and now and then veiling its head completely in drifting clouds. From November until May these peaks of a clear evening can be seen in white silhouette against the golden sky as the traveler leaves Portland by train or boat.

Such a champaign, diversified with near glimpses of the bay and the winding river which empties into it, with that vast hundred-mile stretch terminating in mountain-peaks, is a wonderful thing to look out upon from a busy and populous city. But there is a drawback to this fine boulevard which should not be permitted to exist.

Unfortunately, the steeply descending hill-side, clothed with scattered Pines, that intervenes between the Western Promenade and its great outlook, has not yet been acquired by the city, though the opportunity has been afforded by the heirs of the J. B. Brown estate to exchange this land for other lots lying in a different part of the town.

When I recognize how much public spirit is shown by rich men in Massachusetts towns; when I see the great gifts of land for parks made in Springfield, in Lynn, in Worcester, and even in little Plymouth, I cannot help hoping that a similar generosity may be found in Portland, and that like munificent gifts may be made to it by some of the inhabitants. But, failing this, it seems a lack of foresight in any town to relinquish such an opportunity as this for securing to its dwellers for all time so magnificent an outlook as that from the Western Promenade. Such a mistake would be forever regretted, until some day, at enormous expense, the city would see fit to repair its error by resuming control of the property and destroying the intervening buildings. The town has, I understand, but a limited time in which to come to a decision; but a city which has been, heretofore, willing to pay between six and seven thousand dollars a year for the construction and maintenance of its park system, cannot afford to draw the purse-strings between it and one of the finest views in the whole beautiful state of Maine.

So far Portland has been wise and generous in her outlay, and, with all the wealth of that thriving town to call on, it is not to be believed that she will be wanting to so great an occasion.

Hingham, Mass. *M. C. Robbins.*

Notes of a Summer Journey in Europe.—II.

NO doubt, Geneva is indebted for much of her wealth of American and other foreign trees and shrubs to the influence and work of her illustrious botanists, the De Candolles, who have always made the city their chief home. The Botanic Garden here was planned and arranged early in the century, by the first illustrious botanical member of the De Candolle family, according to what is known as the De Candollean system of classification, and although the garden is not large it is quite worth a visit from any botanist or horticulturist. It occupies a sheltered situation almost in the heart of the city, and is divided into a number of sections, each enclosed by low fences and intersected by numerous paths. On account of its limited area, there is not a great deal in it of much interest to an arboriculturist or dendrologist; in fact, the most interesting trees, about thirty-five in number, comprising twenty-five species, are crowded into six rows, covering a piece of ground less than two hundred feet long and sixty feet wide. This group is not within the systematically arranged enclosures, and it is said to have been planted in the second decade of the present century. Here, among others, are two large Gingko-trees, labeled as staminate and pistillate; a Cedar of Lebanon, with a trunk about twenty-eight inches in diameter at three or four feet from the ground, and a specimen of *Zelkowa crenata*, with a smooth trunk two feet in diameter. While this tree has very much the habit of some Elms, to which family it belongs, the bark looks something like that of the Plane-tree (Platanus), or it may be said to be even smoother, the old bark scaling off in comparatively thin plates. In a corner of the garden is a Paulownia, with the largest trunk of any tree in it, while a specimen of our Cucumber-tree (*Magnolia acuminata*) is the best and almost only representative of its genus.

The herbaceous collection is a fair representative one, in good condition and apparently well labeled. The labels mostly in use here are made of thick, heavy zinc, and are either tied to the plants or fastened to stout iron rods. The names are cut into the metal by an acid which is applied after the zinc has been covered with engravers' wax and the desired name written through it. The name thus eaten out by the action of the acid is afterward filled in with black paint, making a fairly indelible record, and one that is easily legible at close quarters. It is, however, rather a laborious and slow method of getting an ordinary written label. As in most Swiss and German collections, one of the chief prides of the garden consists in the rockeries, or collections of alpine plants, as they are called, although they are by no means limited to plants of the mountains. The rockeries here are arranged in a rather formal and inartistic way, comprising several symmetrical piles of stones and soil. The plants, however, were in a flourishing condition and showed good care. At the time of my visit (July 20th) most of the alpine plants had long since passed their flowering stage, but a few were still conspicuous, chief among them being Campanulas, Poppies, Rock-roses, Gentians, Sedums, various species of Dianthus, Statice, etc. High up in the cooler, moister atmosphere of the mountain-slopes many species were still blooming freely, while in the garden they had passed on to the fruiting stage.

Quite as interesting, in a way, as the Botanic Garden, and a place well deserving of a visit by any enthusiast in the study of alpine floras, and particularly the flora of the Swiss Alps, is the Jardin Alpin d'Acclimatation. This establishment was started in 1884, under the patronage of the Swiss "Association pour la Protection des Plantes," an organization started a few years previously.

The object of the association itself is to save from destruction the beautiful and rare native plants of Switzerland, many of which were so fast becoming exterminated by botanists, tourists, foreign plant-collectors, and, worst of all, by the native population, who had found a remunerative pursuit, first in the sale of the flowers, and then in the collection and sale of the plants, which were dug or torn up by hundreds and thousands. Among the methods of accomplishing the desired end, as stated in the articles of organization, are the following: By the example of its members; by issuing popular publications for the purpose of educating the public in the manner of raising and cultivating these alpine plants; by appeal to the civil authorities, and by encouraging the culture of the plants by regular horticulturists and others, so that they may become common.

The headquarters of the association is at Geneva, and branch societies are established wherever a sufficient number of persons can be found interested in the subject. An annual fee of about forty cents (two francs) is charged, and citizens of any country are eligible as members. The association publishes periodical bulletins and also issues catalogues of seeds and plants. The establishment of the garden is intended to assist amateurs and others in obtaining at a very small cost the seeds of alpine plants or plants raised from seed. As plants thus raised can be depended on to thrive if given proper conditions, it is the hope of the society that the incentive to tear the wild plants from their native soil may be greatly lessened; because, besides leaving the valleys, mountain-slopes and rocks denuded of their beautiful flowers, it is well known that only a very small percentage of these ruthlessly torn up plants ever live to bloom or get adapted to their new homes. An instance of extermination may be mentioned in the case of *Potentilla fruticosa*, which, though found all around the northern hemisphere, and once common in Switzerland, is not now found within the limits of the country, the last of it having disappeared within a few years.

The plan of the association seems a good one, and much good can be accomplished through its garden if it is efficiently conducted and its existence and aim become well known. At present the garden is small, and so are the means at command for conducting it, and no doubt much of the interest manifested and the success of the undertakings thus far is due to the enthusiasm of M. H. Correvon, the president of the association and the director of the garden. From the garden the true plant-lover or the mere souvenir-hunter may obtain good healthy pot-grown plants of the much sought for Edelweiss, with directions as to its culture, and also of the Alpine Rose or Rhododendron, of the Anemones, Cyclamens and innumerable other plants which contribute to make Switzerland so attractive to the traveler. The catalogue, however, will be found to contain the names of many plants not natives of Switzerland, as well as some which are not strictly alpine.

Among other objects of the association is the establishment of gardens or reservations in various parts of the high Alps,

where the native plants can be grown and protected in their natural habitat, with congenial climate and surroundings. One of these stations, started two years ago, is called the "Linnæa," and is situated high up at Bourg-Saint-Pierre, on the Grand Saint Bernard route.

The free use of trees for decorative purposes, apparently, prevails as much in Switzerland as with us. During my stay in Geneva the city was gayly decorated in honor of a congress of athletic societies, and, besides the usual display of flags, bunting, etc., immense quantities of greenery were used, being brought from the surrounding country and neighboring mountains. Both branches and young trees of the native Balsam Fir were used in great quantities, also some Norway Spruce and Swiss Pine, while the native Ivy (*Hedera Helix*) and the Box were the chief materials used in making up festoons and other trimmings.

Arnold Arboretum. *J. G. Jack.*

The Weeds of California.—VI.

THE *Convolvulaceæ* supply only two obnoxious members, one native, *C. Californicus*, and the European *C. Arvensis*. These are not hurtful as "bindweeds," but simply on account of obstinately holding their ground against culture plants by dint of their long root-stocks that penetrate the ground to great depths, and which it is impossible to kill otherwise than by exhausting them, keeping the persistently reappearing tufts of foliage constantly cut during at least one season. The native species, which is erect without creeping stems, is especially hard to subdue in the "black prairie" or adobe soils of the Coast ranges, and its pretty white flowers adorn many an abandoned orchard in the Bay country. The "convolvulus" is the most dreaded of the perennial weeds.

Cuscuta trifolii is naturally a much-dreaded pest in a country in which Alfalfa is so important; and it annually makes its appearance here and there, but is promptly checked by the simple expedient of close-pasturing for at least one season. Alfalfa-seed is usually required by the purchaser to be warranted "free from Dodder."

Of the *Solanaceæ*, *Solanum nigrum* appears as a weed in waste places or fields without being troublesome. The *Datura Stramonium* has been introduced, but makes little headway, and is rare, while the native *D. meteloides* maintains itself obstinately against cultivation in the great valley and in south California, taking the place of the "Jamestown weed." Its range is nearly co-extensive with that of one of the native tobaccos—*Nicotiana attenuata*—whose viscous stems and foliage combine with an unpleasant odor to render it objectionable in the fields it invades.

Of the *Scrophulariaceæ*, the only weedy accession from the outside is an occasional occurrence of *Veronica peregrina*. *Scrophularia Californica* is locally somewhat troublesome; *Mimulus lyratus* is an obstinate but hardly noxious guest on the black lands of the Bay region and elsewhere. The most troublesome member of the family is *Orthocarpus purpurescens*, which locally not only disputes the ground with grain in the Coast ranges, but must be strongly suspected of adding injury by semi-parasitism, etiolating the remnant of grain-stalks. The same must be suspected as regards several others of the same genus that are frequent among the grain, and in pastures in California, as well as of *O. campestris* of Oregon and Washington.

The cosmopolitan Brunella, though occurring in the mountain-pastures of northern California, obtains no foothold south of the Oregon line. *Stachys bullata* is locally troublesome in the Coast-range valleys; the intensely scented Trichostema (Camphor-weed) maintains itself in the cultivated fields of the warmer parts of the state as on its original ground, defying heat and drought, and playing the part of a "Tar-weed" very successfully. But no other Labiates can be counted as weeds.

The *Verbenaceæ* are represented only by *V. officinalis*, which, in the irrigated lands of the great valley and lower foot-hills, attains a vigorous development.

Of the *Plantagineæ*, *P. major* and *P. mollis* give some trouble in lawns and irrigated grounds, but cannot be considered generally troublesome. It is quite otherwise with *P. lanceolata*, which in company with *Setaria glauca* is the most formidable enemy of irrigated grounds and pastures in the foothills of the Sierra, and more or less in the adjacent portions of the Sacramento Valley. The Plantago frequently shares the ground evenly with the grain, and in company with the Setaria forms steadily increasing patches in the Alfalfa fields, until the whole ground is taken. Such ground is difficult to reclaim from these weeds so long as field-crops are grown.

Urtica holoserica, the tall, stout native Nettle, makes itself disagreeably conspicuous in low grounds; while *Urtica urens* is a common invader of cultivated grounds all over the state.

Of the *Euphorbiaceæ*, it is chiefly the decumbent tribe that represents the Euphorbias proper in the fields, notably *E. Serpyllifolia* of the east, and *E. albomarginata* and *E. ocellata* as natives. All these are popularly credited with curative properties against rattlesnake bites. *E. Lathyris* has locally escaped from cultivation, and is periodically brought forward as a much-needed remedy for the troublesome "gopher" *Thomomys umbrinus*, which, in sandy lands particularly, it really seems to abate materially, probably through the poisonous properties of its pleasant-tasting seeds.

The most universally diffused weedy member of the order, however, is the *Eremocarpus setigerus*, a broad-leaved, hirsute, spreading annual, commonly known under the name of Turkey weed. While it prefers light sandy soils, and is, therefore, more especially at home in the San Joaquin Valley, it is also found throughout the Sacramento Valley and within the Coast ranges, from Mendocino County on the north to San Diego on the south, and on the valley and mesa lands of the interior; it does not even omit the Mojave Desert, but there changes its dichotomous spreading habit to an erect one, and appears in large patches densely crowded with almost unbranched stems, as much as three feet in height; suggesting the use of its strong and abundant fibre for industrial purposes. The extremely irritating nature of the dust arising from the dry stems when handled would alone probably prevent such use. The extreme resistance of the plant to drought enables it to survive almost any other annual vegetation; but the ease with which it is killed, even by a kick at the root-crown, renders it much less objectionable than most other "summer weeds."

Sisyrinchium bellum, the handsome blue "star grass," is apt to overrun moist but overstocked pastures, and is sometimes not easily subdued.

Oddly enough, one of the "California Lilies," the pale blue *Calochortus invenustus*, is a veritable weed in some of the warmer parts of the state, where it persists in grain-fields, though without material damage. A Zygadenus is charged with poisoning lambs and their hungry mothers in early spring in northern California and Oregon.

Of weedy Grasses, the troublesome Chess, *Bromus secalinus*, is found here and there, as an importation with seed grain or packing straw; but it utterly fails to gain a foothold as a weed. Its place is, however, very successfully occupied by the corresponding plant of Europe, the Darnel (*Lolium temulentum*), which not only holds in the cereal fields a place similar to that held by the Chess in the east, but is in addition charged with the same sin of transforming itself at will, in unfavorable seasons, into the very grain of which it has usurped the place—wheat, barley, oats or whatever the crop may happen to be. The echoes of warm discussions on this issue, both in journals and in agricultural clubs, have hardly yet subsided, and there remains many a staunch believer in the changeling supposed to perform such surprising feats. Not the least amusing feature of this discussion was that Darwin was repeatedly cited as supporting and proving the occurrence of such transformations.

Bromus mollis finds the climate much more congenial than does *B. secalinus*, and, with *B. sterilis*, may be classed as a weed grass, common on roadsides and in neglected fields. But it has attained a wide importance as a more or less welcome successor of the native grasses on natural pasture-grounds, so completely adapted to the Coast-range climates that it may be found waving on the slopes as thickly massed as though sown on purpose. Locally it has been thus used, and is likely to become more popular since it has been found to be effectual in driving out the most dangerous enemy among the grasses of both pastures and fields—namely, the *Hordeum murinum*, variously known as Squirrel-grass, Foxtail and Barley-grass. This undesirable immigrant, while affording early green pasture for a short time, becomes a fearful nuisance so soon as its long-awned ears are developed. The bristly awns, provided like the paleæ with retrorse serration, accompany the three-flowered spikelets to the end; and the latter, being sharp-pointed at the base, adhere to and penetrate almost anything in the way of woolen or cotton materials from the sheep's fleece to ladies' dresses; they work up the nostrils of cattle and the laborers' sleeves to the neck, and generally make themselves obnoxious to a degree not easily surpassed by any plant outside of the tropics. Although an annual, its extirpation has proved extremely difficult; and the advent of a natural enemy in the Soft Brome-grass is therefore most welcome.

The Wild Oat (*Avena fatua*) is so generally diffused even in the remote portions of the state that it is commonly considered indigenous, since it is mentioned by the early explorers as covering the hill-sides of the Coast ranges as well as of the Sierra foot-hills. While an unwelcome guest in the grain-fields, it is highly esteemed for hay, despite its hirsute glumes

Fig 95.—Cypripedium reticulatum. The Plant.

that, when too ripe, sometimes give trouble in "choking" cattle not used to it.

Of the numerous Paniceous grasses that trouble the eastern farmer—the barn-yard grass, crab grass, feather grass, and the several Paspalums—not one seems to gain a permanent foothold in the fight for existence. Only the purposely introduced *P. halepense* (Johnson grass) has in some sandy soils proved an almost ineradicable pest. The *Setaria glauca*, however, is a terrible pest in the irrigated Alfalfa fields of the foot-hills, as stated above.

Of the various Poas only the *P. annua* can be counted as at all troublesome. The pestilent *P. Eragrostis* (*Eragrostis vulgaris*) does not maintain itself where introduced; and of the wild grasses all those comprehended under the general name of bunch grasses (mostly species of Festuca and Poa) not one troubles the farmer save by the difficulty with which the turned-up root-stocks decay under the arid climatic conditions.

The most widely troublesome grass is the native *Distichlis maritima* ("alkali grass"), which long maintains itself in "alkali" ground, particularly in the lighter soils, in which its long root-stocks penetrate to depths of several feet and propagate from any fragment of a few inches, especially in irrigated lands, resembling in this respect the Bermuda grass as known elsewhere. The latter, however, can, in California, do no more than hold its own where planted, except on the borders of ditches, for the reason that during the dry summer its runners are unable to cast root, thus preventing its spread.

The Eagle Fern, common on the northward slopes of the Coast ranges, maintains itself somewhat obstinately here, as it does in Oregon and Washington, but persistent cultivation for a few years overcomes it.

While the above enumeration seems, at first sight, to present the weed question as somewhat formidable in respect to the number of species concerned; yet, as matter of fact, "getting into the grass," that constant bugbear of the eastern farmer, confronts the California cultivator only in exceptional seasons; and with ordinary and intelligent care, adapted to the nature of the local weeds, he can usually rest from the weed war from June to November, or whenever the rains happen to set in. In the older-cultivated regions, in fact, the extirpation has frequently been so complete that, in the absence of the supply of vegetable matter usually furnished by plowing-in of weeds, the green manuring of the clean orchards and vineyards is being seriously taken in hand.

University of California. *E. W. Hilgard.*

Plant Notes.

Cypripedium reticulatum.

THIS very interesting plant, closely allied to the rare *C. Boissierianum*, although it has been in cultivation for many years, is seldom seen in flower. It has a remarkably robust habit of growth, although established plants have never yet attained such proportions as it reaches in its native home, deep in the interior of Peru, where its leaves often measure four feet in length, and the flower-scapes are three and four feet high. The flowers are large, and several are produced on a stem. They are of a pleasing green shade, reticulated with darker veins, and the finely fringed petals stand boldly out and measure five inches in length.

Mr. Hicks Arnold is the fortunate possessor of the plant figured on this page. It is growing in his collection in Eighty-fourth Street, in this city, in a moist and cool position. It has three growths; its leaves are two feet long, and it is thriving luxuriantly, although in a house containing a wide range of species, all of which seem to find their special requirements met, as they are in the best of health. *A. D.*

Cultural Department.

Sowing Seed.

THE last flowers of the Chrysanthemums are now hanging their heads. Even in a well-aired house weak necks are the rule with these plants so late in the year, and, naturally, this detracts much from their value, though the last of the blooms will come in well for bold Christmas decorations. The first of the early forced bulbs are now coming on, and the greenhouse is daily becoming more attractive. But I never thoroughly enjoy the greenhouse until the winter sets in in earnest and the seed-pans are brought out and filled; for propagation from seeds seems to me one of the most pleasurable parts of gardening. There is always the gentle excitement of securing seeds of promising plants, the studying of their possible peculiarities, the uncertainty of a good catch, and, this secured, the watching of the growth during the various stages to the mature plant, which is not always the most satisfactory part of the process.

From some observation I am inclined to believe that the successful grower from seed is born, not made. I have known a professional gardener to fail utterly with Beans, and I have known others for whom hardly a seed refused to germinate. Of course, the one did not think, but planted his seed in cold

Fig. 96.—Cypripedium reticulatum. The Flower.

earth, and gave them a good supply of water, and his imitators may be observed in many gardens in the early spring. The successful growers give their various seeds intelligent study, planting each in well-prepared earth, under proper conditions of warmth and moisture. While my friends appreciate my products, and do not decline to carry them away, they look askance at my seed-pans, which, from my point of view, is rather puzzling. Of course they all try a lot of seeds every spring, and usually imitate nature by sowing generously and reaping niggardly. The watering-pot generally does the business. Where there are no greenhouse facilities, altogether the best plan for the ordinary run of garden-seeds is to plant them in a frame in a warm corner, say, about the 15th of April in this latitude. Such a frame need be only four boards nailed together and covered with coarse sheeting, which, if oiled and inclined, so much the better. All but the most tender seeds will quickly germinate here, and need very little attention except a slight care in airing, and the annuals will be mostly ready to set out in the open as soon as the ground is warm. Any one who has had sowings in various places in the garden, each one of which must be protected from cats and hens, to say nothing of watching that they are kept properly moist, will appreciate a frame where they can be observed with a single glance. Of course, Poppies and such hardy annuals are better sown during the winter, mixing them with earth and scattering them over their destined beds.

There are many seeds of hardy plants which seem to do better under rather rough conditions, and seem to need frost or melting snow to start their germination. For seven or eight years I have had under observation the seeds of *Scilla Sibirica*, which are usually the first things to start in the garden under certain conditions. I have found that seedlings of these are never so abundant and so early as in those years when the trickle from melting snow reaches them. One year those in the border under these conditions germinated three months earlier than those in a cold frame, not quite free from frost but free from melting snow. While many seeds of hardy perennials will germinate as readily as those of annuals, it is not so as a rule, and the cold treatment (in a well-drained place, of course) will be found more frequently the successful one. For such seeds growers frequently expose the pans to snow and frost, and then bring them into a moderate temperature to sprout. But many of these seeds are so slow and irregular in their germination that in ordinary cases it is as well to leave them in the borders.

For pans of slow-germinating seeds I have had success in using burnt earth, which will stand for months without becoming mossy. This is prepared from clayey soil by heating to a red heat. These slow seeds not only weary all but the devoted gardener, but also the seedsman ; and it is slight wonder that they are kept in stock by few dealers. The demand is small, and they would be the source of endless complaints from disappointed growers. The seedsman may have his special sins, but I do not find that selling bad seeds is usually one of them. Not only do they find it profitable to furnish the best seed, but the majority of these have longer vitality than is usually supposed. A large proportion of them will be good the second year at least, and many longer. But there are enough which start too slowly for careless planters—a few hardy perennials which need special care—and of these seedsmen are naturally cautious. Seeds of some plants will preserve their vitality for one, two, three or more years, and then all go off, while of other plants one could tell the age of the seed by counting the diminishing percentages in the seed-bed.

Elizabeth, N. J. *J. N. Gerard.*

Rose Notes.

At this time of the year many growers are tempted to give some extra heat in the Rose-houses in order to secure a larger number of flowers for the holiday season. In most cases, however, they regret such action afterward, because the plants so treated lose much vitality by the operation, and consequently fail to respond later in the season when another crop is expected. Preparation for the holidays is best made several weeks beforehand, so that a crop may be brought on in regular order without injurious forcing.

Careful handling in the matter of temperature is also fully half the battle in forcing Hybrid Perpetuals, for too much heat will give either blind wood or else miserable, deformed buds, while the splendid foliage and flowers produced by many of the market-growers are secured by a careful system of gradual forcing applied to strong, well-rested plants. During mild weather some ventilation will be needed, bearing in mind the fact that the sun's rays are less powerful now than they will be a month later, and therefore but little ventilation will be required to keep the temperature within bounds. Of course, direct draughts should always be avoided. Applications of liquid-manure should be made with caution at this time, too, especially to young plants of the present year's planting, though two-year-old plants in benches and Hybrids in pots will require some such stimulant from time to time.

Cuttings of Tea Roses may be put in at any time during the winter and spring, but, if started now, good stocky plants will be secured for next summer's planting. Only a moderate degree of bottom-heat is needed for Rose-cuttings, and firm young wood, from which a flower has recently been cut, is the best material.

The new Tea, Waban, will doubtless prove a valuable Rose, and certainly it is a beautiful one when well grown, though during the present season it does not seem to strike the popular fancy in some of the larger flower-markets of the country. Fashion seems to favor light pink or rose-pink shades in flowers rather than dark or reddish pink. Of its free-blooming qualities there seems no doubt, but the growth this year is weaker and the flowers smaller than those of its parent, Catherine Mermet. It is quite possible, however, that this condition is due to over-propagation, and that its vigor may be regained after one or two seasons' growth. At present, plants of Waban can, in most instances, be distinguished from those of Catherine Mermet, where the two are planted side by side, by its smaller leaves and thinner wood, but it is very probable that these characteristics may disappear, for some of the flowers of Waban exhibited by its introducer last season were as large as the best flowers of its parent.

A tendency to sport has been developed in Madame Hoste in at least one locality, the sport having been in the form of a fine yellow flower, so deep and distinct from the parent as to match well-colored Perle des Jardins at a little distance. This sport was propagated and tested this season, but I was recently informed by the grower that it proved a failure as a novelty, the young plants apparently having reverted to the original variety.

Souvenir d'un Ami is a handsome old Rose when well grown, though comparatively little used of late years since the larger pink Roses have been more fashionable, but a bench of this variety a hundred feet long and a perfect mass of dark green foliage and long, pointed buds, such as I saw recently, was enough to delight any Rose-grower. The soil in which these plants were growing was light and sandy, and it is quite likely that this had something to do with their unusual vigor.

Holmesburg, Pa. *W. H. Taplin.*

Better Begonias Wanted.

The most enthusiastic admirers of this new race of plants have not gone beyond the truth in praising the brilliancy of these flowers ; a crimson, orange, yellow or white Begonia blossom, four or five inches in diameter, is certainly a remarkable production, when we consider from what it has been developed.

Yet I confess that they seem, to me, to leave much to be desired. I have grown, or seen, the best obtainable varieties sent out by Laing and others, and neither in the untried seedlings sold at a low price by the hundred, nor in the selected kinds which cost half a guinea each, do I find the admirable qualities possessed by the original species. The greater size of the flowers of most of the hybrids is not a merit sufficient to outweigh the entire want of grace which nearly all of these plants display, and their almost total lack of distinctness of habit is a grievous blemish.

Begonia Boliviensis was one of the first species introduced ; its flowers consist of long, lanceolate segments and hang downward. No committee would now give it an award of merit, or even tolerate it upon an exhibition table, but as I saw it last August, growing in a partial shade, bearing abundant foliage as well as abundant blossoms, I thought it much more attractive than a number of hybrids of good quality growing near it.

No tuberous Begonia has finer foliage than *B. Pearcei*, whose leaves of bright green, veined with a much darker shade, have the soft appearance of velvet, and, with the numerous bright yellow flowers, make a plant of great beauty. *B. geranioides* is a species unlike any other, with its tall flower-stems, carrying a mass of snow-white blossoms with yellow stamens, arising from the fresh, green foliage. It comes into bloom later than many varieties and retains its beauty several weeks.

No species can exceed *B. Davisi* in brightness. Excellent for pot-culture or for the open ground, it forms a low, dense tuft of leaves, surmounted nearly all summer by its scarlet

Fig. 97.—A Hemlock Grove in Winter.—See page 601.

flowers. A variety of this has flowers of a shade whose richness is not outshone by the Cardinal-flower. *B. discolor*, or *Evansiana*, has a beauty distinct from all others. Though it endures the sun very well, it is most attractive in the shade, where its large red-veined leaves assume a deep blue-green, and its panicles of pink flowers retain their beauty a long time. *B. octopetala*, on the contrary, does better in the sun. Its underground portion is different from what we find in other species, being a stout, creeping rhizome, which, in the course of a summer, will advance several inches, sending up leaves and flower-stalks throughout the season. This is a giant among Begonias, for its light green, circular leaves are sometimes a foot across—a yard around—and its flower-stalks, rising to the height of thirty inches, bear numerous white, round flowers, the first of which to open are three inches in diameter. This is the only species which ought to be planted before it shows signs of growth. M. Lemoine has hybridized this species with some bright-colored variety, but I have not seen the progeny.

Different from any of these is *B. martiana gracilis*. Its exceedingly numerous flowers are bright rose out-of-doors, pink under glass. If the tip be pinched out when the plant is six inches high, the side branches will be numerous, all stiffly upright, like those of a Lombardy Poplar. *B. Sutherlandii* is a very pretty species, especially if grown in a shady spot. It branches freely, forming a dense round bush, abundantly furnished with leaves of very elegant shape, and with buff or salmon flowers. It appears identical with *B. Natalensis*. *B. Dregii* (syn. *Caffra*) is also a plant of thick bushy form, but with fewer branches than the last mentioned, and with white clustered flowers. These two are useful for cutting, an unusual virtue in the tuberous group.

I have given a brief account of nine species, my design being to show that there is no need of confining ourselves to one form, and that a very ungraceful and awkward one, of tuberous Begonia. There is no reason why each of these types should not be developed (if development be desirable) without losing its distinct character. Begonias might thus be made worthy of a much wider admiration than they now excite.

Canton, Mass. *W. E. Endicott.*

Gall-worms Injuring the Roses.

COMPLAINTS have come to the Experiment Station of a shortness in the hot-house Rose-crop, and a recent visit to Madison, New Jersey, where Roses are grown in quantities for market, convinced me that the trouble was largely due to microscopic worms in the roots of the plants. The affected Rose-plants have a stunted, sickly appearance; they fail to send up strong shoots, and only develop short stems bearing pale leaves. The roots of such victims are much swollen in places, and these knots contain multitudes of minute worms akin to those sometimes found in vinegar, and called eel-worms. Such plants fail, of course, to produce good flowers, and are worse than worthless.

Like all root-pests, these eel-worms are difficult to reach with any remedy, and therefore preventive measures are the only ones that are promising. The worms flourish in a rich soil, and pass from the soil into the plant, and from one plant to another through the soil. It is, therefore, of great importance to have the soil used for potting plants or for the greenhouse-bed free from the worms, and, of course, none but clean plants should be used. The worms are easily killed by heat and cold, and therefore if the soil could be raised to a high temperature, the trouble would vanish. In like manner, soil that is frozen during the winter is less liable to contain the enemy than that which has been protected from the frost. In selecting soil it should, if possible, be that in which no garden-plants have been grown. The greatest trouble with the Rose-plant soil is probably the manure that is used in great abundance by the growers. It is likely that this manure is infested with the worms.

The experiment of raising Roses in a soil where stable-manure is replaced by a judicious mixture of commercial fertilizers is well worth trying. It has been shown, for example, during the present season, that Sweet-potatoes can be grown to great profit without the city manure, that has been the standard source of plant-food among truck-farmers. Also it has been demonstrated that Potatoes thus grown are less liable to the attacks of the various rots and decays so prevalent in many Sweet-potato localities. If the right mechanical consistency for the Roses can be obtained in connection with the commercial fertilizers, it is quite evident that the soil would be under better control and less liable to various infections.

Lime has been found inimical to the eel-worms, and therefore this substance may assist in keeping the plants healthy. The lime may be applied to the surface of the soil and carried down to the roots by the water that is daily applied. With Violets, which are much subject to the root-galls, it has been found that broken mortar, mixed with the soil, has been advantageous. Many of the substances that would be fatal to the worms also injure the tender roots of the Roses and cannot be used.

Those who have Rose-plants now dying from the worms should remove them all at once and burn them. The soil, of course, must be changed before another set of plants is grown, and the greatest care should be taken to reject every plant with root-galls, however small, when the beds are set. With these precautions and the use of lime, about all is done that is practicable, except, possibly, the use of commercial fertilizers in place of manure, but this practice needs to be proved profitable by actual trial among the Rose-growers. The fact that we have had warmer winters than usual during the past three years may have something to do with the overstock of eel-worms in the soil. A good freezing season may help to rid our outdoor soil of them. They are the plague of the garden and orchard in warmer climates, but here are most pestiferous indoors.

Rutgers College. *Byron D. Halsted.*

Notes from the Harvard Botanic Garden.

ARALIA SIEBOLDII.—This fine old plant has long been a familiar object in greenhouses, and its bold aspect is not likely to be forgotten by those who have seen large masses of the plant in the gardens of the milder portions of England and Ireland. As an outdoor plant it is much too tender for this climate, though it would probably thrive in favored locations from Washington southward. It is seen at its best when grown outside, where it develops into a bush from five to six feet high, and as many through, amply supplied with palmate, leathery, deep green, glossy leaves twelve inches across, on stout petioles of a similar length. It bears in summer numerous large clusters of small creamy white blossoms. In this part of the country, however, *A. Sieboldii* is essentially a greenhouse-plant, and with abundant space and liberal treatment it develops into a highly decorative specimen under glass. Where greenhouse space is limited small young specimens are the most useful. These are usually raised from seeds sown in heat, or the young plants obtained by cuttings from the half-ripened stems. Seedlings, however, make the most attractive specimens; but the seeds are not always easy to obtain. When grown to a single stem from one to three feet in height and furnished to the ground, few pot-plants of such simple requirements are more elegant. Repotting is not a frequent necessity, unless it is desirable to increase the size of a specimen. Pot-bound plants are easily kept healthy by the occasional use of weak liquid-manure, but the soil should never become soddened nor thoroughly dry. *A. Sieboldii* is an admirable plant for the dwelling-house, the thick texture and close surface of the leaves enabling them to withstand the dry air of such situations. Such plants derive fresh strength from out-of-door exposure during the summer. *A. Sieboldii* is a native of Japan, and was first introduced to Europe in 1858. It is most generally known under the name given here or *A. Japonica*, but the botanists now call it *Fatsia Japonica*, Fatsi being the Japanese name of the plant. There are two distinct varieties of the species: Variegata, with leaves bearing conspicuous blotches of white, and Aurea, which has a yellow variegation.

CLETHRA ARBOREA.—The Madeiran Clethra, or Lily-of-the-Valley-tree, ranks high among shrubs for the decoration of large conservatories. In lofty buildings dwarf plants can only be used as a fringe to the main groups of large specimens. Big, handsome plants, which need little garniture, are therefore a necessity in many gardens, and *C. arborea* is one that may be depended on for a good appearance. *C. arborea* was introduced to Kew in 1784 by Mr. Frederick Masson, and was formerly very popular in Europe. A half-dozen degrees of frost will not seriously inconvenience it, but the rigorous winters in this part of the country are much too severe for it. However, a well-lighted and airy house which excludes frost affords all necessary winter protection, and in summer a fully exposed position on the lawn will tend to ripen the new growth and produce abundant bloom. The pale green, oblong leaves of the plant are freely disposed around numerous branches, which terminate with large, slightly drooping, paniculate racemes of pure white fragrant blossoms. The inflorescence bears a striking resemblance to a spreading cluster of Lily-of-

the-Valley racemes; hence the popular name. Late summer or early autumn is the flowering season, but it may be retarded and prolonged for a considerable space of time by shading from sunshine. *C. arborea* does not flower freely unless the roots are well confined, and it can be induced to bloom when comparatively small by attention to this peculiarity. Of course, it must be supplied with food in the form of liquid-manure. The foliage soon loses its refreshing green if the soil about the roots is allowed to become dry, and it is the lovely contrast of perfect flowers and leaves which gives the plant its charm. Cuttings of firm young wood root easily in heat.

PHORMIUM TENAX.—This plant, well known as New Zealand Flax, deserves a place among fine-leaved greenhouse plants. It is without stem, and the straight leaves, bright green above and glaucous on the under side, from five to six feet long and two or three inches wide, appear in fascicles, radiating distichously from a common centre like the ribs of an extended fan. The branched scape, bearing insignificant yellow liliaceous flowers, is developed in summer, and exceeds the leaves in length by about two or three feet. The foliage, however, is the most attractive feature of the plant, and especially is this true of the variegated variety. In the latter broad stripes of yellow and white intermingle with the green of the leaves, giving the plant a very pleasing appearance against a dark background. There are several other forms of *P. tenax*, but the species and this variety are perhaps the best for general purposes. Both plants are very easily cultivated, and succeed well in any house from which frost is excluded in winter. In summer they thrive luxuriantly planted out in the garden, but they must be taken up early in autumn. The species makes the most vigorous growth in a rich sandy loam, but soil of a comparatively poor character should be used for the variety, by reason of its inclination to revert to the original green color. A cellar frost-proof and fairly light will answer for the storage of these plants in winter where there is no greenhouse. They are quite at home in porches and entrances at any season of the year, and when grown as house-plants they need no better position. I once knew two specimens which had been grown mainly in a hall-way for fifteen years. One was green, the other variegated, and they occupied twelve-inch pots, without a single change throughout all that time. They were placed outside in front of the house a few weeks in summer, during which time they received frequent doses of liquid manure and a top-dressing of fresh soil. The remainder of the year they spent in the hall at the bottom of a dark mahogany staircase, where they always looked well. No plant except, perhaps, *Aspidistra lurida*, will survive more ill-usage than *P. tenax*. The leaves are stiff, tough as leather, and therefore not easily injured, and they are unusually slow to resent neglect in watering. *P. tenax* was introduced to Ireland by a Mr. Underwood from New Zealand in 1798. It is very common in New Zealand, and its fibre is used by the natives in the manufacture notably of cordage. Considering the interest now taken in Ramie and other fibre-yielding plants by Americans, it is a matter of some surprise that *P. tenax* has not been tried more largely. The fibre appears to be easily separated. In 1822 a company was organized for the purpose of cultivating this plant in Ireland for its fibre, but the project had to be abandoned on account of the slow growth made by the plant under the climate of that country.

Cambridge, Mass. *M. Barker.*

Calanthes.—The season of these useful and brilliant Orchids has come around again, and we are more pleased with them than ever. The various tints of coloring of *C. Veitchii* contrast finely with the white varieties of *C. vestita*, *C. rubra* and *C. occulata*. A few plants set in between good specimens of *Adiantum Farleyense* in the warm greenhouse have an excellent effect. They take the eye at once, and give the house a bright appearance while they last, which few other plants can surpass. For cut flowers these Orchids are among the best. Not many spikes of *C. Veitchii*, with fifty flowers and buds on each, with Asparagus plumosus, say, for green, are needed to make a centre-piece for a dinner-table that ought to please the most fastidious. Florists ought to find profit in growing Calanthes; they increase rapidly, are no more trouble than Roses; they come into flower mostly after Chrysanthemums have faded and gone, and would be valuable for the holiday trade. They require an even temperature when in growth of not less than sixty-five degrees at night and ten to fifteen degrees higher in the daytime. They grow best in a fibrous loam, with a little thoroughly decayed cow-manure and a sprinkle of sand to keep the mass porous. The pots should be half-filled with potsherds, for thorough drainage is essential. The plants will bear feeding with liquid-manure after the fleshy roots have penetrated all through the compost and the young bulbs begin to form. They must be shaded from bright sun, and the long flower-stems carefully kept down from the glass.

A hundred plants in bloom at once, with fifty flowers and buds on many of the stems, present a beautiful appearance, and such a display can be seen now in the conservatories of Mrs. J. W. Lasell in this town.

Whitinsville, Mass. *W. S.*

The Forest.

The Subjection of Torrents by Reforestation of Mountains.—III.

CORRECTIVE WORKS.

THESE may be considered as barriers, drains and rectifications of the bed.

The barriers, whether of dry masonry or of hydraulic mortar, of timber or of living wicker-work, all have, as an object, the enlargement of the section in such a manner as to ultimately permit the establishment of a fixed and definite bed, preventing all erosion, and giving a solid support to banks otherwise unstable. Their deposits may be used to build up the old bed, by forming a series of stairs across the channel, and thus reducing as much as possible the great first cost of dams. These secondary works, judiciously employed, may even be retained among the greater works which it will be necessary to maintain continually, and thus reduce the number of the latter. The dams of the first class, besides this principal function, have the effect (1) of breaking by the falls they produce the rapidity of the water-flow, and preventing a sudden concentration in the main channel or in the river to which the torrent is tributary, and (2) of holding back above them the coarse material which formerly was carried into the valley below.

In addition to important works of the first class constructed in the principal bed of a torrent, there are placed in all its branches a series of rough barriers of rip-rap, so that the whole upper basin is under control before a specific correction of the channel is undertaken below. The value of this method, both as regards economy and safety, has been sanctioned by nearly twenty years' experience.

The number of important works of the first order, their forms and their dimensions depend upon the special character of the torrent under consideration, and it sometimes happens that the most powerful torrents require fewer great engineering works than certain others of an inferior development.

So far as the rough barriers are concerned, experience has shown that in many cases they may be widely spaced, especially in those places where the deposits are of rocky material. In certain ravines the deposits have a slope of twenty-five to the hundred, now held in place by vegetation. The little wicker-work dams in the small ravines can only be employed where the slope is less than one to five. Covering the bed of the channel with branches, or even with trees, piled two or three meters thick, with the tops up-stream, has been substituted where the slope is steeper. This system, in use about eight years, has quickly furnished most valuable results in the immediate correction of gullies.

Drainage, cautiously tried at first, has assumed a great development during the past ten years, since its effects have proved so striking in some torrents. These drains are superficial and much ramified. They were first tried with the object of giving the waters from melting snows or torrential rains a rapid and immediate flow toward mains on the line of the greatest slope, but they proved of greater and more permanent value than their projectors had dreamed. The earth, formerly unstable, wherever a corrected bed had first made the base firm, was found quickly safe from saturation, and the forestation of the bank or of the slope could at once be proceeded with. Conclusive experiments have been made during the past few years over an area of about 5,000 acres, which are to-day dry and solid.

The practice of rectifying the beds of torrents after a preliminary treatment has been largely developed, especially where the transverse profile of the torrent presented a suitable width and the longitudinal profile a pitch not exceeding twelve or fifteen to one hundred. The treatment consists of ranging at the foot of the banks rocks which will ward off the current and thus form a good defense for the shore. The new bed once outlined thus, is fixed by means of rude walls of large blocks, tending to guide the waters in the desired direction and checking all erosion, whether lateral or longitudinal. This very economical method requires continued attention for a

number of years, for which a force of well-trained men is needed.

The extinction of a torrent once accomplished, the complete reforestation of the treacherous basin will have the result of transforming this once-destructive agent into a beneficial mountain brook. After this it will be possible to decide upon the works which it may be necessary to retain and keep in order. For the rest it will suffice to open a free passage for the water through their centre, and to take up the differences of level by a series of small rough sills extending across the new bed, while the alluvium will soon be covered and fixed by a vigorous forest-vegetation. In this way the torrents are reconstructed into clear and harmless mountain streams.

I shall now cite some examples of forests treated by the adopted method.

THE TORRENT OF BOURGET.

This torrent empties into the Ubaye just above Barcelonette. The crests of the mountain from which it flows rise to an altitude varying from 2,900 to 3,000 meters, while its foot has an altitude of only 1,200 meters. The first operations began in 1870 with the reforestation of all the stable lands of the basin by sowing and planting *Pinus Cembra* in the higher region—that is, above 2,400 meters of altitude; *Larix Europea* and *Pinus montana* in the middle region, between 1,700 and 2,400 meters, and finally of *P. Sylvestris* in the lower region, between 1,400 and 1,700 meters. Woody vegetation has now taken possession of all the basins formerly denuded, and the young forest which has been absolutely created is increasing from year to year.

The unstable lands have been fixed by a series of corrective operations begun in 1872. The source of the torrent is at an altitude of 2,936 meters, and the profile of its bed is divided into three well-marked sections. The upper section, the catch-basin of the torrent, is 2,100 meters long, with an average pitch of 54 to 100. In this section the rock is hard, and the banks relatively stable. The middle section, constituting the drainage channel, flows exclusively through Jurassic marls, where the torrent erodes at will, and causes most disastrous washes by undermining banks and starting land-slides from the principal slopes. The length of this section is 1,764 meters, and it has an average pitch of 26 to 100. The third section, formed by the cone of detritus, has a length of 1,283 meters. It is more nearly level, and has an average pitch of 9 to 100.

The principal works of correction have been confined to the second section. Altogether they required the construction of twenty dams of masonry varying from 3 to 8 meters high. The subjection of the Bourget has been assured for more than nine years by a young forest of 988 acres, which occupies the upper basin. This result has been attained in fourteen years.

Correspondence.

Botanical Exhibition of the Appalachian Club.

To the Editor of Garden and Forest:

Sir,—The Appalachian Mountain Club has just held in its rooms in Boston an exhibition of plants prepared as herbarium specimens. As such exhibitions are none too common, a short notice of it may be of general interest.

The specimens were all mounted, with the exception of a few cryptogams—Lichens and the like. As many as possible were displayed on the wall, but a great number had to remain in genus covers, owing to the unfortunate lack of available wall space. This insufficient space necessitated covering the walls almost from floor to ceiling in order to make even a partial display of the collection, and therefore fully one-third of the plants shown were so hopelessly "skied" that it was impossible to examine them except with an opera-glass. A botanical specimen is not like a picture, where distance often lends enchantment to the view. It needs to be examined closely, if at all.

Of three rooms occupied, one was devoted to a large collection of Ferns from various parts of the world; another was filled with a collection of plants from California, supplemented by a set of colored outline drawings, an excellent adjunct to an exhibition of this nature. In the third room was shown a miscellaneous collection of flowering plants, Mosses, Lichens, Hepaticæ and Algæ. Altogether, there was enough material to occupy for some time the attention of any one interested in botanical subjects, and many visitors availed themselves of the privilege here offered.

It may seem ungracious to be critical in regard to such an informal exhibition, and yet it may be of service to point out a few defects. Much pleasure and instruction can be gained from such exhibitions, while, as object-lessons, their value is beyond question. But, of course, the work must be carefully planned and carried out if these desirable results are fully achieved.

In this case the whole exhibition displayed a lack of system. Some attempt had been made to arrange the plants in different genera, especially among the Ferns. The whole result, however, gave the impression that a number of people had been working each on a different plan. The genera appeared and disappeared in a most provoking manner, and many an important genus seemed wholly unrepresented, unless, perhaps, in the regions near the ceiling or somewhere in the genus covers. Mixed with the general collection, but without any general plan, appeared several special collections that it was desired to keep together, and altogether it was difficult for an observer to find any special plant without assistance.

It may well be questioned whether a local exhibition of this kind should not give a local collection the place of prominence, and admit other plants only in the form of special collections, as seems to have been actually done in the case of the California plants. Visitors are likely to be more interested in the plants of their own part of the country than in stray specimens and insufficient collections from here, there and everywhere. A good general collection is much beyond the scope and attainment of any small exhibition of plants, and a poor one serves more to gratify idle curiosity than to give instruction. It would, therefore, seem better to have some definite purpose to accomplish, such as showing the flora of a special region, or special plants for some marked object. From this point of view, the exhibit of our poisonous species of Rhus (under glass), together with some of the plants most resembling them, was most commendable. The wonder is that some one did not also make a special exhibit of our plants poisonous to the taste.

Unfortunately, it must be said that some determinations were open to suspicion, some were questioned, in many cases there were no names at all, in many more no specific name was given, and in a few cases the common English name of the plant seems to have been thought sufficient. Such errors could be avoided by providing for a careful inspection of all plants contributed under the supervision of some one of recognized botanical standing.

Again, there was too much disregard of ordinary care in preparing and mounting the specimens. Many of the labels lacked neatness; different varieties of a plant were mounted upon the same sheet, and in some cases not only two or three different plants were mounted together, but a whole flower-garden with not even a label to guide the observer through its mazes.

In spite of these manifest short-comings every visitor must have been impressed with the great promise that this venture gives, and must have felt grateful for the perseverance shown by the club in its first attempt. The more undertakings of this kind we have the better. If properly conducted, they can do great good by arousing a healthful and practical interest in our native flora. May this exhibition, therefore, be but the beginning of many in the years to come.

Boston, Mass. *Edward L. Rand.*

The Acorn Crop near Chicago.

To the Editor of Garden and Forest:

Sir,—In the issue of Garden and Forest for October 21st information is requested about the acorn crop in different parts of the country. Having been closely studying the Oaks of this vicinity for some time, the fruit has received a good deal of attention on account of its importance in the determination of species. Hence any great change in its amount, and particularly any failure, would have been observed. But no failure has been noticed, though in the case of the Bur Oak, which is more immediately concerned, it has seemed less productive than usual the past season. Besides this, the forests are supplied with the White Oak, Swamp White Oak, Red Oak, Black Oak, Scarlet Oak, Yellow Chestnut Oak, Shingle Oak and a hybrid of the last with the Black, or Scarlet Oak, much like *Quercus Leana*. These are all of whose presence I am certain, or familiar with in this region. All have been carefully studied, and, with the exception of the last two species and the hybrid, are abundant or common, though the Red Oak and Swamp White Oak are more restricted in their habitat than the other common kinds, and not so generally met with. On all biennial-fruited Oaks the acorns were very abundant last fall, as they are nearly every year. The annual-fruited kinds have seemed to me more changeable and uncertain in

their crop, though I recall no complete failure in any of the common species.

A year ago a group of the Yellow Chestnut Oak (*Q. Muehlenbergii*) practically failed. The trees are small and occupy a limited area. Some of the leaves having been found to bear a strong resemblance to those of *Q. Prinus*, the acorns seemed necessary in order to be certain of the species, and very diligent search on every tree revealed but three or four, just enough to determine the point. The past season plenty of acorns were seen on several of the same trees, as was the case with some in another locality where I had not met with them before.

On some of the Scarlet Oaks the acorns have been exceptionally abundant. Small trees, developing from stool shoots ten to twenty feet high and standing in open places, were so covered with fruit as to suggest a different kind, and were doubtfully identified at first. The acorns were borne in bunches, being massed upon the crowded twigs and near the ends of the branches, and the specimens were sufficiently exceptional to merit a place in my herbarium with the descriptive note made at the time, "Remarkable for the number of their acorns." Small trees of their habit are very handsome, from their compact rounded top, glossy leaves deeply divided into narrow lobes, and fruit grouped in bunches.

Another fact relating to the acorn crop here deserves a passing notice. It is the large percentage injured or destroyed by the Nut-weevil. Fully fifty per cent. were tenanted by the grub or had been abandoned after the meat was eaten out. Having traversed a good many miles of Oak forest, more particularly to find out what might be reliable characteristics of *Q. tinctoria* and *Q. coccinea*, for their forms must either cross or blend imperceptibly, acorns were everywhere taken in hand and examined in various ways, so that the destruction was seen to be very general. The case was even worse with the Shingle Oak and the hybrid, fully three-fourths of the latter, gathered for planting, having to be rejected. Other kinds were not examined so carefully or extensively, but as far as they were observed they were very badly affected, the Red Oak, of the biennial-fruited species, evidently being the least injured. It shows what havoc the Nut-weevil could work with the profits of an acorn crop, if it should be taken as an economical product, as it may be where mast forms an article of food for domestic animals.

Englewood, Chicago, Ill. *E. J. Hill.*

Uncommon Varieties of Apples.

To the Editor of GARDEN AND FOREST:

Sir,—Some time ago one of your correspondents asked why farmers and orchardists insisted upon planting so few kinds of Apples to the neglect of other and, in some cases, better varieties, and urged planters of new orchards to get out of the old ruts and introduce a little new blood. Well, the trouble is not wholly with planters. As a matter of fact, it is extremely difficult to get trees of any except the old and approved sorts, for which, perforce, there is a steady demand, since a farmer must either take these or nothing.

For example, this fall I wanted to set out a little orchard of winter Apples, and, bearing in mind your correspondent's suggestion, I searched the "Fruit Garden" and the "American Fruit Culturist," the best authorities I know on the subject, for new kinds. One of those selected was Cogswell, a Connecticut fruit, which seemed exactly what I wanted. Then began a hunt through the catalogues, which I procured from half a dozen of the largest nurseries in the country. But not one of them sold Cogswell. Another Apple I wanted was Winesap, but one of the largest nurseries in western New York could only undertake to supply twenty-five trees. Bailey's Sweet was another kind which they could not furnish at all, although it was included in their catalogue. I have had the same experience with other varieties, and one evident reason, therefore, why we planters don't go outside of the old lists when selecting trees is, that the nurserymen have no other kinds to offer.

Another Apple I would like to try, principally for its color, is Arkansas Black, which is very highly commended in a recent report of the Agricultural Bureau; but I can find no trace of it in the catalogues at hand. The same is true of Princess Louise, which has been highly spoken of as a substitute for the Snow Apple.

By the way, can any of your readers state anything definite about the new Apple, Palouse?

New York. *N. D.*

Recent Publications.

Sharp Eyes: A Rambler's Calendar of Fifty-two Weeks among Insects, Birds and Flowers. By William Hamilton Gibson; Illustrated by the Author. New York: Harper & Brothers, 1892.

The quotation with which Mr. Gibson prefaces his book says: "In good soothe ye are all blinde except thy minde and eie do see in harmonie. . . . Verily, there be those who see not though they doe looke, who, having eies of great bowinge, yet walk abroad in staringe blindness." In the introductory chapter we find another quotation,

> We're made so that we love
> First, when we see them painted, things we have passed
> Perhaps a hundred times, nor cared to see,

and by these two borrowed statements the purpose and character of Mr. Gibson's volume are well explained. He has tried to put what his own sharp eyes have seen before his readers, rightly believing that in this way their own will be sharpened to their lasting future delight and improvement. The many little chapters which the book includes—one for each week throughout the year—were written, he explains, in reply to letters received during ten years or more, chiefly from young students of natural history who had been interested by his previously published works; and they were first printed in the pages of a young people's journal. Nevertheless, the book is not for young people only. It is for all those who are still young in knowledge of the world of nature, and it will be pleasant reading even for students of a more serious sort than Mr. Gibson professes himself to be. Following his pretty and suggestive calendar from year's end to end, even the practiced, sharp-eyed naturalist may find some facts that are new to him, or have been observed in a novel way; and if this is not the case, even so he may find pleasure in living a while outdoors at second-hand when corporeally cooped up in a city's streets.

A good deal of gentle sentiment is mingled with Mr. Gibson's recording of minute, evanescent or more obvious phenomena; but this, of course, increases the value of his book to beginners in the gentle art of attentive sauntering. The best results of a developed keenness of sight are a developed intelligence and a developed heart; and, showing how the sights of the outdoor world led him to pretty, tender, fanciful and sometimes poetic thoughts, Mr. Gibson will help to awaken a similar capacity in his readers. Natural history, in the true sense of the term, cannot, of course, be learned from such a book; but it should inspire one with a desire to learn something at least about some one branch of it, and even if this does not result, it cannot but increase the reader's sharpness of vision and consequently his daily pleasure in existence. Mr. Gibson has been wise in recognizing this as the character of the service which could be rendered with a scheme such as he adopted; he has been wise in not trying to cram his pleasant talks with scientific terms, or to dwell upon such interesting and beautiful sights as can be discovered only by a closeness of sustained observation amounting to strenuous study. He shows us such things as we all may see any day in the woods and fields, if we use, in a simple, natural and easy way, the eyes that nature has given us. Yet he has been equally wise in giving the scientific names of the plants and living creatures he mentions. The insertion of these names will not bother the most careless reader, while they will greatly help the reader who may desire to follow a subject further. For, it is hardly needful to explain, common names vary so much in different parts of the country that it is often hard to identify a plant by their aid alone.

"Sharp Eyes" is a large octavo, beautifully printed, prettily bound, and profusely illustrated with photogravure reproductions of wash-drawings in Mr. Gibson's well-known, graceful, delicate and charming if not very vigorous manner. It is a very attractive volume for a holiday gift; but it surpasses most books of this sort by having genuine value as a volume to read. Perhaps it will not often be read through from end to end. More likely it will be taken up now and again for the sake of two or three of its little chapters. But this merely means that the pleasure it gives will be more prolonged, and that its influence in sharpening the mind as well as the eyes will be all the greater for frequent renewal. In the city it will be a charming reminder of the country, and in the country a charming incentive to outdoor enjoyment.

Notes.

In the Philippine Islands, canary seed obtained from *Phalaris Canariensis* is ground and made into a most palatable bread, which is in common use among the people there.

A Cocoa-nut tree that weighs six tons is to be transported, it is said, from Honolulu to a public park in San Francisco.

In Ferguson's "Information Regarding Ceylon," it is stated that one of the Palms of the island, the so-called Palmyra Palm, can be used for five hundred different purposes.

A remarkable Orchid, says the *Revue Horticole*, could recently be seen at the château of M. Pauwells, at Bosterlaer. It was a plant of *Oncidium divaricatum* bearing a flower-stem ten feet in length and no less than 784 flowers.

The bark which annually scales off the thousands of Plane-trees in Paris is carefully collected and sold, at one franc for seventy-five pounds, to the manufacturers of colors and chemical products. When boiled, it also furnishes a very astringent decoction, which is useful in compresses on wounds, burns and chilblains, and even on the bites of venomous animals.

At his recent visit to Philadelphia, Mr. John Thorpe secured for the Columbian Exhibition the promise of some large specimen Palms from the collection of Mr. G. W. Childs, and also some rare specimen plants from Mrs. Baldwin. Some of the large Ferns and Palms in the park conservatory, which were placed there during the Centennial Exhibition, will also be forwarded to Chicago.

A late number of the *Gardeners' Chronicle* contains a full account of the Orchids to be found in the British branch of the United States Nurseries at Hextable, Swanley, Kent. The Cypripediums are accorded the place of honor, which they also hold in the collection of Messrs. Pitcher & Manda at Short Hills. A Chrysanthemum-house, one hundred feet long, was reported as making a gorgeous show, and the white Carnation, Lizzie McGowan, came in for special commendation.

The Linnean Club, of whose good work in securing a park for the town of Jamaica, Long Island, we have already spoken, has arranged for a course of six illustrated lectures on plants and vegetable life, to be given by Dr. Morong, of Columbia College, under the University extension plan. The lectures will begin in January, and they will be followed in the spring by lectures on some branch of practical horticulture. These lectures are open to the public at a nominal price, and it is hoped that they will stimulate the growth of a public sentiment favorable to the objects which the club was organized to promote.

We have received several letters from growers of Carnations in various parts of the country in relation to the rust which was referred to in our last number by Professor Halsted. In some cases sulphate of copper has been used with good results, but in other cases, where, perhaps, the solution was too strong, it ruined the plants. There seems to be a great difference in varieties as to susceptibility to the fungus. On some varieties the fungus has not yet appeared at all, although they are growing by the side of infected plants. In one letter the varieties Annie Webb and Florence are spoken as nearly rust-proof. It would be interesting to have a list of the varieties which seem to be the least easily affected. We hope to publish in an early issue some further particulars in regard to this disease.

"Few of our native trees," says a writer in *Meehan's Monthly*, "have odoriferous wood like the sandal-wood of the islands in the Pacific Ocean; but a few of the coniferæ of the Pacific Slope have sweet-scented woods. The fine church at Metlakatla, built by the civilized Indians of Alaska, is as fragrant as if incense were continually floating through the air, from the wood of the great Arbor-vitæ (*Thuja gigantea*), of which it is built. *Libocedrus decurrens*, found further south, is known as 'Incense Cedar,' from its fragrance. The Yellow Cypress (*Cupressus Nukœensis*) and the Monterey Cypress (*C. macrocarpa*) have also scented wood."

Writing of the great Banyan-tree in the Botanical Gardens at Calcutta, Bishop Hurst says, in his "Indika," that the central trunk is fifty-one feet in girth, and that many of the one hundred and seventy smaller trunks have reached considerable size. "The process of cultivating the tendency of the Banyan to multiply itself," he adds, "is highly interesting. A slender root-like shoot is thrown out from the lower side of one of the branches and grows rapidly downward. Its lower end terminates in a small tuft of delicate rootlets, ready to strike into the ground as soon as they reach it, but, at the same time, presenting a tempting morsel to any goat which may pass beneath the tree. For the double purpose of protecting from the goats the slender stem which is to develop into a large trunk in a few years, and also of encouraging its growth, it is encased in hollow bamboo and fastened to the ground. It very quickly finds its way down the dark little cavity in the bamboo, and when once it becomes rooted in the earth its career is fairly begun, and it becomes the one hundred and seventy-first trunk in the vast system called the Banyan-tree."

The tenth annual meeting of the American Forestry Association, to be held at Washington on the 29th and 30th of this month, promises to be one of especial interest. Papers will be read by Mr. B. E. Fernow, Chief of the Forestry Department; President Adams, of Cornell University; Gifford Pinchot, of New York, and J. D. W. French, of Massachusetts. There will be a special meeting in the afternoon of the first day, in which the Executive Committee on the Establishment of National Reservations will report, and the Secretary of the Interior and the Commissioner of the General Land Office will be present and take part in the discussion. The meeting also will be attended by Senators and Representatives who have expressed an interest in the matter. President Harrison has assured the friends of forestry that he will give the broadest construction to the law which authorizes him to set apart these reservations, but it is well known that the mere act of reservation will accomplish but little unless it can be followed by the establishment of some rational administration of the territory. It is therefore proposed to memorialize the President and recommend further reservations, and also to recommend further legislation for their future management.

"If we were to make a suggestion independent of the architectural merit of the various buildings," said a recent editorial note in the *American Architect and Building News*, referring to the constructions proposed for the World's Fair at Chicago, "it would be that the Horticultural Hall . . . would probably be the most useful of all as a permanent structure. Even now, all our large cities contain enthusiastic horticultural societies which hold frequent exhibitions in the largest halls they can hire, and find their exhibitions crowded with people." The great success of the recent Chrysanthemum show at the Madison Square was then described, and the writer continued: "In fact, all over the country, Rose shows, Chrysanthemum shows, fruit shows, Orchid shows, winter flower shows, summer flower shows, spring bulb shows, Azalea shows and Rhododendron shows, and so on, follow each other in rapid succession, and the universal complaint made with regard to them is that no place can be found large enough to show all the good flowers that are offered, and accommodate, at the same time, the people who wish to see them. For Chicago, the Columbian Horticultural building would give exactly what is needed, and in exactly the right place, and it would add very little to the cost of the structure to make it permanent. It is to be remembered, also, that a building of this sort can be used for many other purposes besides exhibiting flowers."

Professor H. L. Bolley, of the North Dakota Experiment Station, has just issued an interesting bulletin on the Potato-scab, giving the details of experiments, which confirm his previous work and that of Professor Thaxter in Connecticut. There seems no longer room for doubt that the cause of the disease is a bacteroid fungus. It also appears that seed-tubers affected by this scab will produce a diseased crop, and that seed-tubers free from the diseased germs will produce a healthy product in any kind of soil, provided only that the soil itself is free from the germs. The germs of the disease can probably be killed without injuring the growth of the Potato, if the seed-tuber is treated with a solution of corrosive sublimate of the proper strength. But, after all, the disease-germs will remain in the ground, from crop to crop, for at least five years. Of course, it follows that when seed-tubers free from the disease are planted upon new ground the crop will be healthy, but this land will only remain free from disease so long as uncontaminated seed is planted there. Care also should be taken as to the kind of manure used, for the refuse from infested plants will certainly contaminate it, and implements which have been used in infested soil should also be thoroughly cleansed before they are used in the uncontaminated land. Professor Bolley has also discovered that Beet-roots have been attacked by a plant-parasite which is apparently identical with that which causes the scab of Potatoes. The affected Beets which were examined came to the station from various parts of the state, but in every instance, so far as could be ascertained, they had been planted on land where potatoes had been a previous crop. The disease on the Sugar Beets appears to be more extensive than it ever has been in the Potatoes. It seems also that the Swedish Turnip, Carrot and the roots of Cabbage are affected by the same disease. It now becomes of interest to know whether this scab of Potatoes is a disease common to all root-crops.

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The Old Age of the Year.

THE mildness of the recent season has made the usually cheerless month of December a period of enjoyment. Sunny skies and a warm temperature enduring until the holiday season have rendered outdoor employments not only possible, but agreeable, even during the very shortest days of the year. Fortunate are they who have taken advantage of this opportunity to complete the delayed tasks which properly belong to autumn. The unfrozen ground has permitted the transplanting of trees and shrubs, although late labor of this sort is of doubtful propriety. The planting of trees in autumn should be completed early, so that the roots may have time before deep freezing to throw out feeders to supply the moisture which drying winds absorb from the limbs all winter long. On the other hand, every hour has been well spent which has been devoted to the preparation of the ground for spring-planting. Large spaces deeply-trenched for trees will have time to settle and solidify during winter, and give a firm basis and compact feeding-ground for young roots. Recently worked soil, with its open air spaces, is not in the proper mechanical condition to receive the roots of a tree, and it is hard to bring it to the required firmness by ramming or tramping. The late December, too, has been an admirable time for studying plantations already made, for after the leaves have fallen it is easier to decide which trees should be removed or pruned. The weather has been unusually favorable for all pruning operations, whether undertaken to rejuvenate old trees or improve unsightly ones. It is yet in order to cover beds of Lilies or other plants which enjoy a protective mulch which does not exactly keep them warm, but insures a uniform temperature and guards against the alternate freezing and thawing which injures their cell-structure.

But even after all thought of work is over a stroll down the sunny paths of the garden of an afternoon has a charm of its own, although the bare twigs have lost their summer beauty. A few hardy plants still show fresh green foliage, and on many shrubs the berries hang, to give a flash of color here and there. The grass is yet green or a soft golden brown, and the trees with their grace of bare outline, the variety of tint and texture shown in their bark and the delicate tracery of their interlacing branches against the sky, are quite as attractive as at any other season. The twittering of a few lingering birds, the soft odor of the Firs and Pines, the mildness of the air, delude us into hoping that this second Indian summer may hold over into another year. But the most seductive of these days are often the precursors of wild storms, and one wakes after a moonlit evening of delight to find the ground white with snow, and a lowering sky bending over the frozen earth.

The old age of the year is treacherous. Chill and paralysis attend it, its days are brief, its nights are long. In storm and darkness it creeps to its end. However it may put on the semblance of life and warmth, death and icy cold are at hand, and the last leaves are dropping into its open grave. It is the period of retrospect, the time for getting rid of the cast-off garments of the past, and clothing ourselves afresh for the coming of the New Year. But if the last week of the old year be a reminder of disappointments, there yet lingers in it that hope which is freshly born with its lengthening days. Though the sap be chilled in the branches of the trees, it still stirs in the trunks and warms the roots, and prepares in silence the new growth. The old leaves help to protect and nourish the young shoots; from death issues life; and so the great unending cycle sweeps on, explaining to us that all is but change. End there is none, only rest and new birth, the burial of the seed and the resurrection of the plant, the sorrow of evening and the joy of the dawn, the passing of the old year and the happy birth of the new. This lesson of the garden and the forest is a lesson of comfort and cheer. It upbears the mind in failure, and encourages it to renewed effort and to patient waiting for results. The seed shall not fail to bear fruit, even if long hidden from view in the bosom of the earth, which buries but to nourish, and destroys but to bring new life.

In another column of this issue will be found an interesting account of the nursery of Mr. George W. Vanderbilt, near Biltmore, North Carolina, together with a sketch of the proposed forest and arboretum so far as their plans have been matured. This enterprise is wholly of a private character, and the account seems to have been prepared for a magazine of local circulation to meet the natural interest in the undertaking which has been manifested by Mr. Vanderbilt's neighbors. We reproduce it, however, because the matter is of more than local importance, and because this is the first authentic publication that has been made of the scope and purpose of the work. The establishment of a nursery containing such a variety of woody species is of itself an event of the first importance to all intelligent lovers of trees; and if the arboretum project is carried out upon the lines indicated, it will become an institution of world-wide usefulness. Of course the project now is only a promise, and the realization of its possibilities in full measure can only be attained after years of patient study and labor, of study and labor, too, organized and directed and controlled by the broadest knowledge and the most thorough training which the age can furnish. The conception, however, is a noble one, and it is encouraging to be assured that the foundations of the work have been laid with intelligence and care. The almost unparalleled richness of the southern Appalachian region in species of trees and shrubs, and the number of exotics which would thrive on the banks of the French Broad River, warrant the belief that a collection of unrivaled interest and value could be established there, while the grandeur and beauty of the natural scenery of western North Carolina must prove an inspiration to any artist of

creative genius who is entrusted with the landscape design.

As we have said, this is a private enterprise purely ; and yet the span of a human life is so short when compared with the possible life and the ever-growing influence of a well-ordered arboretum, that the project can hardly be conceived of in any other way than as a great institution, or, rather, in connection with the forest and other features of the plan, a cluster of institutions, devoted to special science and art. Indeed, it cannot fail to be a centre of educational influence in forestry, arboriculture and landscape-art, so long as it has any lusty life, whoever may direct it. Looking, therefore, at the enterprise in its essential relations to popular education in science and art, we may be allowed to express the hope that provision will be made to ensure its perpetuation. It is not often that men of wealth and public spirit find so worthy an object for their generous impulses.

Notes of a Summer Journey in Europe.—III.

BEFORE leaving Geneva for Pallanza, on the other side of the Alps, a short excursion was made to some of the villages along the northern shore of the lake, and opportunities were found for a ramble through some of the vineyards which cover every hill-side. To persons always accustomed to the prevailing American mode of pruning Grape-vines by leaving one or more long stems and training them to high trellises, the system practiced here at first seems strange. The old portions of the plants look like stumps, generally not more than a foot above ground. At the top of the stump are from two to four short arms, two or three inches in length, and from each of these arms one or two shoots are allowed to grow and bear from one to three bunches of grapes. At pruning-time these shoots are cut back to the stumps again. In some vineyards the stumps appeared old, and were entirely moss-covered, the moss sometimes being as much as an inch and a half thick. Some rather small stumps were said to be at least thirty years old. The vines are usually tied to slender stakes about four feet in height, the tying material being simply one or two stalks of Oat-straw or other Grass-plant, with the ends tied or made fast by a neat twist. So diminutive do these vines appear in comparison to those trained on our system, that from a distance or from a train they seem more like Peas or Tomato-stalks trained to stakes.

The vines are planted quite near together, and, apparently, hand-labor is entirely depended upon in the cultivation of these vineyards. Indeed, toward the upper end of the lake, anything but careful hand-labor would be impossible on account of the great steepness of the hill-sides, which are faced with stone walls supporting terrace upon terrace, so that the soil cannot be washed away. The situation is exceedingly favorable for Grape-culture ; every foot of land fit for it is made use of, and one is impressed with a sense of thrift and economy in such intense cultivation. At Nyon some rather weedy vineyards were noticed, and laborers were busily hoeing out such weeds as Mustard, Chickweed, a pretty flowering but pernicious Bindweed, or Convolvulus (*C. arvensis*), Potentillas with long runners, and Canada Thistles, the latter in full bloom.

The dreaded Phylloxera has apparently not yet gained a foothold here, and the vines generally seemed very healthy. They had not long ceased flowering, and the little grapes were mostly just well-formed (July 21st). Many of the bunches were infested by little lepidopterous larvæ, or caterpillars, one or more of which attack a bunch. They spin little silken tubes, within which they live separately, and generally accomplish the destruction of a considerable portion of the cluster of fruit.

After leaving the lake, and on proceeding toward Brieg, on the Simplon Road, Apple-trees and orchards become more common, and are usually found in land which is kept in grass. Our common Locust is thoroughly naturalized, and grows as rampantly as a weed all along the railway. Above Brieg, on the Simplon Road, the Walnut-trees were bearing no fruit, the young tips and blossoms having been destroyed by frost. The mountain-sides were still covered with flowers, most noticeable among them being several kinds of Campanulas. On descending toward the Italian frontier, the native Clematis (*C. Flammula*) becomes conspicuous everywhere, strongly suggesting our own Virgin's Bower. Farther down in the valleys the Walnut is again abundant. The young walnut fruit is here much destroyed by lepidopterous larvæ, which cause the immature nuts to drop during the summer, the injury being analagous to that caused by the codlin-moth among apples.

As soon as we cross to the Italian side of the Alps and get to the region about Lake Maggiore, we find the treatment of the Grape-vines to be very different from that practiced around the Lake of Geneva. Here the vines are allowed to grow long, as we are most accustomed to see them, and they are trained to tall poles or trellises, or very commonly to living trees. The tree most selected for this office is the common Field Maple (*Acer campestre*), a species which does not generally grow to a very large size. Most of the branches are removed, only enough being left to keep up the life of the tree. The removal of the branches allows the sun and air to have free access to the vine, while its living support has at least the advantage of not needing frequent renewal ; although, on the other hand, it must take considerable nutriment from the ground, which should otherwise be appropriated by the vine. The practice is one which will hardly commend itself to thrifty cultivators.

The main object of my excursion south of the Alps was to visit some of the gardens at Pallanza on Lake Maggiore, particularly the gardens and nurseries of the Messrs. Rovelli. The rows of thrifty specimens of our great Southern Evergreen Magnolia, planted here as a street and shade tree, at once indicate that Pallanza enjoys a climate peculiarly favorable for trees and other plants of warm, temperate regions. Handsome high hedges and immaculate clipped walls of what is called *Elæagnus pungens* showed how thoroughly acclimated is this Japanese species, which we have not yet been able to grow well where the temperature is liable to go a good many degrees below zero of Fahrenheit.

The nurseries of the Messrs. Rovelli are not kept as an exhibition or show-place, in the popular sense of the term ; but, although no studied attempt is made to produce landscape or floral effects, there is much to please and repay any one who may be able to spend a few hours there.

The greatest interest in the place rests in the fact that here we find large, characteristic, and often handsome specimens of a great number of rare trees, shrubs and other plants which the firm propagate ; so that the visitor who personally goes to this nursery with the intention of purchasing may obtain a fair idea of the size, effect and other characteristics which his plants may develop when they attain to a good age and large proportions. Conifers and other evergreens are most largely represented among the arborescent plants, and we find here such well-grown specimens of Pines and other trees as are rarely seen in the collections which the average traveler is likely to visit.

One of the rarities of the garden and an object of special pride is a handsome specimen of the so-called Chinese Golden Larch (*Pseudolarix Kæmpferi*), which is as much at home in this mild Italian climate as it is when subjected to the extremes of heat and cold, which it endures so well in the vicinity of Boston. This specimen produces fruit biennially, and the seed is allowed to fall and germinate beneath the tree, as greater success in procuring young plants is obtained in this way than by any artificial sowing which has been tried. The ground was covered with thousands of young seedlings, whose light-green foliage formed a complete and very pretty covering.

A specimen of the Monterey Cypress (*Cupressus macrocarpa*), at forty years of age, has a trunk three feet in diameter, and makes a handsome tree ; and, besides other large Cypresses, here also are good representatives of the Sequoias (*S. sempervirens* and *S. gigantea*), the first ninety feet high, while of the latter a curious pendulous form was pointed out as one of the novelties of the nursery.

A specimen of *Cryptomeria Japonica*, from fifty to sixty feet high, is the finest I saw anywhere. This has not yet proved hardy enough to thrive well at the Arnold Arboretum. A large specimen of the rare and beautiful Californian *Abies bracteata* thrives here, and produced fruit some years since. The very long, sharp-pointed leaves, which are white beneath, and the curious long-bracted or porcupine-like cones make this one of the most distinct and remarkable species of the genus. Another curious tree is *Keteleeria Fortunei*, long considered by many botanists as an Abies, and known as *A. Fortunei*. Its right to a distinct generic name now appears to be well established. This species is a native of south-eastern China, and is only hardy in warm temperate or sub-tropical regions. It may truly be called a very rare tree outside of its native habitat, the Messrs. Rovelli having the largest and finest in cultivation. This individual tree has a trunk two feet in diameter, covered with a curious corky bark resembling that of the Cork Oak. Although it produces cones in

abundance, it has not, owing to lack of pollen, produced perfect seed. It is propagated by grafting on stock of the common European Silver Fir (*Abies pectinata*), while a limited number of own-rooted plants are also produced by fastening rings of damp sphagnum to the branches in the same manner that many greenhouse-plants are rooted. Among other Firs were fine examples of Nordmann's and the Cilician Fir. The first is well known as being quite hardy at Boston, while the other is somewhat more tender. *Cunninghamia Sinensis*, *Podocarpus Chilina*, *Fitzroya Patagonica* and Araucarias (fruiting) were some of the other most interesting conifers noted, and which we are accustomed to see only as pigmy plants in greenhouses.

Reference to the Pines should not be omitted, for a number of fine examples are to be seen here. *Pinus Canariensis*, an insular species from Teneriffe, seems to be a favorite and does well, and a Himalayan species (*P. longifolia*) attracts attention by its curious long-leaved foliage. Among our American species we find here the Californian *P. insignis*, one of the most ornamental Pines in cultivation, but, of course, not hardy in our northern gardens, and the Long-leaved or Georgia Pine (*P. palustris*), which is not more enduring, although some of our nurserymen have led many amateurs into buying it. Of several Mexican Pines, one of the prettiest is *P. patula*, while another long-leaved one appears to be a form of *P. Montezumæ*.

Several species of Palms prove quite hardy in the open air. Among these the most interesting and remarkable is a specimen of the beautiful Coquito Palm (*Jubæa spectabilis*), of Chili, forty or forty-five years old, twenty feet in height, and with a trunk almost three feet in diameter. An example of *Cocos australis* was in flower, and the Japanese Fan Palm seemed quite at home. Quite a variety of Bamboos have been brought together, some of them being twenty or twenty-five feet high. One of the specialties of the establishment is the cultivation of Camellias, of which there are a great variety growing in the open air, while their near relatives, the Tea-plants, are to be seen growing beside them.

Much more is to be seen here than can be well indicated in these notes, and any one interested in the fruits of warm temperate regions will also find much to study. Twelve or fourteen varieties of the Japan Persimmon (*Diospyros Kaki*) are grown, and the fruit is said to be gaining in popular favor.

An old friend was noted in the herbaceous Asiatic Lespedeza, which, in a particularly warm spot, was expanding its very first flowers (July 23d). This pretty, rosy purple flowered, leguminous plant is apparently no more shrubby at Pallanza than it is in our northern gardens, where it blooms in the autumn. Unfortunately, it is most widely known as *Desmodium penduliflorum*, a name which should no longer be kept up, as by its botanical characters the plant is a true Lespedeza.

Arnold Arboretum. *J. G. Jack.*

George W. Vanderbilt's Nursery.

AN article under the above title appears in the December number of *The Lyceum*, a magazine published in Asheville, North Carolina. We have made allusion to it in our editorial columns, and herewith reproduce the greater portion of it. It was prepared at the request of the editor of *The Lyceum* by Mr. Frederick Law Olmsted, whose name is a guarantee that it is authoritative.

1. It is intended that the greater part of the estate with which the nursery is connected shall be occupied by a systematically managed forest, constituted mainly, at least, of such trees and bushes indigenous to the region as are likely to be of commercial value. This forest will be in a large part formed by the improvement, through thinning and otherwise, of the present young "second growth," but considerable spaces, now bare of trees, or the trees on which are unpromising, will be planted. The extent of the forest is to be fully 4,000 acres.

2. Roads will be carried through the forest, in the laying out of which the motive of convenient transportation from its different parts will be modified by regard for picturesque interest, and the immediate borders of a part of these roads are to be planted with the object of gradually forming more interesting foregrounds than might otherwise be presented to view from them.

3. It is proposed to make a plantation, three or four miles in length, along the borders of a certain series of the forest-roads which will contain a few specimens, suitably classified and arranged for study, of each of the native trees of the region, and of all other trees that can be obtained from any part of the world with a reasonable hope that they will flourish under the conditions of climate and soil of the locality. This will be "The Arboretum"; in effect an Experiment Station and Museum of living trees. It may be hoped to be of considerable national value, as the trees acquire their mature character, perhaps fifty years hence.

4. It is intended to gradually form in some of the glens of the estate, passages of local scenery resembling those naturally occurring in many similar situations in the mountain-regions of North Carolina, of which the more notable constituents are lustrous smooth-leafed evergreens, such as the Rhododendrons and Kalmias, Ilexes and the Leucothoe. In the glens there are occasional partly flooded or water-soaked areas, in or on the edges of which grow Cane, Bullrushes, Sagittarias and other aquatic forms of vegetation, mostly herbaceous. With masses of such evergreens as have been indicated above, it is designed to associate a comparatively small number of foreign bushes of a generally similar, glossy, evergreen character, by the introduction of which, if it can be successfully accomplished, greater variety and grace of form and vivacity of tint, and, at points, more complex intricacy of effect may be obtained than if the planting were to be confined strictly to natives. Also the attempt will be made to naturalize a few foreign plants, as, for instance, certain Bamboos, Nelumbiums and Nymphæas, each having qualities of its own, differing from, but to be pleasingly associated with, those of the native aquatic and water-side plants.

In the nursery there are now under propagation, or already in cultivation, young trees and bushes for each of the four above-stated purposes. Of such of these as are designed to be used either directly, or as stocks for propagation, for the Arboretum, there are two or more examples each of four thousand two hundred species and varieties. Of the different species of Rhododendron, Kalmia, Leucothoe, Andromeda, Ilex, Laurus, Osmanthus, Aucuba, Abelia and other smooth-leafed evergreens collected or otherwise obtained with a view to the fourth class of plantations above defined, there are now in the nursery, or planted on the banks of Ram branch, 20,000 plants, not including those intended as ground-covering, such as Ivies, Evergreen, Loniceras and Running Roses, Hypericum, Periwinkle, etc., of which the present stock is about 100,000. Among the Rhododendrons there are two examples each of four hundred hybrid varieties, mostly the result of crossing the Catawba Rhododendron, growing naturally on the high mountain-tops of North Carolina, with others largely obtained from the Alpine regions of Europe and from the Ural and Himalayan mountain of Asia.

All of the plantations described are intended, as they come to maturity, to have a natural aspect, and to stand in harmonious and modestly subordinate relations with the general landscape of this region of country. There will be a small space of "kept grounds," near the dwelling of the proprietor, which, for the most part, will be laid out formally, with a view to domestic convenience and correspondence with the buildings, consequently, with a clearly defined demarcation from the natural landscape. There will be but little space given on the estate to what are commonly called "ornamentals," and none to the exhibition of mere curiosities, eccentricities or rarities of vegetation. There is, consequently, little in the nursery of special interest from a gardening point of view. Its stock of trees and bushes of merchantable size now numbers about 100,000; of seedlings and cuttings propagated on the grounds during the last year, about 500,000. Some of the stock having been brought long distances (part from southern Europe, part from Japan) and delayed on the passage, is not at present looking very thrifty, but after the next winter's rest is expected to fully recover.

The entire undertaking looks to results that can be fully realized only after many years, and, except to a botanist, its value lies in its promises and experiments rather than its actualities.

New or Little-known Plants.

Spiræa discolor, var. ariæfolia.

THE panicle of flowers of *Spiræa discolor*, var. *ariæfolia*, figured on page 617, is from a photograph of a specimen grown during the past summer in the Arnold Arboretum, where it bloomed better than it has ever done before, no doubt owing to the comparative mildness of the past two winters and to a moderate amount of winter protection given to it. Perhaps, also, it is one of those plants which are apparently hardier after they attain a considerable age. Although one of the most beautiful of all the Spiræas, it

unfortunately is not, or, at least, has not proved sufficiently hardy so far to always withstand our New England winters without some shelter or protection. On this account it is rarely seen here as it cannot be planted with any assurance of giving satisfaction. It is not impossible that hardier strains may yet be procured from higher altitudes or colder latitudes. Its native habitat is mainly west of the Rocky Mountains, where it is said to range from southern California northward through Oregon and Washington and into British Columbia at least as far north as the forty-ninth degree of latitude.

This variety was originally described as a separate species under the name of *Spiræa ariæfolia*, and as such it is still commonly known in catalogues and collections. Later botanists have relegated it to the rank of a variety of *S. discolor*, an apparently extremely variable species, as there is at least one other distinct botanical variety (var. *dumosa*) recognized, which, being less northerly in its distribution, is not so hardy as the form under consideration.

Under cultivation and favorable circumstances this Spiræa becomes a large shrub ten or twelve feet high and as much as fifteen feet in diameter. The branches are slender and covered by a very minute pubescence. The bark is at first light gray in color, but after the second year it is dark brownish gray. When young it is marked by minute longitudinal ridges, which become obsolete with age. The foliage is usually so abundant that the stems are well covered.

As the name denotes, and the figure shows, the leaves have the outline and pinnatifid lobing which gives them some resemblance to the leaves of certain forms of the European Beam-tree (*Pyrus Aria*), but this character is common to the other variations. They vary from one to two or three inches in length, and are usually quite densely covered on the under surface with a close grayish pubescence.

In this latitude the blossoms usually begin to open in the last days of June or early July, and flowering is continued for about three weeks.

The individual blossoms are small and of a pale greenish white color, so that the whole panicle has a rather dull white effect. The large loose feathery, much-branched panicles are produced at the ends of the shoots, and are frequently very much larger than shown in the figure. They are borne in as great profusion as the panicles on a well-grown *Hydrangea paniculata*, and, in a manner, are almost as effective, though lacking their pure white lustre.

The odor of the flowers has been described as that of Sweet Birch, but it is as strongly suggestive of honey, with perhaps a faint hint of Chestnut-blossoms which renders them not entirely agreeable to many people.

Seed is freely produced, but it is not easily separable or distinguishable from the chaff or remains of the withered flowers, which are so persistent that they still adhere when the leaves have fallen. Plants may either be reproduced from seed, or more speedily by layers, or from cuttings of green wood started in sand under glass. They do not spread much from underground shoots. It was early introduced into European gardens, and was brought to England in 1827. Wherever it is hardy it is deservedly much esteemed; and it is particularly valuable because it blossoms at a later season than the vast majority of shrubs.

Although we have spoken of it as a Spiræa, it should be noted here that the late C. J. Maximowicz, in his monograph of the Spiræas, places *S. discolor* under a separate genus, the generic name proposed being Holodiscus, which was first used as a subsection of Spiræa. He removed it entirely from that genus, as he considered that it was related to the Potentillas, and that it was also allied to the Raspberries by its two pendulous ovules.

Maximowicz did not recognize the varieties of *S. discolor* as they are designated in botanical works, and, besides these, he also included one or two other plants which had been described as species and whose range extends through Mexico and as far south as Guatemala.

With the present tendencies toward creating and more sharply defining genera, it is not at all unlikely that the classification of Maximowicz will come to be universally accepted, and that our plant may finally be known as *Holodiscus discolor*, or, if there proves to be sufficient difference to warrant keeping up the varietal name, as *H. discolor, ariæfolia.* Indeed, the name Holodiscus is already in use in some botanical gardens, and is taken up in Coulter's "Manual of the Botany of the Rocky Mountain Region."

Arnold Arboretum. *J. G. Jack.*

New Orchids.

Aërides Lawrencæ, var. Amesiana, Sander.—A robust and handsome variety, with short, rigid dark green leaves, and the purple tips of the sepals and petals broader than usual. It is said to be like a dark-colored form of the variety Sanderiana in the flower, but to differ in habit. It was introduced by Messrs. F. Sander & Co., of St. Albans.—*Kränzlin, in Gardeners' Chronicle*, October 3d, p. 393.

Cypripedium Godefroyæ, var. luteum, O'Brien.—A very pretty variety, with the ground color of a clear soft primrose-yellow, and the spotting pale rosy lilac. It appeared in a batch of the ordinary form in the collection of Messrs. Hugh Low & Co., of Clapton.—*Gardeners' Chronicle*, October 3d, p. 393.

Cypripedium × Enfieldense, Hort.—A handsome hybrid, raised in the collection of A. J. Hollington, Esq., Forty Hill, Enfield, by Mr. Ayling, from *C. Lawrenceanum*, crossed with the pollen of *C. Hookeræ*. It is like an improved *C.* × *marmorophyllum*, in which *C.* × *barbatum* takes the place of *C. Lawrenceanum*. The leaves are much like those of the two parents. The dorsal sepal is very broadly ovate and subacute, stained and nerved with purple on a light green ground, paler toward the margin. The petals are deflexed and much like those of *C. Hookeræ* in their bright purple color, but not quite so broad near the apex. The lip and staminode are intermediate in character.—*Gardeners' Chronicle*, November 7th, p. 546.

Phajus maculato-grandifolius.—This is a handsome hybrid, raised by Mr. Seden for Messrs. James Veitch & Sons, of Chelsea, from *P. grandifolius*, crossed with the pollen of *P. maculatus*. It has the general habit of the mother plant, but the leaves are rather thinner than those of that species, and have a few yellow spots as in the pollen parent. The spike is nearly three feet high, with the flowers about as large as those of *P. grandifolius*. The sepals and petals are yellow, with a slight coppery tinge, and the lip yellow at the base, with its infolded front lobe chestnut-red, and some lines of the same color extending to the base of the lip. It was awarded a first-class certificate by the Royal Horticultural Society on November 10th last.—*Gardeners' Chronicle*, November 14th, p. 591.

Kew. *R. A. Rolfe.*

Foreign Correspondence.

London Letter.

Bulbous Plants.—Among the species of Crinum cultivated at Kew there are several which usually flower in winter. The following are in bloom now, and will continue so until the end of the month: *C. angustum.* This is one of the handsomest of the large evergreen tropical species. It forms a specimen as large almost as the *C. Asiaticum*, figured early this year in Garden and Forest, the thickness and length of the stem-like neck of the bulb and the width and length of the fleshy bright green foliage being very similar to what I described in that species. In the flowers, however, *C. angustum* is much more attractive, each flower being fully six inches across. The segments are narrow and recurved, and they are colored rich deep crimson, paler on the inside. There are as many as thirty flowers in a single head, and they open in slow succession. The species is a native of Mauritius and the Seychelles, whence it was introduced to Kew seventy years ago. I do

not see any difference between this and *C. amabile*, which is also now in flower at Kew. They are alike in all characters, and on turning to Mr. Baker's description of these two species in his "Amaryllideæ" I perceive that both descriptions are essentially the same. There is, however, the difference in geographical position, that called *C. amabile* being a native of Sumatra. *C. Hildebrandti* is another species in flower twice already this year. It is a pretty pot-plant, and not too large for the ordinary shelf in the stove. It was sent from Johanna Island, off the south-east coast of Africa, in 1875, to Berlin, by the collector Hildebrandt, and a few years later to Kew by Sir John Kirk. Although found at an altitude of 3,000 feet, it suffers from cold if kept in an ordinary greenhouse. *C. bracteatum* is

Fig. 98.—Spiræa discolor, var ariæfolia.—See page 615.

evergreen species, and one which is very easily kept in health in a stove. It has a neck a foot long, is almost leek-shaped in fact, with strap-shaped leaves eighteen inches by two inches. The flowers are borne in an erect head on a scape a foot high, and are remarkable for the length of the tube, which is from six to eight inches long, and perfectly straight. The segments are three inches long, narrow, spreading and recurved; pure white. We have had this similar in general characters to *C. pedunculatum*, but does not grow to so large a size. It has a short thick neck, broad fleshy leaves, and a flattened scape a foot long, bearing numerous pure white flowers two inches across. The stamens are reddish. Originally from the Seychelles, but now well known in cultivation in the tropics. *C. pedunculatum* is quite as large as the common *C. Asiaticum*, the only difference between the two being in the size of the

flowers and in the number of ovules. They are both noble stove-plants and very easily grown. They may be planted in borders in warm houses, but grow equally well in pots. They like an abundance of water at all seasons. *C. giganteum* has recently been figured in Garden and Forest, so that I need only mention it here among those which are in flower now. It blooms twice or three times annually.

Callipsyche is a small genus of Amaryllids which is represented in gardens by two species—namely, *C. aurantiaca*, a native of Ecuador, at an altitude of 8,000 feet, and *C. mirabilis*, from the Andes of Peru. The former is now in flower in a stove at Kew. Although not possessed of much attraction in the shape or color of the flowers, yet the plant is decidedly interesting, and well worth a place in a collection of stove-bulbs on account of the peculiar form of the flowers. The bulbs and leaves are similar to those of Urceolina, while the scape is erect, fistulose, two feet high, and bears an umbel of a dozen yellow flowers, which spread horizontally, and are tubular, two inches long, with the stamens protruding three inches beyond the recurved tips of the segments of the corolla. The flowers remain fresh on the plant about a month. The treatment for this plant should be the same as for *Urceolina pendula*.

Eucharis grandiflora (*Amazonica*) is, of course, in flower now. We find that by treating this plant as if it were a tropical Daffodil, or, in other words, giving it plenty of water at all times, a rich loamy soil, not too much sunshine and not too frequent disturbance at the root, never, in fact, so long as it is doing well, it will flower twice or thrice annually, keep free from the mite (Rhizoglyphus) and behave itself exactly as a good stove-plant should. Many cultivators fail with this and the several other species of Eucharis through subjecting them to a process of alternate high-feeding and starving, which may answer for some bulbs, such as Hippeastrums, some Crinums and Nerines, but which is quite opposed to the nature of Eucharis.

Nerines.—Except *N. flexuosa* and *N. Munselli* these are now all over, and the plants are in full-leaf growth. Our chief difficulty with these beautiful bulbous plants is owing to the absence of sunlight in winter, when they are in full growth. In America the Nerines ought to become general favorites, your bright sunshine, even in the depth of winter, being favorable to their growth. In Ireland, especially in the Glasnevin Botanic Gardens, in the Scilly Isles, in Baden Baden, and even so near London as Windsor, Nerines are a success, but they do not grow satisfactorily in any garden which is within reach of London fogs. Given a fair amount of sunlight in winter, and Nerines will prove most valuable greenhouse-bulbs. They grow from November to May, rest from then to October, and then push up their gorgeous and elegant flowers.

Bomareas.—These are not bulbous, but they are Amaryllids, and they are in bloom now. I propose to send shortly a series of notes on this genus for publication in Garden and Forest. In the mean time I may call attention to three of the best of them, which Professor Sargent saw in flower and admired at Kew this week. They are *B. Carderi*, *B. Caldasiana* and *B. frondea*. The first of this trio has scandent stems from eight to twelve feet long, clothed with broad leaves and terminal umbels of flowers as large as those of Lapageria and of similar texture. Their color is rich rose with conspicuous spots of brown on the upper part of the segments, the inner segments being greenish white. I have seen an umbel of flowers on this species which measured two feet in diameter and contained over fifty flowers. *B. frondea* has stems eight feet high, lanceolate, dark green leaves five inches long, and terminal umbels of rich golden yellow flowers, with a few spots of brown. The head formed by the flowers is suggestive of the umbel of *Alstrœmeria aurantiaca*. *B. Caldasiana* has broader leaves than the last-named and looser umbels of flowers, which are shorter than in *B. frondea* and colored a deeper yellow, with larger spots of brown on the upper half of the segments. This species and *B. Carderi* have not been out of flower since June. They are planted in a shallow bed at the south end of a sunny greenhouse, their stems being trained against the roof, from which the flowers hang gracefully.

Lachenalias are pushing up their flower-spikes and promise to make a fine show presently. The perpetual flowering *Cyrtanthus Mackeni* is as attractive now as it was in June. Its near ally, *C. lutescens*, ceased flowering about a month ago.

The first of the Hippeastrums to bloom is the sturdy and really useful *H. aulicum*, the variety known as *superbum* being better than the type. I like this plant because of its evergreen nature and its vigorous free-flowering habit, characters which unfortunately do not belong to many of the species or varieties of Hippeastrum.

London. *W. Watson.*

Cultural Department.

Strawberry Notes from Wisconsin.

Among the more progressive market-growers, the Warfield is the most popular variety at the present time. It was given the first place at the last meeting of our state horticultural society, and in our trial grounds at the experiment station it proved decidedly more productive than any other variety tested. Its rich glossy color and its firmness, coupled with remarkable productiveness, are its specially valuable qualities. We have several varieties, however, that yield fruit of better size and quality. The appearance of the berry is sufficiently like that of the Wilson to permit the two varieties to be packed in the same case without detection unless by the expert, a fact which makes the latter sort popular as a fertilizer for the Warfield.

The Haverland was second in productiveness on our grounds. In color, this berry is decidedly inferior to the Warfield, though it averages a trifle larger. In quality there is little difference.

Lady Rusk has proved disappointing. It is fairly productive, but the fruit is irregular in shape, inferior in size, and poor in quality. In firmness it does not surpass the Wilson or Warfield.

Shuster's Gem was only fairly productive, and the quality is inferior. Edgar Queen was productive and promising. General Putnam has value as a family variety, the berry being large and of good quality, but its color and softness do not commend it for market.

Our finest early variety was the Van Deman, which gave its first ripe fruits three days before any other. A peculiarity of this sort, if we may judge it from the past year's record, is that it ripens the bulk of its crop very early, several days before any other variety tested. This, with its other good qualities, will probably give it a place as a market variety. It is of fine color, firm enough for a near market, fairly productive, and of good average size and quality. Though ripening first, its crop held out through the entire strawberry season. This, together with the fact that its flowers are perfect, should give it especial value as a family variety.

Our finest late sort was the Eureka, which proved much more productive than the Gandy, while equal to it in all other respects. The Jessie succeeds admirably with some growers, while it is disappointing with others. At its best it is a remarkable variety, the plants being very productive of fruit of the largest size and superior quality. On our own grounds it has done only fairly well. The old Wilson still holds its own with a few market growers, notably J. M. Smith, of Green Bay. Where vigor has been maintained in the plants, and high cultivation is given, it must be confessed that this old stand-by has few superiors.

Perhaps it should be added that the comparative earliness or lateness of different sorts may depend considerably upon the weather during the strawberry harvest. If the weather is dry at the commencement of the strawberry season maturity in the earlier sorts will be hastened. If abundant rains fall after a few pickings have been made, the later sorts may take on a new growth, which will delay their maturity considerably. This was well illustrated on our own grounds the past season. Dry weather prevailed until the majority of our varieties had commenced ripening, when abundant rains followed, and the maturity of the later sorts was considerably postponed. Owing to this the strawberry season was considerably prolonged, berries having been gathered for the table during an entire month.

University of Wisconsin. *E. S. Goff.*

The Hellebores.

THESE plants are the best of their season, and they are not much inferior to the choicest afforded by the garden at any time of the year. Helleborus is a genus of perfectly hardy, herbaceous perennials, with or without stems, varying in height from six to twenty-four inches, with deciduous or persistent palmate or pedate leaves, and inhabiting Europe and Asia. The common names, Christmas and Lenten Roses, are given on account of the season when the flowers of the two sections appear; but, of course, they are not Roses, but members of the Buttercup family. The popular name, Christmas Rose, Christmas Herb, or Christ's Herb, originated with the Dutch, Rose having probably been substituted for Herb from the resemblance of the flowers to those of a wild Rose.

According to the "Genera Plantarum" of Hooker and Bentham, there are ten or twelve species. Mr. J. G. Baker, however, in the monograph of the genus which appears in the *Gardeners' Chronicle* for 1877, recognizes only six species, and classes other forms as variations of two of these distinct types, or species closely allied to them.

H. lividus is a pretty Corsican species, with flowers of a bright greenish color, known in gardens since 1710. A variety, Integrilobus, differs slightly from the type in the foliage. Both flower in spring. *H. fœtidus* is a large species with decorative, persistent foliage, producing large panicles of greenish flowers, margined with dull purple, during the early months of the year.

The Black Hellebore (*H. niger*) is the best of all the species, and a first-rate garden-plant. This is the true Christmas Rose, a very variable plant common to central and southern Europe, and first introduced into England by Gerard in 1596. The typical form is from six inches to a foot high, the pedate, coriaceous leaves on stout petioles, which proceed from a spreading underground stem, as do the erect scapes, which, during the autumn and winter months, bear from one to three cup-shaped, pinkish white flowers about three inches in diameter. The variety Altifolius, or Maximus, is the largest and most handsome, the pure white flowers, suffused with pink externally, from four to five inches across, and at their best in November and early December. *H. niger angustifolius* is an extremely floriferous sort, a trifle smaller than the type, flowering in October and November, and of pure white color. This variety is the best for forcing and pot-culture generally. Madame Fourcade is an excellent pure white form of *H. niger*, blooming in November and December. In the variety Major the blossoms are like those of Altifolius, but somewhat smaller, and developed in December and January. Riverston's variety has large pure white flowers, which are borne in great abundance during November and December. Only a few days ago I picked a large cluster of flowers from a plant of this variety in a Massachusetts garden. The leaves were a trifle ragged, but the large pure white flowers were in excellent condition. The blooms of the variety Rubrus are of a charming pale reddish tint, large, and expand in January. This is a free-flowering variety, very distinct and useful, being the only Christmas Rose with red flowers. *H. niger vernalis* (*Caucasicus*) is another handsome kind which blooms in January, the flowers being large, pure white, tinged with rose externally, and delightfully fragrant. Several other varietal names are given to alleged forms of *H. niger*, but the characters of the plants thus distinguished, excepting one known as Variegatus, which has leaves of green and white, coincide so markedly with those of the kinds already mentioned that it is sheer folly to perpetuate them.

H. viridis has ornamental foliage, and is sometimes grown on that account. The flowers are bright green, from two to three inches in diameter, and produced in spring. It is a native of Western Europe, and is said to have escaped from cultivation in some parts of our eastern states. The following are ranked as sub-species of *H. viridis: H. Bocconi*, a form from the mountains of Etruria, in cultivation ten or fifteen years, flowers green and agreeably odorous. *H. cyclophyllus*, a green-flowered, Grecian plant, unknown in gardens; *H. graveolens*, a Hungarian form, with greenish flowers, tinged with purple; *H. intermedius*, a native of Austria, flowers green and purple; *H. luxus*, also from Austria, with pale green flowers; *H. purpurescens*, the last and by far the best of the group, which, with *H. Bocconi*, are the only forms really deserving general attention. The former bears large, deep, purplish flowers of large size, and has been admired in gardens for seventy years; *H. orientalis* is a Grecian species, introduced about 1839. It is about eighteen inches high, and produces white flowers, with purple margins in late spring. A comparatively large number of sub-species are built on this plant as the type. Among these are *H. abchasicus*, with greenish purple flowers, and cultivated in European gardens for a quarter of a century; *H. Antiquorum*, a beautiful form, with pale purple flowers; *H. atrorubens*, a very desirable kind, with large flowers of deep purple color; *H. Caucasicus*, with pale green flowers, and wholly distinct from the *H. Caucasicus* (*vernalis*) of the niger group; *H. Colchicus* is from Asia Minor, and one of the best of the entire genus, with large and abundant rich purple flowers; *H. guttatus*, an attractive plant from the Caucasus, having flowers pure white, spotted with purple; *H. odorus*, a native of Austria, bearing numerous green and fragrant flowers; *H. Olympicus*, bearing in winter white flowers tinged with green, and *H. pallidus*, a similar plant.

The Orientalis group contains, in addition to the above, numerous varieties, and some plants which are presumably hybrids of the Viridis and Orientalis sections. The finest of these are, Apotheker Bogren, large, rich reddish purple; Frau Irene Heinmann, bright purple, with reddish spots; Gertrude Jekyll, very fine pure white; Leichtlini, white, spotted crimson, and Punctatissimus, pale purple, freely marked with spots of a much darker shade. It is evident that *H. niger* and *H. orientalis* yield nearly all the plants of the genus which are of value in gardens. These, at any rate, will be found satisfactory to ordinary growers, and the others can be added for investigation and experiment. The student and hybridizer will find in the Hellebores a wide field for interesting work, and all who cultivate plants for their beauty alone will be agreeably surprised with the results of any extra attention given to them.

Cambridge, Mass. *M. Barker.*

The Cranesbills.

THESE plants have always been of peculiar interest to me, the rarer forms always possessing great charms; few hardy perennials combine more handsome foliage, with showy flowers borne in profusion, or are more easily grown. They are in no sense weedy, and do well in almost any soil and in all exposures. They must not be confounded with the tender Geraniums, which properly belong to the genus Pelargonium.

Geranium sanguineum is one of the oldest cultivated species; its dark red flowers are borne continuously through the summer and into late autumn, and show to advantage against the dark green, handsomely cut foliage. The variety Lancastrænsis has light pink flowers veined with deeper color. *G. Endressii* has light green, nicely cut foliage and clear pink flowers, but unfortunately it is a little tender here. The double form of *G. pratense*—one of the oldest of old-fashioned flowers—is really a showy plant, and gives an abundance of bloom up to the late summer months. The flowers are very double and deep purple in color.

G. peltatum is especially noteworthy in its foliage, for, though the flowers are freely borne, they are of secondary consideration. *G. Ibericum* is very choice, with deeply cut and fringed foliage and showy open panicles of deep violet flowers, an inch or more across and veined with purple. It makes a bush one and one-half to two feet high, producing an abundance of flowers throughout July and August, and the variety Platypetalum is richer in the color of its flowers than the type, and the whole plant is not quite as large in growth. With us it is a freer bloomer. Some time since I imported a plant as *G. Londesii*, and it has proved the best in my collection, forming a large, self-supporting broad bush, three feet high, and heavily enveloped in late July with open, flat panicles of light blue flowers, fully an inch and a quarter in diameter and handsomely veined with purplish violet. It is very distinct from any other species that I have, both in foliage, flower and habit. I have doubts, however, as to the correctness of its name.

G. Wallichiana is of prostrate, trailing habit, with light green, palmate foliage and deep red flowers, borne sparingly all summer. It is a desirable plant, used as a trailer, and its Himalayan habit lends peculiar interest to it.

Reading, Mass. *J. Woodward Manning.*

Fertilizers for Tomatoes.

YOUR remarks on Fertilizers for Tomatoes interest me. I have become satisfied that the difficulty with Tomatoes in this latitude, where they are, as a rule, very unsatisfactory in midsummer, is very largely due to the general impression that heavy manuring is not good for them, especially the heavy use of stable-manure. A large part of the benefit of well-rotted stable-manure in a hot climate comes from the abundant carbonaceous matter mixed with it, which tends to keep the soil from baking hard in the summer heat, and pre-

serves moisture. I have been particularly struck with the success of an old negro, a porter in a mercantile house in Raleigh, in growing Tomatoes and keeping them up all through the summer. So I sought him out and asked about his method of cultivation. "Well, boss," said he, "I'se jess got a bit of a gyarden to 'muse myself moonlight nights. I keeps a pig and some chickens, and saves their manure, and my boy scrapes up the hoss droppin's on the road, and we gits rich dirt and mixes it all up in a compose pile ready for spring. Den, in April, when I sets out my Termatter-plants, I digs a big hole for every one of 'em and fills it mos' full ob dat compose. De holes is ober a foot deep. On de top I puts some of de sile, and sets de plant right in de middle, wid a stout stake alongside ob it, and ties de vine up to it; and it jess grows and grows, and keeps a-growin', an' I cuts off de side shoots as soon as I see de blossom on 'em. Dat's all, boss. Dem plants jess keep a-growing', and I cuts out de old straggly stuff now an' then, and has fresh shoots an' Termatters all de time." There is a lecture on Tomato culture! Such heavy manuring may not do everywhere, but in this climate of alternate deluges and droughts the old colored man's plan works well, and will be tried in my own work next season. I am not sure, however, that it is advisable here to train the plants off the ground. Close training to one main stem exposes this stem too much to the sun and makes it short-lived. I am inclined to believe that better success will be had here from vines sprawling on the ground, and shading with their foliage not only the stem of the plant but the ground as well. I have abandoned varietal tests of Tomatoes, and will, hereafter, study modes of culture and development.

Raleigh, N. C. *W. F. Massey.*

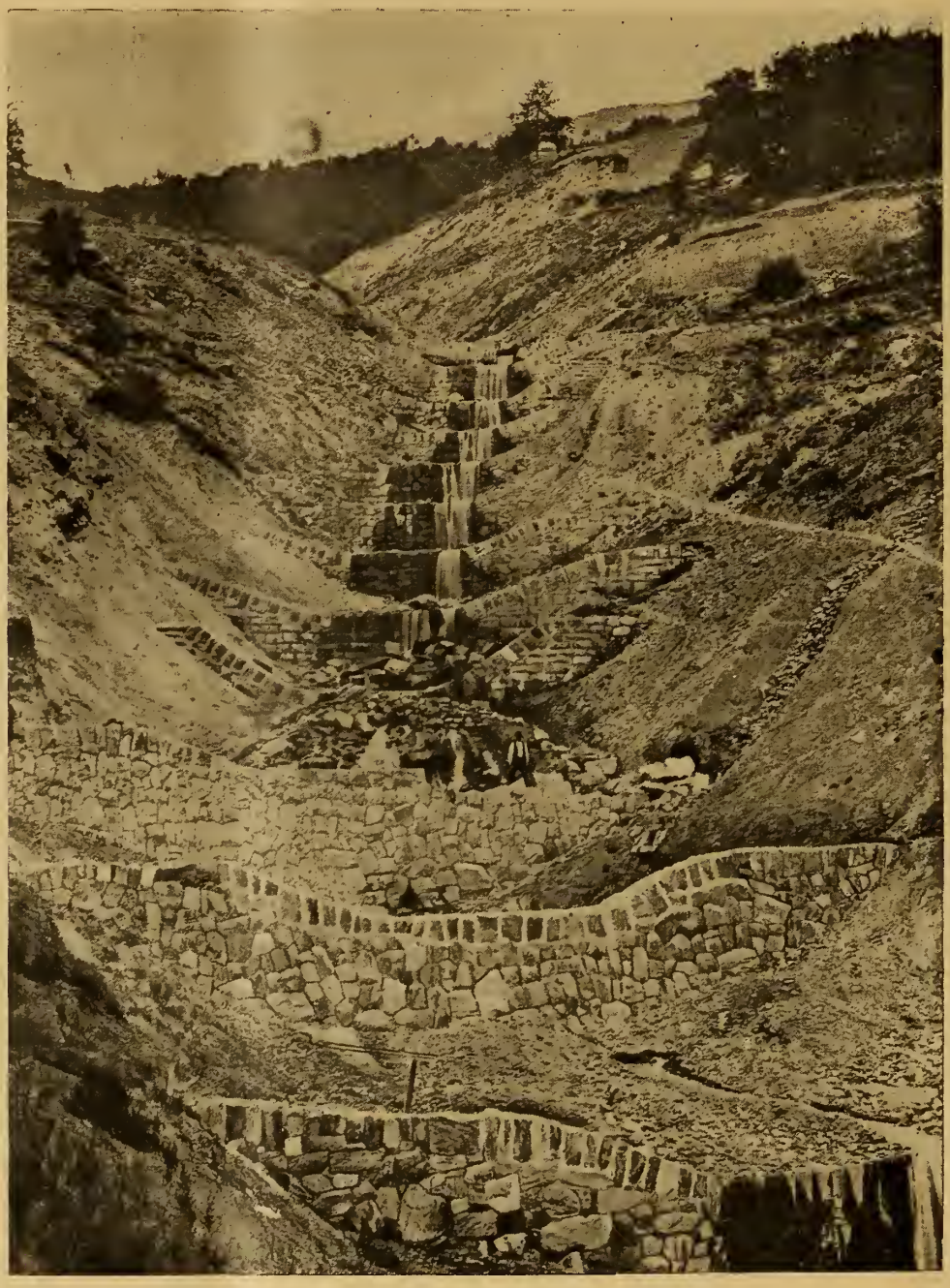

Fig. 99.—Corrective Works in one branch of the Torrent of Grollaz.—See page 621.

Dwarf Callas.—About two years ago there appeared in the *Gardeners' Chronicle* a cut of a new dwarf Calla, which created considerable interest among gardeners and florists, inasmuch as it was doubted whether its dwarfed character could be perpetuated. That it is a genuine novelty has been fully proved by a local florist, who imported a number of bulblets last spring. The bulblets were very small, scarcely averaging the size of a pea. About ninety per cent. of the importation lived, and some have now reached the blooming stage. There is every probability of its becoming an important winter-blooming pot-plant. In a six-inch pan it makes an elegant specimen, and it would prove of great value for the decoration of the dinner-table. The plants I saw were single crowns with twelve fully developed leaves, one open spathe, and two others in the process of development, and the whole plant was not more than ten inches high from the soil. The spathes had six to

eight inches of clear stem, the expanded portion measuring two and a half to three inches across, thus making one of the neatest flowers possible for boutonnières.

Any one who knows how to grow the common Calla need have no trouble growing this. A light soil, with abundance of well-decayed manure, is preferable, with enough drainage to allow water to flow off quickly. The best plants I saw were growing on a bench near the glass, in a temperature of fifty-five to sixty degrees, and with a light shading even in December. Others were growing in a cooler house, quite exposed, in a drier atmosphere, but did not appear to thrive so well, and were dwarfer, or stunted. The bulblets as they appear about the crowns may be taken off as soon as they develop one or two leaves, and as they need no ripening they will grow at once into neat plants. I believe good marketable plants with one spathe could be grown in five-inch pots.

Violas.—I lately picked, from under a slight covering of Pine-needles, a bouquet of these in yellow and blue. Unprotected, they would have been all withered by frost; but why are they not oftener seen in gardens? They are hardier than Pansies, and will almost take care of themselves. But they become ragged with age, and so it is better to transplant a few of the seedlings, which can always be found about an old bed. They bloom all summer long, and nothing is neater for shallow dishes.

Wellesley, Mass. *T. D. H.*

The Forest.

The Subjection of Torrents by Reforestation of Mountains.—IV.

THE TORRENT OF RIOU-BOURDOUX.

THIS torrent, classed among the incurable ones, and famous for its devastations, was the most powerful of all those which raged in the French Alps. Starting from mountain crests at an altitude of 2,900 meters, it rushed into the Ubaye 1,800 meters lower, after a course of three and a half miles with an average pitch of 30 to 100. Its catch-basin is rimmed with ridges of tertiary rock, and at an altitude of 2,400 meters it enters the black Jurassic clays. Thus the Riou-Bourdoux, while yet near its source, rushes through deeply cut banks. It receives numerous affluents, most of which are justly entitled to be ranked as torrents already formidable. All these affluents flow between banks cut nearly perpendicularly to a depth sometimes of 100 meters, absolutely bare, bluish black in color and sinister in aspect. Fifteen years ago the Riou-Bourdoux was in full activity, steadily cutting under the foot of its banks and starting land-slides over enormous areas on both shores, which tended to join each other from opposite sides, but were quickly separated by the torrent, which, hollowing out its bed between them, carried into the valley prodigious quantities of material.

The mouth of its "channel of erosion" is found some 1,500 meters above the Ubaye, where the torrent spreads out over an immense cone of débris, the base of which is crossed by the national road from Montpellier to Coni. The area of the cone, nearly 600 acres, presents a most desolate aspect, without a trace of vegetation. With each great storm the wash flows over the cone, spreading now over one side, and again over the other. The national road is only a trail across the débris, ceaselessly covered with débris, so that large sums are annually absorbed merely to keep it in passable condition. Such was the situation in 1875, at the time when the works of restoration were declared necessary for the public good.

To-day the torrent is tamed, and, thanks to operations carried out along a definite line and with persistent energy, we are masters of the entire upper basin, where over 3,000 acres of restored forests occupy the degraded lands. The affluents are corrected, the bed is rectified in the channel of erosion, and after next year the subdued torrent will flow like a peaceful brook through a definite bed prepared on its cone, leaving an area of 593 acres to be restored to agricultural use.

In this instance especially was the suppression of the torrent a public benefit. It meant the rescue from certain ruin of the territory of an entire commune; the assured existence of a vigorous population on the frontier; the protection of a rich valley against deposits which are a destruction to arable lands, security to the threatened city of Barcelonette, and an open highway over the only road to France, an important point in connection with national defense in a notable part of the Alpine frontier.

THE COMBE OF PÉGUÈRE.

The ravine opens out at an altitude of over 2,000 meters on the east side of the mountain which overlooks the health resort of Cauterets. Long ago subdued by the vegetation which protected its catch-basin entirely, this gorge had again assumed activity, which increased as its basin was more and more denuded by the habitual passing of flocks of goats and sheep.

In 1884 the danger became more serious; the security of the thermal springs of Rallière and others was threatened, travel over the international road from France to Spain became dangerous, and the safety of Cauterets seemed threatened.

The alarm among the people in the valley was great, and their authorized representatives hastened to lay their grievances before the Minister of Agriculture.

The peak of Péguère, composed of granitic rock, presented this peculiarity, common in all the neighboring mountains of the same group, that on the crests the rock is broken in all directions, sometimes to very great depths. The walls of the ravine furnish a striking example of this; they are formed of blocks of all dimensions, with sharp outlines produced by the dislocation of the primitive rock, and with deep crevices between them. They are surrounded by sandy earth and placed in a most threatening state of instability. The least disturbance, the action of gravity alone, may start a movement among these rocks, but water especially brings on the great disasters. In winter, it filters in abundance into innumerable fissures, congeals there, and splits the rock in every direction. In spring, with a sudden melting of snow or with heavy rains the sands which fill the spaces between the blocks are washed away by the waters, and, equilibrium once broken, the movement begins. The blocks thus started leap down the smooth steep slope, dashing themselves to pieces, and sometimes bombarding the establishment of Rallière or that of Mauhourat with their fragments. Such a destructive force tends to increase more and more, and would soon threaten the town of Cauterets if measures prompt and energetic enough to subdue it were not taken.

This state of affairs is shown in the report of the survey made in 1884 by the foresters called upon to undertake the work of suppression. It was stated in the first report that in dry times the sands flowed into the hollows of the valley like sand in an hour-glass; the wind lifted it in clouds; in times of rain it was borne away by the waters. There was no rest in this ravine; incessantly some pebble starting dislodged larger blocks, which, like avalanches, descended with a terrible crash, shivering the rocks which they struck, and tearing the earth and trees as they bounded along.

The most intrepid mountaineers would only venture to cross the mouth of the Combe on a run, while into its depths they never thought of penetrating, so constant was the peril from falling rocks, which the slightest touch might dislodge.

Of course no work could be done here during the bathing season, the operations were restricted to the first days of spring or the last days of autumn. The construction of a system of walls on such a steep slope was not practicable, on account of the expense which their great number and size would involve.

The problem consisted essentially in retarding the motion of the more or less earthy sands, which keep the blocks in unstable equilibrium. Observation of the local climate, together with the nature of the soil, furnished a very simple and economical plan of solution. The plan was: (1) To clear the slopes of all loose blocks whose fall seemed imminent; (2) To reclothe, as far as possible, all the sands with a mantle of vegetation formed by plats of grass, and to calk, so to speak, all the spaces between the rocks considered reasonably firm; (3) To construct retaining walls of dry rock wherever the accumulated rocks left no chance for the grass to support itself.

This operation would leave no work of man visible except the retaining walls; the remainder would be transformed into a mountain sod, from which would emerge here and there portions of the protected rocks.

The execution of the work was exceptionally difficult; the necessity of working in the Combe only at rare times in order to avoid all danger to the thousands of bathers at the springs below; the total absence of roads and paths in the steep slopes; the lack of workmen accustomed to the perils which were to be constantly faced; the distance which it was necessary to transport sods; the danger from dropping the smallest stone in building the walls, lest it start an avalanche of rock; the lack of all shelter for the workmen; the difficulty of procuring water; constant dangers to the lives of the workmen—all these were discouraging conditions. But the workmen, following the example of their chiefs little by little, grew courageous and confident, and finally conquered all opposition.

The result of the first five campaigns exceeds the most san-

guine hopes, and the Combe has been subdued without damage or accident.

CONCLUSION.

The problem offered by the laws of 1860 and 1882 is now solved. Facts have abundantly proved that the solution is neither long nor costly, and that it is only necessary to aid nature by a series of small measures judiciously conceived and carried on with system and persistence.

The 579 square miles of forests recently created in the three regions, whether by the state or by communities and individuals, insure quiet for the future, and demonstrate by their vigorous growth how empty were the allegations of the politicians, who in 1860 ridiculed the possibility of reforestation. The task, indeed, is hard and thankless. It is on the most desolate mountain-heights, or in the depths of gorges, which they alone penetrate, that the foresters do their work quietly, often in face of public indifference, or even the hostility of selfish interests.

I can recall no nobler mission than theirs. Surrell was right when he said: "I dare to predict that the usefulness and the grandeur of this work will one day be recognized, and that it will have a place of honor among the great enterprises which will signalize this epoch throughout all coming time."

[A series of heliographs were shown at the Paris Exposition which vividly illustrated the magnitude and difficulty of the work of the French foresters in their campaigns against the torrents. Copies of many of these pictures have been exhibited at some of the meetings of the American Forestry Association, and some of them are now to be seen in the National Museum at Washington. Mr. Fernow, Chief of the Bureau of Forestry, has had plates made of some of them, and it is to be hoped that they will be published in a future Government report. On page 620 we give an illustration of a series of corrective works on the torrent of Grollaz, which will explain itself. The denudation of the mountains here was comparatively recent, and the Grollaz has only been a dangerous torrent in late years. In 1880 it had become a constant menace to the wagon-road between France and Italy and to the Mont Cenis Railroad, and at one time it seemed certain that the railroad would have to be moved to the other side of the arc, to which the Grollaz is tributary. But the steep-banked, narrow gulch, through which vast quantities of mud and stones were carried after every rain, is now a broad open bed. Its steepness is all taken up by the falls of the dams, and it carries no waste into the valley below. When the banks are covered with forest, the torrent will be definitely extinct. Of course, only a small portion of the engineering work can be seen in this picture, but the result of it all is, that not only are the road and the railroad safe, but canals for irrigation have been dug from the different levels made by the dams, and the Grollaz is now enriching the very fields from which it had once driven their owners.

We are indebted for the picture from which our illustration is made to Mr. Gifford Pinchot.—Ed.]

Correspondence.

In the Shore Towns of Massachusetts.—IV.

To the Editor of Garden and Forest:

Sir,—Marshfield formerly had a common. In earliest times it was the Training-field. The town ran a public road through it, and a religious society has a perpetual lease of a part of it as the site of its chapel. During recent years various persons have obtained permission to build horse-sheds on the remnants of the common, and there is not much of it left for future appropriation. Mr. Seth J. Ventress, who was born in this town, learned to lay brick and stone as they should be laid in structures that are to abide and endure, and he came to know more than anybody else about bakers' ovens and how to build them. He had $40,000 when he came to die a few years ago, and left $10,000 in trust to build Ventress Memorial Hall here, within three-fourths of a mile of the meeting-house, for a town-hall and public library. Daniel Webster's grave is in this town, and it is visited by thousands of the summer people. His birthplace, in the town of Franklin, New Hampshire, is not marked in any way.

Kingston has no park or common, or rights on the shore. Duxbury has a town-landing, perhaps two of them, not used. The Standish monument is here. It stands on the slope of a hill, because the top, the right place for it, could not be bought for this purpose. The Monument Association owns a small area around its base. It should be considerably extended and improved, and made a convenient and attractive place of resort for great numbers of people. This region is full of interesting local history and historic places.

Plymouth keeps its old Training-green, or some of it, a scant acre now. There is a tract of perhaps five acres around the great statue of Faith, and a small area about the celebrated Rock, down by the water-side. Coles Hill, where a few of the first burials were made, is a small, steep hill-slope just above the Rock, and is used as a park or place for seats for those who wish to contemplate the Rock and enjoy the view of the water. Burial Hill, five or six acres, is practically a park, and has many visitors. There are few interments now.

The great possession of Plymouth is Morton Park, 150 acres of unsurpassable woods, lying along the shores of Billington Sea. It has been described in your pages in more graceful prose than my pen can write. Mr. Morton seems to know every tree and every inequality of surface in the park. The city ought in time to own the shore lands entirely around Billington Sea. Plymouth is a very large town. It is eighteen miles across it, from the Kingston line to that of Sandwich. This great region is mostly woods, and is well watered. People say that a man can camp by a different lake every day in the year in this town, but I did not have time to camp by all the lakes or to count them. It is an enchanting region for summer residence, and people are finding it out in increasing numbers. There will be thousands of summer dwellers on these beautiful lakes in a few years. Every acre outside Morton Park is a private holding. Intelligent men here say that the permanent reservation of a strip of woods on each side of the public roads would greatly improve them. As much of the land is valued at twenty-five cents an acre for taxation, it would probably not be difficult to make a public holding of a belt a few rods wide on each side of all the principal public roads. This would give to great reaches of country much of the aspect and character of a park.

The method of keeping the public records of the town has been brought to a wonderful degree of accuracy and convenience. To the student of civilization these records are among the chief attractions of the place. The Pilgrim Society has an interesting collection of furniture, implements and other articles used by the early inhabitants. It is a valuable instrument for awakening and fostering interest in local history, and influences working to this end are much needed in the shore towns.

Sandwich has no town holding of any kind for a place of public resort. The Sandwich Glass Company had a small common near the glassworks, with large trees and seats for the operatives. It was a pleasant and valuable resting-place for them, but the company has gone out of business and the common is uncared for. There is a piece of remarkably interesting scenery near the road from Sandwich to Mashpee. It is a vast wooded hollow, or deep valley, which happens to have just the right proportions to be impressive. It ought to be defended from forest-fires, and its sylvan beauty perpetuated. There is no place of public resort in Bourne, and the boys of this town say they have no right to meet anywhere out-of-doors for athletic exercises, amusement or mutual improvement. Playing ball along the public highway causes complaint and is dangerous to persons passing, and if the boys assemble in a field or pasture they are warned away as trespassers. The boys think there should be a Town Field, or public playground, and some of the leading citizens take the same view of the matter. Intelligent men here feel much interest in the law relative to preserving ornamental and shade trees on the highways of the state. It is Chapter 196 of the Acts of 1890. The people here say their roads would be much better if the trees along the road-sides were left standing; that the highways are often injured, and all their beauty is destroyed by widening them unnecessarily; and that when they are straightened, and the old curving lines are abandoned, the scenic interest and value of the region is impaired, and the drives are rendered unattractive. Half-way between Buzzard's Bay Station and Bourne are the remains of an old trading-post, which was established here in 1627. The old cellar-pit and its walls are still, to a great extent, unchanged, but the land has been sold recently, and is likely to be improved, and this interesting monument of early commercial activity will probably soon be destroyed.

There has been considerable successful tree-planting in Barnstable. I walked about a piece of woodland which was planted

by its present owner, and which has long yielded valuable annual crops of timber for fuel and other purposes. It begins to look really forest-like. The Pitch Pine (*Pinus rigida*) is the tree which has been chiefly planted in this region. There are no considerable public holdings for places of resort in Barnstable. Old citizens say the town formerly held several hundred acres of town or common land, but that these tracts were seized by various persons who lived on them till they gained title by occupancy.

Yarmouth had, in earliest times, a little reserve, or common field of clay for making brick for the people. It was much used long ago, but not in recent years. A few years ago the town voted to fill it in and fence it, and it is now a pretty bit of common, with trees and grass, perhaps an acre in extent. There was formerly a town-landing on Bass River, but it was sold a few years ago. In early days Yarmouth granted portions of her common lands to various persons who were to retain these holdings as long as they "improved," that is, used them. These titles were not intended to be transferable to other citizens, but to revert to the town if the first holders should leave the lands. But the persons to whom the grants were made sold their rights, or claims, to others, who transferred them in turn, and the town's title was ignored. The town appointed a committee of lawyers and others to inquire into the matter. They reported that it did not appear to be worth while for the town to undertake to assert title to these lands. Bass River, between Yarmouth and Dennis, yielded $600 to each town, last year, from the sale of the right to the herring fishery.

Dennis is a beautiful town, full of quiet, satisfying scenery. There is a Cedar-swamp here, with unusually large timber. The "Old Whaling Ground" on the shore is an interesting town-holding. The editor of the *Register*, in Yarmouth, who has a remarkable knowledge of the local history of the region, told me that the Old Whaling Ground belongs jointly to the towns of Dennis and Yarmouth, as it was a common, or town, possession when the two towns were one. There is a very old Indian burying-ground on the shore of Scargo Lake, in Dennis, about an acre in extent. The town fenced it last year. The title is in the two towns, Dennis and Yarmouth. The Indians buried here were of the Nobscusset tribe. There is no park or common in Dennis belonging to the town. An acre or more around Liberty Hall, owned by an association, is called the Park. It is not, at present, much used or cared for.

There is a pretty little circular green near the church in Brewster, which belongs to the parish, and is, possibly, a fragment of the ancient Training-field. There is a town-landing on Cape Cod Bay, perhaps 200 feet of shore-line, at the end of a street. The town owns a herring or alewife brook, and appoints an alewife committee at the annual town meeting to catch the fish and dispose of them. Formerly the fish were abundant, and the town would often have 300 barrels of alewives a year. A family of eight persons would then have a right to a barrel of fish, and could buy more at thirty or forty cents a barrel. The committee now sells the fish to anybody who wants them. The gross catch is small of late years, not worth more than $100 usually. The population is decreasing, but it is likely soon to receive considerable annual reinforcements of summer inhabitants.

There is a green of perhaps an acre and a half in front of Pine Grove Seminary, in Harwich, the gift of Mr. Sidney Brooks, principal, and former owner. The town owns Herring River, from Long Pond to the ocean, about six miles, and has recently sold the fishing right for five years for $615 a year. Three citizens bought it to enable them to control the water for the benefit of their Cranberry-fields. Some of the people wish the town to sell the public fishing right once for all, finally and entirely—that is, to relinquish and extinguish this particular holding. There are many fine trees along the streets in the villages of this town.

Chatham appears to be the most easterly point in the state. There is no common or park. The town probably has a right in the long beach, but it has not asserted it lately. The marsh-hay was formerly sold by the town every year. There is a very old cemetery; the title is in the town. It has not been very well cared for. Some valuable materials for local history have been lost by the deaths of several old inhabitants within a few years. Champlain was here in 1606, I believe, and had some rough experience. He broke his rudder, probably on Pollock Rip, and found it difficult to make a landing. The Indians helped him, but afterward he had a fight with them, and two of his men were killed. He called the place Port Fortune, and set up a cross on the shore. Some of the people here know the place, approximately at least, and it would be well to mark it in some way The shore region here is interesting and attractive, and the summer people are crowding in. The depth of the water along this part of the coast is constantly changing, and the wariest navigators meet surprises. One of the great chart-makers of the world lives here, and his fame is known in all littoral countries.

Boston, Mass. *J. B. Harrison.*

An Indian Orchard.

To the Editor of Garden and Forest:

Sir,—When the whites settled in Oneida County, in the centre of New York state, they found there an Apple-orchard owned by the Tuscaroras. It was long known as the "Old Indian Orchard." The trees were set without the least consideration of order, and they numbered several hundred. The sorts were varied, and did not correspond to the cultivated fruits, but were evidently seedlings from those in cultivation. We have now at least one of these, known as the "Indian Rareripe," grafted about the state. It is a large, excellent, handsome, early-autumn Apple. It was the best mid-early fruit we had before the advent of Porter and Gravenstein and Strawberry. Whether other sorts from this source are still propagated I cannot say.

The Tuscaroras reported that the orchard was on their land when they came from the south to join the Iroquois League. This is possible, but not probable. It was certainly planted somewhere near 1715 or 1720, when they reached their northern home. They had come into close contact with the whites in Carolina and Virginia; and it is most likely that they obtained the seeds of them and brought them north and planted as soon as they reached here. At any rate, the Indian orchard and the arrival of the Tuscaroras are two events that closely coincide. Had the orchard been planted by the Indians already here, it is unaccountable that they did not have more such plantations. But the Kirkland orchard, of which I own the remnant, planted in 1791, was the only other plantation of Apple-trees in central New York in the last century.

Were the Indians in any sense horticulturists? We have been compelled lately to give over our early classification of them as strictly hunters and fishers. They were fond of agriculture. The Mohicans and Iroquois, as well as the southern tribes of Cherokees and Choctaws, were accustomed to raise large fields of Potatoes, Maize, Tobacco, Pumpkins and Squash. Those who lived far enough southward cultivated Cotton, which they wove for clothing. It was an article of traffic, as well as Tobacco and Corn. Not having suitable tools, they adopted the plan of burning over a tract of land and using it for a garden. This was sufficient preparation for Corn, vines and Tobacco, but would have been valueless for the European grains.

The fruits repeatedly spoken of by the early visitors and colonists are Strawberries, Mulberries, Raspberries; but all these are mentioned invariably as growing wild. This is not to be wondered at, when we remember that our own people did not to any extent cultivate the Strawberry and Raspberry until toward the middle of the present century. Fifty years ago we relied for these and for Grapes almost wholly on wild vines. In Brown's "Genesis of the United States" will be found letter after letter going over the fruits with which the Indians regaled their visitors, or enumerating those found on the river-banks and in the villages. Invariably all fruits are spoken of as wild. This admirable work carries us into direct contact with original documents. Bancroft, in his "Native Tribes of the Pacific Coast," makes it clear that the western Indians also were entirely deficient in the arts of horticulture. Fruits of the Rose family were always wild. So we come very certainly to the conclusion that our Indian orchard came from seed procured from the whites, and was not the result of artificial improvements, or of selection of a natural sort fostered and taken advantage of by the aborigines. Such other orchards as were found in the west were of a date not anterior to 1700, and were the result of proximity to white people. The Wild Apple of America has not been the parent of any of our choice fruits; but we can invariably trace all our choice stock back to a parentage from Europe. The earliest imported seed was of Pippin, Pearmain, Bellefleur, Gillfleur and Swaar, and the blood of this early parentage can be traced in all the best fruits we now cultivate. The Spy, Wagener, Jonathan, Spitzenberg, Fameuse, Rhode Island Greening, Newtown Pippin are children or grandchildren of the well-known imported roots. Most of our early orchards were from imported seeds.

It seems clear that we have not given the Indians sufficient credit as land-tillers, but yet we cannot compliment them with any truth as horticulturists. Still, the fact that the Indians pre-

ceded the whites with their own rude arts of fruit-growing is interesting. The first orchard planted by the Six Nations, probably by the Sixth Nation, or Tuscaroras, anticipated the work of missionary Kirkland by about seventy-five years. The chief matter of lament is that we have not more minute records of the trees, the apples and the uses made of them. But we have at least one sort, and it should be kept as a historic landmark. If others have data either to corroborate or add to controvert my opinion, I shall be glad to know it. I believe no tree of the original Indian orchard remains. I hope to sustain in life one or more of the trees planted by Kirkland until the close of this century. That will make them one hundred and nine or ten years old.

Those who know the abundance of rich berries in all wild sections will not wonder that the Indians never saw any advantage in growing them in gardens. The Plum was their best large fruit, and was enormously abundant on all the river-banks and forest-edges.

Clinton, N. Y. *E. P. Powell.*

Notes.

Dandelions are blooming to-day on many of the lawns in this city and its suburbs.

In his *Plantes Potagères*, M. Vilmorin figures sixty-six varieties of wheat with clearly distinguishable charcteristics; but in the Agricultural Museum at Poppelsdorf, in Germany, no less than six hundred varieties are exhibited.

Mr. A. H. Church, in his "Food-grains of India," says that the millets constitute a more important crop in India than either rice or wheat and are grown more extensively, being raised from Madras, in the south, to Rajputana, in the north, occupying, in all, about 30,000,000 acres.

California during the year just closing has produced a more valuable crop of fruits and vegetables than in any previous one. Some of the statistics of shipments are 30,000,000 pounds of oranges and 78,000,000 pounds of other green fruits, 72,000,000 pounds of dried fruits, 47,000,000 pounds of raisins and 78,000,000 pounds of canned goods.

Fruit-culture, which is now a very important industry in Bohemia, is said to have been first practiced there on a very large scale at the beginning of the present century by French immigrants who had been driven from their homes by the Revolution. The results of their industry and their love of natural beauty are also to be traced in many of the parks which adorn Bohemian towns.

Colonel Pearson has expressed a fear, in an article prepared for this paper, that the copper mixtures used as fungicides may have a deleterious influence on the soil. Mr. Frank T. Shutt, chemist of the Dominion Experimental Farm, writes to the *Canadian Horticulturist* that the copper which reaches the ground from properly conducted spraying is so minute in quantity and insoluble in nature that no fear need be entertained that it will poison vegetation.

At a recent exhibition of the Royal Horticultural Society Baron Schrœder showed a two-flowered plant of the beautiful *Cypripedium insigne*, var. *Sanderæ*, which was unanimously awarded a first-class certificate. It differs from all other varieties of *C. insigne* (of which we have about twenty named) in having flowers of a uniform shining, soft yellow color, without spots anywhere, while the upper part of the dorsal sepal is pure white. We may look upon this as the nearest approach to an albino Cypripedium yet discovered.

One of the most famous and fatal poisons used in Japan, according to the *Inland Printer*, is obtained from the Bamboo. The young shoots of the cane, when they first push through the ground, are covered with fine, brownish hairs, which, under the microscope, appear to be bayonet-like spikes of crystals of silex, infinitely sharp and hollow. Small quantities of these hairs, administered daily in the food, bring on ulceration of the whole alimentary canal, simulating malignant dysentery, which eventually causes death.

In a paper prepared for the American Pomological Society, Professor Massey says that throughout all the coast region and the lower part of the Oak belt of North Carolina, the Fig produces good crops with literally no cultivation. Some attempts are now being made to raise figs for commercial purposes. In Halifax County one grower last year marketed his crop, from five acres of Figs, in a fresh state in strawberry-boxes, and realized a very profitable return. With modern facilities for canning and evaporating, there is no reason why Fig-culture cannot be made profitable in all the coast region of North Carolina.

The San Francisco correspondent of the New York *Tribune* recently wrote: "Allen Kelly, who has just returned from an inspection of the forests of the Sierra Nevada, declares that the only way for the Government to save the timber-lands from destruction is to withhold all mountain timber-lands now unsold and make a series of reservations from Shasta to the new Sequoia Park. All the high Sierras about the Yosemite must be reserved soon or the timber will be ruined. As it is, the timber is becoming so thin on these high plateaus about the Yosemite that the snow melts rapidly, and most of the water-falls in the famous valley are dry by midsummer."

As an illustration of the general law under which nature seems to avoid hybridizing, Professor Bailey cites the instance of the great genus Carex or Sedge, which occurs in great numbers and many species in almost every locality in New England, and in which the species are particularly adapted to intercrossing by the character of their inflorescence. Even between species of this genus but few undoubted hybrids occur. Among 167 species and prominent varieties inhabiting the north-eastern states, there are only nine hybrids recorded, and all of them are rare or local, some of them having been collected but once. Species of remarkable similarity may grow side by side for years, even intertangled in the same clump, and yet produce no hybrid.

Writing of Haidarabad, the capital of the Nizam's dominions in the Dekhan, in southern India, Bishop Hurst says, in his recently published "Indika": "The garden of the Nizam is public. . . . I never tired of wandering through its labyrinths enjoying its delightful fragrance, and examining the endless variety of its plants. Every art which these cultivators of flowers in India have arrived at by the experience of centuries is here employed, by rich designs in colors, by succession of flowering shrubs, and by a happy combination of large shrubs and the smaller plants. All the more delicate plants are in pots, and need to be watered every day. There are six millions of potted plants alone, to say nothing of the multitude of larger ones."

According to the *Pittsburgh Dispatch*, Mr. Arras, an engineer in the Government service, states "that the beginning of the end has come, so far as the White Oak in Pennsylvania is concerned. The Government lately gave a contract in this city for some square White Oak timber, of a size that a dozen years ago could have been found in the hard-lumber yards hereabout in an hour's time. After a persistent search the contractor threw up his contract, stating that he could not fill it. It was then given to another and, at the end of a fortnight, he reported that he had secured all but two pieces, and that they were not to be had. Mr. Arras then got the order modified, and, as changed, it was filled, after all the log-rafts lying in the river had been inspected."

To a correspondent who inquires which are the best varieties of the Carnation to use as house-plants, we would say that there are no varieties which can be classed among good window-plants. The Carnation is nearly hardy, and it loves pure air and a cool temperature too well to be a successful window-plant in the ordinary sense of the term. A temperature no higher than fifty-five degrees is best suited to it at night, and this is cooler than most living-rooms in American houses. The atmosphere is too dry for the healthy development of many plants, and as the Carnation especially rebels against such surroundings, other plants had better be selected. Of course, where there is a sunny window in a cool, well-aired room, some Chrysanthemums will do fairly well.

Dr. E. Lewis Sturtevant sends some interesting extracts from a translation from an Arabic treatise on agriculture and horticulture, which was published in the twelfth century in Seville. From these extracts it appears that in Moorish Spain as early as the twelfth century, of cucurbitous plants alone there were cultivated Cucumbers, Melons, Water Melons, Gourds and Benincasa for food, and the Colocynth was grown for medical purposes. The Pumpkin had not yet appeared. They show also that many varieties of each of these plants were in ordinary use, and these varieties are carefully described. In the cultural direction it is said that if the seeds of the Melon and Cucumber are soaked in honey the fruit will be of a sweet and pure savor; if in vinegar, in a certain way they become acid. If Cucumber-seed is soaked in fresh milk the fruit will become sweet. It may be added that this opinion is found also in Latin authors.

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