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DEPARTMENT OF HORTICULTURE AND ENTOMOLOGY.

NOTES ON CONIFERS

FOR KANSAS PLANTERS.

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DEPARTMENT OF HORTICULTURE AND ENTOMOLOGY.

E. A. POPENOE, A.M., PROFESSOR OF HORTICULTURE AND ENTOMOLOGY.

S. C. MASON, B.Sc., ASSISTANT IN HORTICULTURE.

F. A. MARLATT, B.Sc., ASSISTANT IN ENTOMOLOGY.

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NOTES ON CONIFERS FOR KANSAS PLANTERS.

There is probably no greater lack of information in any line of horticultural interest in our State, among people not skilled planters, than in that which concerns the distinctions between the species of conifers, and the methods of handling these trees. No questions are oftener met in our correspondence than those asking how and what to plant in the line of these favorite ornamentals. The grounds of the State Agricultural College have been for the last twenty years the scene of much experimental planting, and there are few places in the State where the conifers are growing in greater variety than here. With the assurance that the information conveyed will be acceptable and useful to many, we present this account of the more common conifers, and our experience with them.

SUGGESTIONS TO PLANTERS.

In handling evergreens the requirements are those of successful handling of trees of any kind, with due regard to two points of difference. The foliage of most conifers being persistent, there is always to be regarded the greater danger with these trees of their drying out on exposure to the air when the roots have been separated from their vital connection with the soil, whatever the season. They are further unlike many deciduous trees, in that their roots once dry are hardly to be revived. They must be protected, then, by some close packing material, kept well dampened while in transit, though but for a few rods only; and success is more certain if the tops of the trees also are covered or shaded while the roots are out of the ground, as well as after the tree is set, if the season be dry and the sun warm. We have suffered more loss in moving trees of this class *after* the shoots have begun to push in the spring, than at any other season. The shoots are at first like elongated buds, and inexperienced planters are less likely to notice this unfavorable stage of growth than if the trees were deciduous, and were expanding their buds on the naked wood into leafy branches. As a rule we prefer to move evergreens, as indeed we do all trees, in the spring, just *before* the buds open and the shoots push. At this period the conditions are most favorable, because the tree is exposed for the shortest possible time to injury by loss of moisture from the leaves, as it is now pushing new roots and the spring rains may be expected at this time to assist its revival. Success has usually followed our trials of winter planting, where proper

precautions have been taken to preserve a large ball of frozen earth about the roots, and to avoid the bruising of the branches of the tree, an injury from which they do not easily recover. Protection to the branch is best afforded by drawing them carefully toward the tree, and wrapping and cording to place the whole lower part, exposed to danger in handling, in burlaps, old carpets, or similar material. So guarded, the tree may be loaded by tackle upon a sled or stone-boat, and moved with the minimum of danger. In this method of planting it is of course essential that, on resetting, the crevices about the frozen ball of earth be compactly filled, lest on thawing, the earth fall away from the roots and expose them to dry air.

AS TO PRUNING.

It is by no means true, as some think, that the conifers in general are not susceptible to improvement in form by the proper use of the pruning-knife. Most people know that the red cedar, the juniper, and the arborvitae may be pruned without danger, yet few seem willing to risk placing their spruces and pines under the same treatment. If the work be done with judgment and with regard for the more definite growth of the latter, they are quite as readily pruned as other trees. We have often found it necessary in the spring to reduce the foliage of lately transplanted trees in order to offset the imperfect connection of their roots with the soil, and prevent their drying out before this condition could be made good. We have accomplished this object to the manifest advantage of the tree by the simple process of shortening-in the new growth while the shoots were yet tender and brittle, having due regard at the same time to the improvement of the form of the tree where possible. It is easy in this manner to go over large trees, cutting off the terminal half of the shoot where it is desired to lessen growth in that direction, or to thicken the foliage at that point, and leaving intact those shoots that it is desired to encourage in length. The improvement is not visible until the year following the pruning, because it comes through the pushing of several lateral buds that have been forced into growth by the removal of the terminal bud of that branch. It is not best, as a rule, to cut back the leader or shoot at the tip of the central trunk, in this manner, as with many trees the loss of this leading bud will result in dividing the central growth into several branches. In most of the spire-shaped trees, however, this injury is likely to be overcome by the supremacy of one of these branches over the others, and so a new leader is provided. But with the lateral branches this division of the apical growth into several branches is often a great improvement, and we have seen trees almost worthless by reason of their open, ragged growth, re-formed by several years of such pruning, into quite acceptable specimens.

WHAT TO PLANT.

This question requires answer, of course, according to the demands of the special case, and the statement of experience with many species as given be-

low may furnish the hint required. For the preliminary planting in a new locality or in a new soil it will be advisable to select only those kinds that are hardiest as tried elsewhere. These once established, the chances for the success of others are increased.

The favorite conifer with the Kansas planter is still

THE RED CEDAR,

Juniperus Virginiana, native to the river bluffs from the middle of the State, southward and eastward. It is selected not specially on account of its beauty, though many trees are less handsome in spring and summer than a thrifty young red cedar, but because of its general hardiness throughout the State wherever conifers will at all survive. The species is too familiar to require description, but it should be stated here that it is deserving of more care in handling than is sometimes its fortune to receive. This tree is, like other evergreens, susceptible to injury when it is exposed to dry air with its roots lifted from the soil, and most of the failures to transplant it are due to a neglect of the general principles noted in the foregoing pages.

Next to the native red cedar, the conifers most certain to succeed in this locality are the Scotch and the Austrian pine; and when we come to choose the hardiest and on all accounts the best tree, we find it difficult to decide between these. As they are practically equally hardy, the choice may, perhaps, be made on the ground of form and special fitness for the situation to be planted, and their differences in this regard are sufficiently conspicuous.

THE AUSTRIAN PINE,

Pinus Austriaca, is of compact growth, its form in younger specimens a cone with broad base, the perfect tree sometimes nearly as broad at the ground-line as the trunk is high. Some nurserymen designate two varieties of this pine by the names "black" and "common," but we have never been able to find the difference necessary to establish these varieties, nor are they so distinguished in the text-books, so far as we can learn. The leaves, two in a sheath, are semi-cylindric, slightly channeled within, with rough edges, and are commonly somewhat flexuous or twisted. They are dark green, in average length nearly six inches, and persist on the growth of several years back. The cones ripen at the end of the second season's growth, and those of the present are found on the branches with those of last summer's origin; the former, at the ends of the present year's shoots, are now beautiful little oval purple bodies nearly one-half an inch long, while the latter, still green in color, nearly full-sized, two to three and one-half inches long, in pairs or threes, stand horizontally out at the point marking the beginning of the present season's growth. Not infrequently the empty cones of two seasons' age yet persist, but these are usually shed before the ripening of their successors. The tree is of formal habit, the branches are equal and well distributed, and an ill-shaped tree is exceptional. They are soon thinned in growth if too much shaded, and need room for perfect development. They

handle safely in all sizes if taken at the right time. Most of the larger trees on the College grounds at present were moved in winter from the upper farm, a mile and a half away, with a ball of frozen earth about their roots, and were, at the time of moving, from five to ten feet high, with corresponding spread. Careless handling in a few cases resulted in bruised limbs below, these remaining imperfect; but most of the trees began and continued growth the spring following as though they had not been transplanted. At the time of the building of the greenhouses, seven years since, a single tree, twelve feet high, of fine shape and condition, was standing upon the proposed building site. With the wish to save this tree it was removed several rods, with as large a ball of earth as would hang about the roots, to a new site. Although it was in July, and the season was no more favorable than usual, the tree suffered not the slightest apparent injury, and is now a perfect specimen twenty feet high.

The most important losses in transplanting trees of this species have occurred to us in moving small trees in the dry, hot, windy fortnight that is a regular feature of our spring weather preceding the opening rain-storms, and coming at the time when the buds are ready to push. But this season is most unfavorable for transplanting all the evergreens, as it exposes their foliage to a great loss of moisture while the roots are disconnected with the soil; conditions bringing uncertainty with even the hardiest trees.

The chief objection to the Austrian pine is that it is too heavy and formal for most small grounds, its foliage in the winter assuming a hue the darkest of any evergreen excepting the red cedar. In respect, if in any, it is that

THE SCOTCH PINE,

Pinus sylvestris, finds its recommendation over the other. This tree is of a more open and spreading growth, the foliage-covered branches are much less heavy and thick, while the leaves are more twisted and of a lighter green: a combination of features that produces a markedly different aspect. The Scotch pine is of very rapid growth, the terminal shoots on young trees often extending the trunk each year by two feet, and this extent accordingly marks the distance between the whorls of branches along the trunk. The shoots are relatively slender, and are less densely clothed with leaves than in the Austrian pine. The leaves are two in each sheath, two or three inches long, slender, twisted, in form a flattened semi-cylinder, the flat face distinctly hollowed, and, under the lens, are many-lined, with a decided glaucous that gives a pleasing lightness in appearance to the tree in growth. As in the Austrian pine, the cones require the growth of two seasons to mature, and there are at any time two years' cones on the tree, those of this and those of last season's growth, occasionally accompanied by the empty cones of the preceding. These empty cones, however, do not long remain attached after they have shed their seed. The full-grown cones, occurring either singly or in pairs, are nearly two inches in length, rather narrowly conical in form, of relatively few, blunt-pointed scales, and bent down or

backward along the branch. This pine seems to handle with as little loss as the Austrian.

THE TABLE-MOUNTAIN PINE,

Pinus pungens, is a third species that in point of hardiness leaves little to be desired. The trees of this pine, however, are much less available in planting than those of the two preceding, on account of a rather too picturesque irregularity in form, and are scarcely desirable in limited grounds. They handle well, and we have not known them to suffer injury by reason of any climatic extreme. The leaves of this pine are two, occasionally three, in a sheath, light or yellowish green, thick, rigid, semi-cylindric, rough-edged, twisted, and three or four inches long, the tips with acute, rigid points. The sheaths on the new growth are half an inch in length, light brown; on the old, one-eighth inch in length, dull dark gray in color. The foliage of the new growth is often interrupted at two places on the shoot by bare spaces one to three inches long, probably marking the situation of the staminate catkins that have fallen off earlier. The cones, which occur in whorls of three or four, are two years in reaching maturity; the younger are oval, spiny, light greenish-yellow in color. Those of a season's growth are bright green, the spiny scale-tips brown. When full grown they are as long or a little longer than the leaves, rounded conical, each of the numerous thick scales tipped with a long, stout, sharp, curved spine. The bark of the trunk and larger branches is dull grayish brown, seamed with red-brown in the fissures where the newer layers show through.

This tree shows a strong tendency to an irregular growth, the terminal shoot often bending quite out of the vertical, with the result of a grotesquely leaning tree, the character of which is still more marked by the separation of the main branches into as many individual masses of foliage. These striking characteristics, made more prominent in the association of this with other evergreens by its decided yellowish-green foliage, fits the tree admirably for breaking the monotony likely to result in large grounds from the too free use of the more regularly formed, dark-green species.

THE DWARF MOUNTAIN PINE,

Pinus montana, said by Veitch to include *Pinus Mugho* and *Pinus pumilio*, names often occurring in nursery catalogues, varies considerably in habit and stature. The most desirable specimens form broad, low, dense masses of evergreen foliage, spreading, as measured in examples on our grounds, ten feet with a height of five in trees not less than sixteen years of age. Others are more upright and less compact, a measured specimen being twelve feet high by nine feet broad. The trunk is divided at the ground into several ascending rather smooth branches with dark bark. The leaves, in pairs, are two to three inches long, flattened semi-cylindric, twisted, the flat face with a shallow channel, the edges slightly rough, both sides of the leaf dark green, lineate with glaucous as in the Scotch pine, the sheaths on the young growth nearly three-fourths of an inch long, bright brownish at

base, thin and silvery white at tips, on older shoots much shorter, lead colored, the entire foliage rather dark in winter as in the Austrian pine. The cones are two years in maturing; those of the year in summer on stalks one-fourth of an inch long, are short, oval, erect, brownish purple, three or four in a cluster at the tip of the shoot; last year's cones at the base of present new growth, ovoid, one inch to one and one-half inches long, with prominent green scale-tips, the terminal scar on each gray brown, but little elevated.

Trees of this species have proven with us of very slow growth for the first few years, but after establishment their growth is sufficiently rapid. The spreading specimens require some attention to pruning to maintain a symmetrical head, and often the tendency to an open tufted growth will demand the shortening-in of the tender shoots, to thicken up the head to an agreeable density. We have lost very few of these trees in transplanting, when proper care has been given at the time, and they are not likely to suffer from drouth or heat if their situation is not entirely unfavorable. Taken altogether, we regard this pine as very desirable for Kansas lawns where the use of a tree of its character is admissible.

THE PITCH PINE,

Pinus rigida, is represented by some of the oldest trees now growing on the College grounds. It is one of the least attractive pines, and will not be planted for its beauty where other species will grow. It offers variety in the plantation, however, and for this reason, at least, its habit and behavior are worth noting. The general aspect of the tree is open and ragged, the foliage of a yellowish green of little character, and there is a tendency to the growth of leaves in tufts from adventitious buds on the lower exposed parts of the trunk, which increases the unkempt appearance of the tree. It may be recognized by the rather stiff leaves, three in a sheath, and measuring three to six inches in length; the sheaths in the new growth half an inch long, brown; on the old growth, less than one-fourth inch long, dark gray in color. The cones, borne singly, or two or three in a whorl, are oblong-ovoid, sessile, two or three inches long, and more than in any other, excepting perhaps the Table-Mountain pine, are persistent for years after shedding their seed. The scales of the cone are tipped with a sharp, short spine, and in opening spread less widely than those of most of the other species described. The bark is dark or obscure gray, very rough, showing the reddish color of the newer layers in the seams and rifts caused by the growth of the trunk in diameter. The tree seems to be perfectly hardy, but we have less experience in handling it than with others named, and can only judge from the present appearance of trees that are probably twenty years old.

THE SOUTHERN YELLOW PINE,

Pinus mitis, is represented in our collection by a few thriftily-growing young trees, five years transplanted from the nursery, and standing four or five feet high. There seems as yet no fault to be found with their growth so far

as hardiness is concerned; but as we judge from the limited opportunity for comparison at hand, we should be unwilling to place them alongside of the Scotch or Austrian pines in point of general usefulness.

THE WHITE PINE.

Pinus Strobus, that monarch of northern forests, is in Kansas of second value only, in our experience, as a tree for ornamental planting. Its form is always pleasing, but its hardiness is not yet beyond question. This pine may be distinguished from others likely to be met with in our nurseries and parks by the very slender, flexible, dark-green, glaucous-lined leaves, three to five inches long, in clusters of five, the sheaths on young shoots half an inch long, brownish, deciduous, leaving the bases of the leaf-clusters on older shoots quite bare. The natural form of the tree while young is a rather slender pyramid, with a straight central trunk bearing at intervals of one to two feet whorls of branches regularly disposed around the axis, and clothed with brushes of abundant slender leaves that give the tree a grace and lightness pleasing at all seasons, and shared by no other pine commonly grown. Young trees of this species are not difficult to handle, and in most cases may be relied upon to make for a few years a rapid growth, forming shapely specimens. The uncertainty as to their success begins after they have reached the height of ten or fifteen feet, when not infrequently the leaves redden, at first in tufts, and finally throughout, the tree dying; the cause is difficult to discover, but is connected, we surmise, with an uncongenial soil and the dry heats of summer. Our largest specimen, growing in a sheltered spot, is now eighteen feet in height, with a trunk-diameter of six inches at the base, and so far gives no hint of ill-health. Numerous other specimens, from four to ten feet high, in a variety of soils, from stiff yellow clay to black bottom loam, are at present looking well, and we have hopes that continued trial may prove our present judgment of the hardiness of this tree mistaken. No trees of this species have yet reached fruiting size with us, and we are unable to describe its cones.

THE NORWAY SPRUCE.

Picea excelsa, considered with regard to its uncertain resistance to unfavorable climatic conditions, is properly, among conifers, a tree of second place only, for planting in this region. It is, however, more commonly planted than other spruces, because it is cheaper, and more easily procured of nurserymen. It is naturally of interesting habit, not too formal, though of rather dark and somber green, except when the new growth is fresh. The young shoots are more or less flexible, often declined or subpendent. A few favored specimens on the College grounds are developing without pruning into very shapely forms, leaving nothing to be desired in this regard. However, they demand abundant room, tending to thin out and become ragged whenever crowded, and they will not thrive in the shade of other trees. The species is of more rapid growth than the others of this group upon our

list, an extension of the terminal shoot twelve to eighteen inches being common on established trees. With us it is impatient of drouth, and often suffers in the heat of summer. While in resistance to drouth it is superior to Douglas's spruce, it is in our judgment markedly inferior in this regard to both the white spruce and the Colorado blue spruce. It also recovers less certainly from transplanting than either of these two species, and we must place it below them in general thrift.

THE WHITE SPRUCE.

Picea alba, so far as we can judge by its behavior up to the present, is one of the best of the more ornamental evergreens for planting in middle and eastern Kansas. It is with us one of the hardiest of its kind, and is superior both in this respect and in beauty to the Norway spruce. Its growth is slow, and its neat form is retained with little need of pruning. It displays rather more than other evergreens a tendency to grow occasionally two leaders, and if these are allowed to compete in growth, the trunk is divided in a manner that later detracts much from the beauty of the specimen. There are now on the grounds of the College individual trees of the age of at least fifteen years, the largest of which are sixteen feet in height; but these specimens stand well protected by clumps of pines, and have thus an advantage over others of apparently equal age, though of smaller size, in other parts of the lawn. These trees of the white spruce are the finest large specimen spruces of any species in this vicinity. Younger trees grow annually six to eighteen inches in height; the young shoots are stiff and erect, or extended in the line of growth of the branch, with rigid, acute leaves thickly set, especially above and along the sides of the shoot; the color generally a beautiful glaucous green.

The most striking of the spruces grown on these grounds at present are specimens of

THE COLORADO BLUE SPRUCE.

Picea pungens, a tree that in hardiness is fully the equal, and in distinct beauty is the superior, of the white spruce. The special characteristic of this spruce is the pronounced glaucous hue of the foliage, which in the best individuals is very decided, and merits the name by which the species is commonly known. The "bluest" specimens occur in small proportion in seedlings, taken as they grow, without selection, yet the species is in all cases a handsome tree, individuals of even a less-decided color being a glaucous green that if not contrasted with brighter colors of the best of their kind, would be highly esteemed. Trees of the Colorado blue spruce are of rapid growth, moderately regular, and sufficiently compact in form, and without much need of pruning will grow into well-formed specimens. Their characteristic beauty is but little dimmed by winter or drouth, and if they are given a fair start in planting, they seem scarcely to suffer a check under the worst weather that occurs in this part of the State. The annual growth is rigid and erect, and reaches in the best trees a limit at ten to twelve inches.

The leaves, often an inch long, are stiff, with acute points, and are equally distributed around the shoot. We have lost relatively a smaller number of trees of this species in handling than of any other evergreen, excepting perhaps the Scotch and Austrian pines.

We are sorry not to be able to speak with as great commendation of another very beautiful species,

DOUGLAS'S FIR.

Pseudotsuga Douglasii, which, in spite of the botanist's remonstrance, seems likely to continue to be known among planters as Douglas's spruce. We cannot object to this tree on the score of appearance, as in color the best specimens equal the blue spruce, and in habit some think it excels the latter. Its new growth is less rigid, and in well-established trees is often gracefully pendent, after the manner of that of the Norway spruce. The spray is flattened and very broad, the inch-long leaves being arranged along the sides of the shoot, and in color varying from the glaucous green of the white spruce to the rich "blue" of a fine *pungens*. The growth of this tree compared with the latter is much more open and irregular, this habit not an objection, however, where variety in beauty is desired. It shows with us a greater tendency to an ill-balanced growth, and contends with poor success against our drouthy summers and winters. It is also one of the more difficult trees to transplant successfully, and is apparently particular about its soil. Trees seemingly well established will sometimes redden and die in spring, with no cause assignable, at about the time when others are pushing their buds. Noting the behavior of such trees in the summer previous has suggested to us that the species is first injured in the dry heats of our August weather; and, perhaps, weakened by this, they find in the no less dry winds that occasionally come in winter, the final stroke. As another objection, not occurring perhaps in the experience of others, we note in our trees the frequent failure of the leading shoot, which at least for a time leaves an unsightly tree.

To sum up: Our experience with this naturally handsome tree will not allow us to recommend it for this region; yet partial success in good soil and with protection from the southwest, warrants us in continuing it in our trial plantings.

THE WESTERN SILVER FIR.

Abies concolor does not seem at home in this soil and climate. Specimens alongside of the Douglas's fir are inferior in hardiness and growth to this species, and in these points are not to be compared with the Colorado blue spruce in adjoining rows. This delicate constitution is greatly to be regretted, as the habit of this tree is such that, if hardy, it would be unapproachable as an ornament to our lawns. The spray is like that of Douglas's fir, more or less flattened, especially on old shoots. The leaves, which are two and one-half inches long, are narrow and flat, with a slight keel on the under side, and of the same pronounced glaucous "blue" so highly prized

in the other western species. They are more or less flexuous, and the whole aspect of the tree in its new growth has a delicacy rare among conifers. We regret that all we can say in its favor is that it will survive and grow, though slowly, and only when in the most favorable situations. Our specimens have shown a tendency to a peculiar suppression of the tips of the new growth by a twisting or knotting of the leaves and of the end of the succulent shoot, the cause of which we have not determined.

THE SIBERIAN SILVER FIR,

Abies pichta, or *Sibirica*, we have had on trial for several years, and with our present information must class it among the failures. It shows, the least of all the spruces and firs in the present enumeration, the ability to thrive under the conditions which it must endure in this section.

THE AMERICAN ARBORVITAE,

Thuja occidentalis, we cannot consider fully successful here. In some of its varieties it is sufficiently promising, however, to warrant us in continuing our efforts to establish it. We have specimens seven or eight years old that are now in perfect health and vigorous growth, but we have lost more, several times over, than we now have growing. There are a few trees in this vicinity that have attained the height of twelve or fifteen feet, and are still thrifty, but these are exceptionally well protected, and are in the more favorable soil of the bottom lands along the river. Trees of this species in all cases demand protection from the scorching southwest winds, with a cool, moist soil about the roots, and as ordinarily planted, are certain to be injured by hot, dry summer weather. Of the named varieties of this species that we have tried, we have found encouragement for continued trial of the "Little Gem," a very dwarf and compact tree, with the foliage of a darker and more durable green than the taller forms of the species. In the lower situations and moister soil of favored spots on the College grounds, when protected from the hot southwest winds, the trees of this variety have made a fairly satisfactory growth, and appear sufficiently hardy. We have had little success, however, in our efforts to establish specimens in more exposed situations and in clay soils. Douglas's "Golden" and "Pyramidalis" varieties, with that other "golden" sort catalogued as "Hoveyi," in the limited trial we have made of them, seem to be quite unreliable, the most of the trees dying the first season after planting, and none surviving the second.

THE SIBERIAN ARBORVITAE.

Thuja Sibirica of Meehan's Catalogue, appears, after our five years' trial of it, to be of all arborvitae the most worthy of general planting. Of this species (or variety?) we have so far lost not a tree, and the growth and aspect of our specimens, at present, promise as well for the future. In appearance this tree is superior to the American, the foliage being a more handsome green, and the form more regular and less likely to be ill-balanced, open, and straggling.

THE DECIDUOUS CYPRESS,

Taxodium distichum, is a well-known native of swamps and river lowlands in the Southern United States, and many people regard it as suited for such localities only, while in fact it is a tree of considerable interest and of apparently perfect hardiness on dry uplands, as is sufficiently attested by our experience with it. The oldest specimen on our grounds was planted by Prof. Gale about eighteen years ago. It was then a tree two or three years old. It is now twenty-three feet in height, has a circumference at one foot from the ground of four and one-fourth feet, and is in every way a handsome and healthy tree, attracting the attention of many by its peculiar habit and rich yellowish green, feathery foliage.

The leaves of this cypress are narrowly linear, flat, half an inch long, and arranged in two ranks on opposite sides of the slender green branches of the year's growth. They are late in appearance in spring, and in autumn turn a reddish brown, in young specimens often with a decided autumnal brightness. They are shed at length, and with them fall most of the slender twigs that have supported them during summer. The tree is of rapid growth, broad conical in outline, and in winter, when its branches are no longer clothed with foliage, it is more striking than beautiful as a lawn ornament. Young trees are very attractive when in leaf, most so in spring when the leaves are first fully expanded. This species has not fruited with us, and we have not seen its cones. We have found it to be quite easily transplanted, and have lost but few trees from any cause. While the twigs are occasionally injured in winter, the tree stands hot, dry weather apparently as well as most of our natives. Altogether this tree may be regarded as well worth planting where variety is desired, or in places where a tree of habit more peculiar than graceful is admissible.

THE GINGKO OR MAIDENHAIR TREE,

Salisburia adiantifolia, is a native of Japan, and was added to our list of trees on trial, without much expectation that it would outlive the year. We are so far agreeably surprised in its behavior, however, as almost every tree that has been given proper care is now healthy and in fairly good shape. Specimens of the ginkgo at once attract the attention of tree-lovers by the character of the foliage, which is made up of broad, fan-shaped, parallel-veined leaves, like the divisions of the frond of the maidenhair fern on a larger scale. When grown in good soil and in protected situations, trees of this species are likely to succeed with us, but we cannot rely upon them in clay upland, exposed to the sweep of our heavy winds. The stem of younger trees is quite pliant, and the tree is easily blown over. In some seasons its shoots suffer from severe frost, and we have also noticed that the trunk is exposed to sun-scald. On account of the singular beauty of its foliage, however, we are still inclined to recommend this tree for trial by all who are willing to give it proper care and protection.

THE EUROPEAN LARCH,

Larix Europoea, is a third deciduous conifer that we have growing at present in a manner that encourages its further planting. It is true we have lost a great number of trees of this species in our different attempts to establish it, but mainly through the difficulty of getting at the work of transplanting early enough. The buds push so early in spring that the trees are usually too far advanced before the ground is yet in condition to work; and they are not often successfully transplanted after the buds have pushed to any extent. It is better to lift the trees in the fall, and store them over winter in a place where their spring growth will be retarded as much as possible until the ground is open.

FAILURES.

In the list following are named species placed on trial in our grounds at various times, but not now represented in our collections. Some of the species, it seems, ought to succeed with us, and perhaps further trial may allow us to say something in their favor. But the difficulty seems to be to establish them in the face of dry weather, the majority succumbing after two seasons' effort.

This list is as follows:

- Cedrus deodara* Deodar Cedar.
- Libani* Cedar of Lebanon.
- Cupressus Lawsoniana* Lawson's Cypress.
- Juniperus communis* var Irish Juniper.
- Pinus contorta* CaliforniaScrub Pine.
- edulis* Pinon.
- excelsa* Bhotan Pine.
- Jeffreyi* California Bull Pine.
- Laricio* Corsican Pine.
- Massoniana*.. . . . Masson's Pine.
- ponderosa* Colorado Yellow Pine.
- ponderosa*, var. *Benthamiana*. California Yellow Pine.
- Retinospara ericoides* Japan Cypress.
- filifera* "
- leptocladus*. "
- obtusa* "
- plumosa* "
- squamosa* "
- Sequoia sempervirens* California Redwood.
- Thuja occidentalis*, var. *aurea*. Douglas's "Golden" Arborvitae.
- occidentalis*, var. *pyramidalis* Douglas's Pyramidal.
- occidentalis*, var. *Hoveyi* Hovey's "Golden."

