

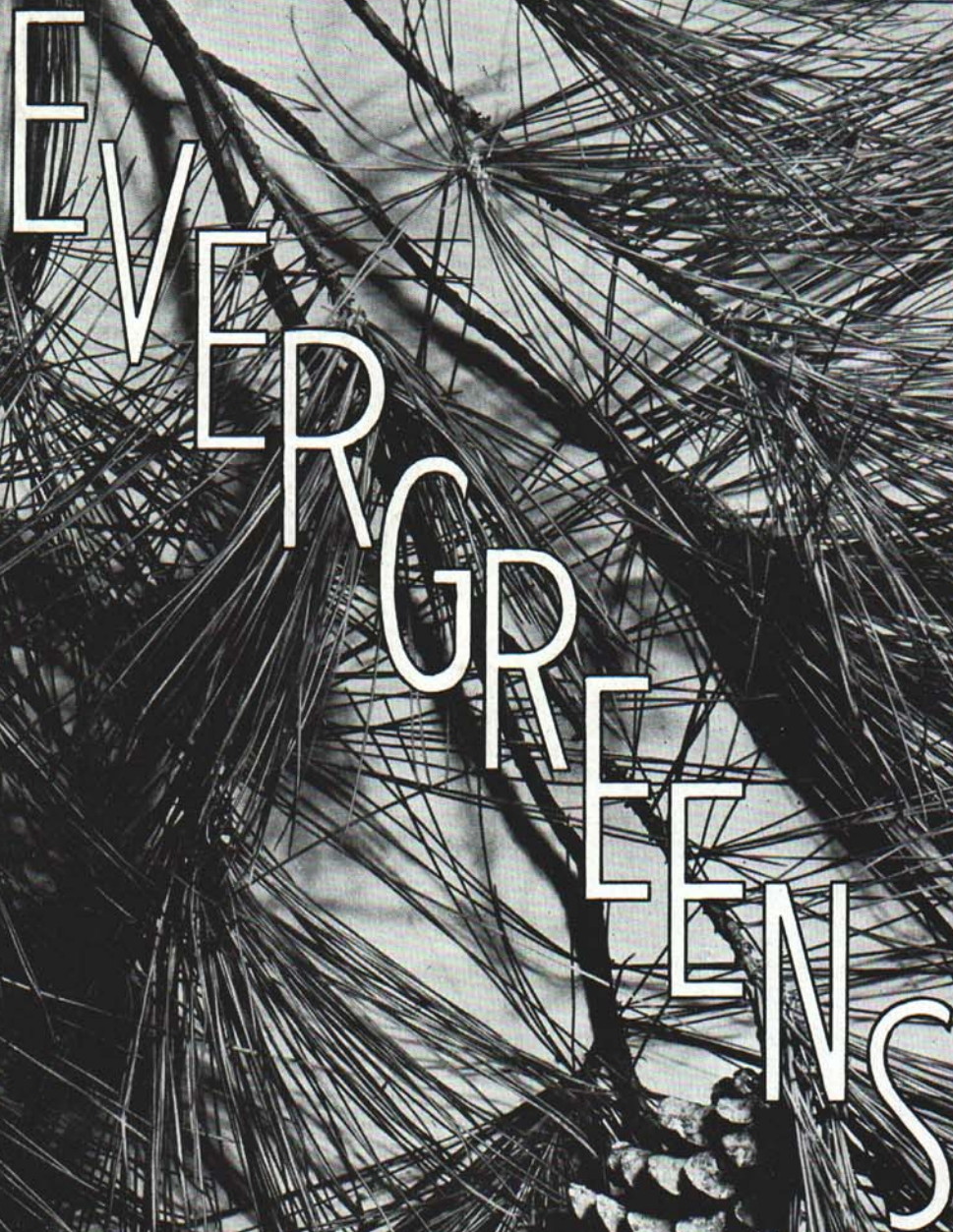
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Michigan State University Extension Service
Charles W. Barr
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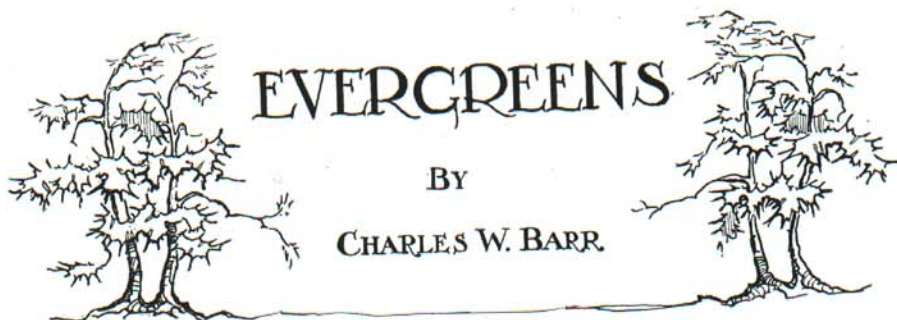
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EVERGREENS

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COOPERATIVE EXTENSION SERVICE
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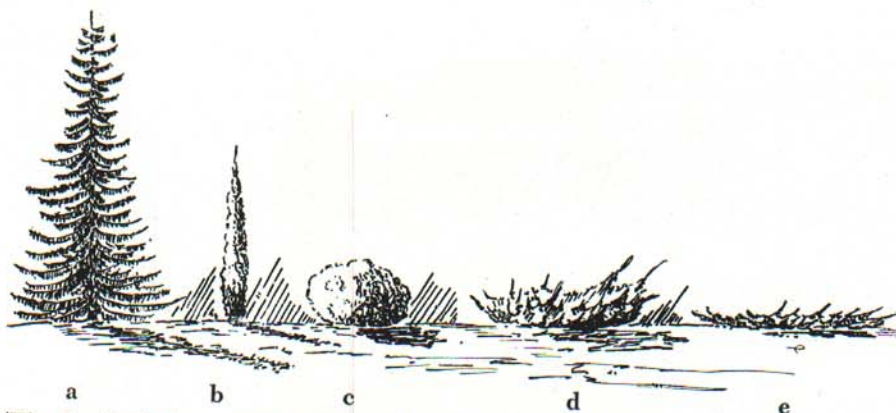


USE OF EVERGREENS IN THE LANDSCAPE DESIGN

The universal love for trees is shown in the history of every race of people. Each succeeding generation of admiring, even worshipping people has recorded by painting, poetry, or prose its regard for the kings of the plant world. In the past, kings and noblemen preserved trees in their hunting preserves; today, we preserve majestic monarchs like the redwoods and the extensive stands of murmuring pines in national parks and forests. Such large-scale effects cannot be reproduced, however, in the average garden area, but the beauty of a few trees may be had as a reminder of those larger plantings.

There is something distinctive, yet indefinable in the character of an evergreen tree. The tall fir may be commanding in its symmetry and the Norway spruce attractive in its quiet, graceful way, but even the spreading juniper clump in the pasture and the broken pine at the edge of the woodlot attract more than their share of attention. There is a solidity, a difference in form and foliage character that quickly separates the evergreens from the deciduous plants. That is probably why so many people desire them about their homes and in the garden, but it is also the reason why greater care must be exercised in their selection and placement.

Despite their natural beauty and the appeal that they make, few plants are more frequently misplaced or ill-chosen for the garden picture that is to be created. This is due partly to the great variation in size, form, texture, and color of evergreens and partly to the too frequent assumption on the part of the planter that one evergreen is as good as another, regardless of the requirements of the place where it is to be used.



(Fig. 1. Typical evergreen forms. (For explanation of the forms, see text, page 5.)

It is to be remembered that cheap evergreens may frequently be the more expensive. Skill, patience, and years are required to produce the spreading, creeping, and dwarf pyramidal forms that are needed to give the home a proper setting over a long period of time. These plants must of necessity be more expensive than the larger, faster growing trees raised from seed. Such inexpensive kinds soon become crowded, grow out of bounds, and lose in large part the fleeting attractiveness that they may have possessed during the first few years following their planting; then they must be replaced, which multiplies the cost of the original planting.



Fig. 2. The spreading type of evergreen may be used about the vertical accenting plants, or below windows.

When considering evergreens for a planting, visualize first what shape the plant should have for that particular location. There are four distinct forms among the evergreens (Fig. 1): first, the spiry form (Fig. 1a) which may be separated into the larger type like that of the spruce and the smaller, more slender pyramidal type (Fig. 1b); second, the round or globe-like type (Fig. 1c); third, the spreading or shrub type (Fig. 1d); and the fourth, the creeping form (Fig. 1e). Each evergreen plant shows its distinctive form when small and will continue to grow in that shape, in most cases, as long as it lives. This is not true of most deciduous plants. Consequently, one should be more



Fig. 3. An upright evergreen is necessary in this case to break up the wall space formed by the shutters and the door frame. The upright plant may be a Pyramidal Arbor-vitae, Irish juniper, or Redcedar. The low forms may be Savin junipers, Pfitzer junipers, or Dwarf Japanese yew.

able to choose the proper evergreen for each planting if the ultimate height is remembered.

The smaller members of the pyramidal groups, such as the Irish juniper and Redcedar, are used as accents at the corners of the house (Fig. 2), beside the doorway (Fig. 3), on either side of a wall fountain, at the corner of a formal garden, and similar places.

The round or globe-like plants are useful mainly as accents in the formal, or pattern garden and as architectural accents at each side of steps, but never in groups. They will not blend nor merge together into a group any better than basket balls would. The low, compact dwarf forms like the Maxwell spruce are only useful in the rock garden.

The spreading type is probably the most useful of all for foundation planting (Fig. 2) and general use about the small garden. This group includes such plants as the Pfitzer juniper which will group together well, harmonize with deciduous shrubs, and soften the severe lines of the more pyramidal forms.

The creeping evergreens may be used in the rock garden and for covering small slopes.

Many of the horticultural varieties with inverted forms, like the Sargent Weeping hemlock, are grotesque curious cripples and should not be used in the plantings about the home. They should be planted only in a park or arboretum, for the student of plant forms, but not as a part of a beautiful landscape design. Highly colored varieties should also be omitted from the informal, naturalistic plantings, but may be used sparingly as accents in a formal type of planting.

EVERGREENS IN THE GARDEN AREA

Because evergreens are seen most frequently about the foundation walls of the home many people seem to feel that they can only be used in such locations. Actually, evergreens can also be used to add interest to the boundary plantings of the general garden area.

In the garden composition, individual specimens are frequently used to emphasize the design, but more often the plants are massed in groups or in borders, which creates an entirely new problem as to the selection. Individual plants, when grown in the open, tend to assume a balanced, symmetrical form as each twig seeks to place its leaves in the sunlight. This is true for the common dandelion found on the lawn, the wide-spreading shrub which sends so many branches upward from a common base, and for the various evergreens with only one

central trunk. Thus, the selection for free-standing specimens in the garden is quickly narrowed to those which will not outgrow the space allotted to them. But the selection of evergreens to mix into the general shrubby border is not as simply made.

Before considering the effect of crowding into masses, there should be an understanding of the term "texture." It designates the general character of a plant's foliage, just as it designates various weaves in cloth, and is the result of the size and surface exposure of the leaves combined with the density of their distribution upon the twigs. Plants whose leaves appear large at the first glance invariably have a coarse textural effect in the garden. Examples of this include the Plantain-lily, Snowhill Hydrangea, and the Catalpa. At the other extreme are the fine-textured plants whose small leaves give an effect of softness and delicacy.

The small leaves of most evergreens should place them into the class of fine-textured plants, but such is not always the case. The leaves are frequently so numerous and so closely set along the twigs that they give an appearance of solidity. If the branching system brings these densely-clothed branches together, the plant is said to have a heavy or dense texture to distinguish it from coarse-textured plants. The upright Junipers are included in this group. If the branching system is open and allows the sunlight to be seen through the crown, a much lighter appearance and finer texture results. Such is the case with the Scotch Pine.

In large masses or groups, there may be an introduction of contrasting texture or color to create individual pictures within the garden design. Thus, one plant group can be made to stand out distinctly from a background of other plants. For example, a Norway Spruce makes an excellent background for a white-barked birch or flowering crabapple; an evergreen hedge as a background for a perennial border. Such contrasts will give highly satisfactory results, if they are used at important points of the general design; but the remainder of the planting must create a background that will fulfill its function without attracting too much attention. Evergreens will also add a rich variation to the textural pattern of the garden when intermixed with deciduous trees. If such an effect is desired, the open-branching trees should be used. A good example of this would be a mixture of pines and flowering dogwood.

The natural tendency, when planting evergreens in the boundary

planting, is to place them in close regular groups and forget that they will grow in height and breadth. Imagination and vision are required to picture how a large evergreen tree will fill in with lilacs, flowering crabapples and other ornamental plants. But, such vision is necessary, otherwise, a group of tightly pressed plants with their heads flattened into each other and a mass outline of little interest will result. It is also necessary to remember that such evergreens as the Junipers will not stand much crowding or shading without losing their leaves, while the Hemlock might be ideal for those conditions.

Plants which attain a dense columnar or pyramidal form without pruning are frequently called "formal types," because their character seems to fit the geometrical type of garden. Therefore, it is not desirable to use them among the drooping, graceful types of shrubs which are so necessary for the "natural" style of gardening. For the same reason, those trim types do not group well, but are valuable only as specimens to accent the key points in the design. Too many tall, vertical forms, however, are likely to create a feeling of confusion. If they are in the center of the garden, the area will appear smaller, but if they are placed at the outer points of the design and low, horizontally-spread forms are used in the center, the eye will be carried to the boundaries and the garden will seem larger.

EVERGREENS IN THE FOUNDATION PLANTING

Some houses do not look well with an evergreen foundation planting. Red-brick or dark-colored homes frequently appear dull and uninteresting when surrounded with the dark-foliaged evergreens, but have a sparkling and inviting appearance when flowering deciduous plants are used. On the other hand, evergreens give an emphatic note to the planting when used in contrast to a light-colored home.

The broad front of the Colonial and Spanish type of house looks exceptionally well when evergreens are used to emphasize the important vertical lines (Fig. 2), but the tall, narrow house looks better when planted with the more irregular, rounded forms of deciduous shrubs. Pyramidal and upright evergreens only accentuate the narrowness of this kind of house front, while the broader base created by the deciduous shrubs makes the house appear better proportioned.

Regardless of what type of house it is, the majority of evergreen foundation plantings would look better if some deciduous plants were mixed in with them. Evergreens are so definite in their outlines and

their color of foliage so similar, except for the brightly colored forms, that the deciduous plants help to lighten the planting and add more gracefulness and contrast. This is especially true during the summer and autumn, when the deciduous shrubs offer flowers, fruits, and autumn coloration for interest. During the winter the evergreens carry the burden of furnishing interest and color. By using such a combination it is possible to obtain a pleasing all-year-around effect with a seasonal change. When combining the two classes of plants in this manner, one or the other should dominate. Never have an equal amount of deciduous and evergreen material in a planting.

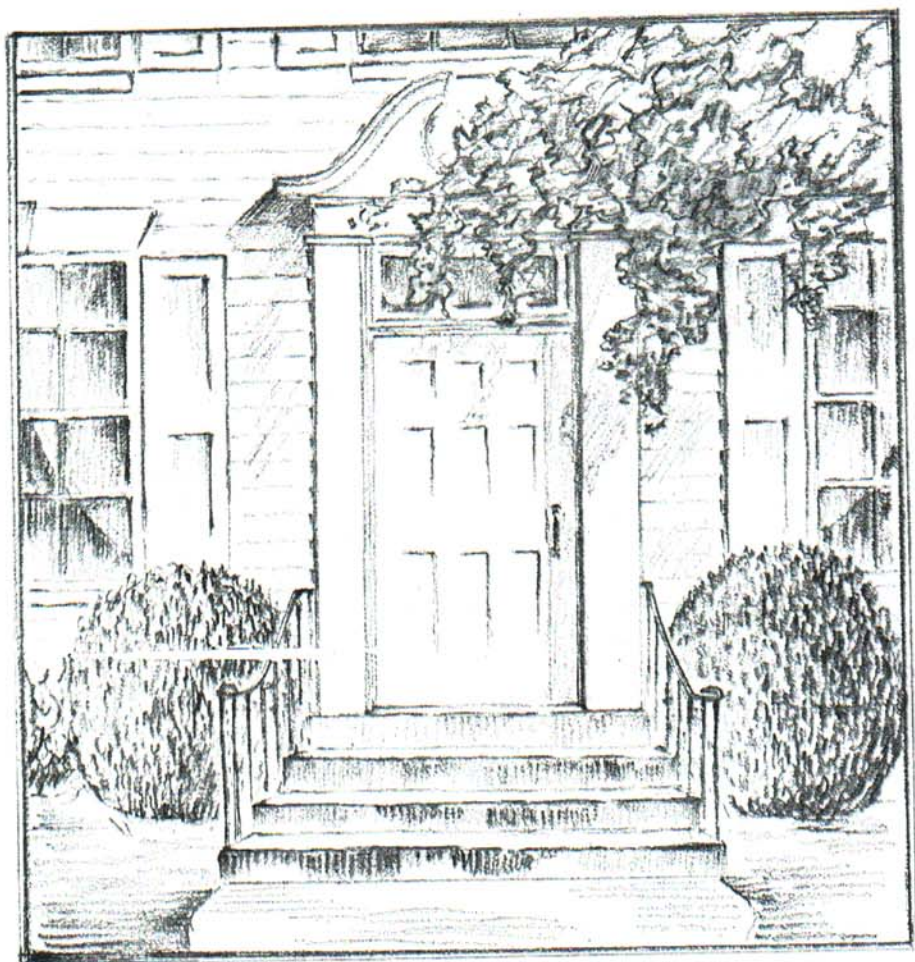


Fig. 4. The globe form will make a raised colonial doorway seem closer to the ground. The Mugho pine may be used in this manner.

When combining evergreen and deciduous plants in the foundation planting, it is best to use tall evergreens like the Redcedar, American Pyramidal arbor-vitae, and Chinese juniper as accents at the important points, such as the house corners, corner of the sun-porch, and so on, and the shorter pyramidal types like the Irish juniper beside the doorway (Fig. 3) unless the house is very large. About them as edging shrubs, may be placed the flowering shrubs to relieve their stiffness. Beneath the windows and other places where a low planting is desired, may be planted the Pfitzer juniper. Savin juniper and similar evergreens if flowering shrubs are used about the tall evergreens at the corner; low shrubs like the polyantha roses, deutzia and Lemoine mockorange may be used under the windows if evergreens are used for edging the corner planting. Occasionally, a Globe arbor-vitae, Mugho pine or Irish juniper may be used as an accenting form beside the doorway (Fig. 4), or at each side of the entrance steps, but they should never be used in groups.

THE PLANTING AND CARE OF EVERGREENS

Transplanting

Evergreens demand great care when being transplanted as their leaves are giving off moisture all of the time. It is necessary, therefore, for the roots to absorb water from the soil winter and summer. Otherwise, the leaves would lose their moisture by transpiration and turn brown.

To prevent as much as possible, the drying of the roots, the evergreens are transplanted with a solid ball of earth about the roots, which is kept in place by a burlap wrapping. The wrapping should not be removed. The nursery company will also have the branches securely tied to prevent injury, and they should remain in this fashion until the tree is planted.

It is advisable to plant evergreens as soon as they are received. If this is not possible, soak the earth ball (burlap and all) in a tub of water for five minutes, or longer if the earth is dry. Then stand the tree in a sheltered place away from sun and wind.

The evergreen tree should be placed in a hole that is deep enough to permit the top of the ball to rest two inches below the ground level. This will guarantee the roots enough covering after the ground has settled to prevent their becoming dried out and will provide a basin for the collection of water during the first year. The hole should also

be large enough in diameter to allow at least one foot of newly packed soil, rich in decayed vegetable matter, to be placed about the ball on all sides. This extra effort will help the roots to spread and will make the ground more capable of holding water for the newly transplanted tree.

When planting, leave the burlap around the ball and tamp the loose earth used for refilling about it firmly with your foot. When the hole is two-thirds filled, flood with water, and then continue filling the hole. If there is too much burlap about the base of the trunk, the string may be cut and the burlap folded back so that it will be flattened under an inch or two of soil.

Immediately after planting allow a slow trickle of water to settle the dirt still more firmly about the roots and then place some dry soil on top to hold the water and bring the ground level to the proper height. The large upright trees should then be firmly staked, or guyed, to prevent their swaying back and forth.

Cultivation

It is best to keep the ground cultivated from the trunk to one foot beyond the branches for at least two years. This will hold the moisture in the ground and prevent weeds from growing. Peat moss worked into the soil will also help to hold the moisture but does not eliminate the need for cultivation. A heavy mulch of peat moss will prevent the normal rainfall from penetrating the soil very far, which may cause the roots to grow close to the surface of the ground. If this should happen, the roots would be severely injured by the heat of summer and cold of winter if the protective blanket were ever raked away.

If the trees are planted in the spring, they should be watered for several hours every 10 days, or every week in extremely dry weather. If they are planted in the fall, they should be watered until the ground freezes. *Few evergreens planted about the home grounds die from too much water.* After the ground freezes, cover the cultivated area with a mulch of straw (but not manured straw), hay, or leaves and wet the mulch, or cover with wire netting, to prevent it from blowing away. This mulch could be 6 inches deep but should not come in contact with the branches, or trunk. A mulch of this kind holds the frost in check, preventing the ground from being frozen too deep. This mulch should be removed gradually when the ground begins to thaw in the spring.

Evergreen trees may be transplanted in September as soon as the fall rains begin and from then through October. In the spring the trees may be transplanted as soon as the soil is workable, but not after they have started their new season's growth.

Soil Requirements

A loose, sandy loam that is well-drained gives the best results for most cone-bearing evergreens. A very stiff clay soil should be mixed with a generous supply of sand and peat moss to make it porous enough for easy root growth and to provide drainage. If this is not practical, low-growing forms may have their roots underlain by two feet of gravel to supply drainage. Care must be taken that a pool of water will not collect about the roots of the plant because the clay is so heavy that the water trickling through the looser soil filled around the ball cannot seep away. With the exception of a few species like the larch and arbor-vitae, evergreens will not grow when the ground is wet, soggy, or poorly drained.

Pruning

The beauty of most of the tall upright evergreens lies in the whorls of branches that radiate like spokes in a wheel, tier above tier, and in their tapering symmetry. If the wide sweeping lower branches are removed, the beautiful tapering effect is lost and the chief beauty of the tree is gone. Therefore, no entire branch is removed from an upright evergreen unless it is dead, or diseased, in order to preserve the natural form. If a branch needs to be shortened, as may happen if the tree is one-sided, the branch should be cut only in the early spring and should include one or two years' growth. If the branch is cut below the foliage line, it will seldom succeed in forming new growth and it is better to leave a margin of safety.

The informal type of juniper, whether it has a spreading or upright habit of growth, frequently needs judicious branch pruning to keep it within bounds. If this is necessary, cut the long branches just above a vigorous side shoot on the second or third year wood, but at the same time avoid having all of the branches the same length, which would destroy the irregular, informal outline.

Small specimens of the pines, firs, and spruces may be made denser and more uniform in appearance by removing the terminal buds of the stronger branches. This will force the side buds to grow and also help

the weaker shoots to make an additional growth. The buds should be removed in early spring before the new growth has started. Mugho pines, especially, may be kept dense and within bounds by this method of pruning.

The softer foliage trees, like the yews, arbor-vitae, and junipers, may be sheared to form an even growth, or to create a more definite shape. Shearing is done just as the new growth appears and by clipping the tips of the branches with a sharp pair of hedge shears. This method is primarily used when the trees are being used in formal gardens, or other formal developments, and for making young trees denser. If an informal shape is desired, the tree should not be sheared more than twice and then when it is small.

EVERGREEN DESCRIPTIONS

ARBOR-VITAE

Genus Thuja

Eastern Arbor-vitae, American Arbor-vitae, White Cedar

*Thuja occidentalis**

The Eastern arbor-vitae is a good tree for large plantings in parks and on extensive lawn areas in the city, as well as in the rural districts. It is also good for hedges, screen plantings and windbreaks. The chief

**Nomenclature*—"The naming of plants under rules of nomenclature is an effort to tell the truth. Its purpose is not to serve the convenience of those who sell plants or write labels or edit books; it is not commercial. Serving the truth, it thereby serves everybody. In the end, nomenclature rests on the plants rather than on printed regulations."

—LIBERTY HYDE BAILEY.

Nomenclature means the naming of things under a system and, in this case, refers to the classification of trees by their botanical names. The many common names given to plants of all kinds are of local value only, as they do not identify the plant by a recognized system.

In contrast to the common names are the botanical names, or binomials. They, immediately, place the tree within a certain group and at the same time separate it from all the other members. Furthermore, the botanical names can be used as identification tags for those plants all over the world. However, there is also confusion among the botanical names.

A basic principle in the naming of plants is priority of publication. A starting point, upon which to base priority, is the first edition of Linnaeus' *Species Plantarum*, 1753. Since the system of nomenclature advocated by Linnaeus was not generally accepted until many years later there have been many changes in names necessary as research among the old accounts has progressed. Confusion also arose from the lack of comprehensive and careful rules concerning the naming of new discoveries.

To obtain order out of chaos, a code for nomenclature was suggested by a botanical congress held in Paris in 1867, but it did not please some American botanists. In 1904 a radically different code was accepted in Philadelphia by the Americans, which was proposed for general acceptance at the International Botanical congress held in Vienna in 1905 but was refused in part.

Other international meetings were held in 1910 and 1930 when certain adjustments between those two codes were made. Today the botanists of the world are practically unanimous in their acceptance of the 1930 International Code. For that reason, the international rules of botanical nomenclature as given by Alfred Rehder of the Arnold Arboretum are used in this bulletin. For clarity, the names given in Standardized Plant Names, published in 1942, by the American joint committee on horticultural nomenclature have also been given and is used as the authority for common names.

objection to it is the browning of its foliage toward the end of the winter.

It is a narrow pyramidal tree, 60 or more feet high. The twigs are arranged in flat horizontal planes (Fig. 5) and covered by leaves that are, individually, scale-like, dark green above, and yellow-green below. The whole structure forms the typical frond-like branch that is so familiar.

For those people desiring naturalistic plantings the Eastern arbor-vitae is very good, but there are approximately 50 varieties of this tree, which vary in form and color enough to answer, in a much more satisfactory way, individual requirements. The following are some of the better varieties:

Var. *Douglasii aurea*—DOUGLAS GOLDEN ARBOR-VITAE. The foliage of this variety is a bronzy-yellow in spring, but is not as bright as that of the George Peabody arbor-vitae. The Douglas Golden arbor-vitae is a bushy pyramidal tree 15 feet high.

Var. *Douglasii pyramidalis*—DOUGLAS PYRAMIDAL ARBOR-VITAE. This is a slim compact tree that will grow more than 25 feet high, at the rate of approximately six inches a year. Its foliage is dense, with fronds that are smaller than those on the American Pyramidal arbor-vitae, and a much darker, glossier green. This tree is especially fine for screening and accent planting, and may be used as a substitute in northern gardens for the Italian cypress.

Var. *Ellwangeriana*—ELLWANGER ARBOR-VITAE. Some arbor-vitae show their kinship with the genus *Chamaecyparis*, and the *Ellwangeriana* is such a variety, as the exterior foliage is composed of the typical leaves found on the Eastern arbor-vitae and the interior foliage of fine linear leaves that are typical of the *Retinosporas*. In outline, this variety is slightly pyramidal and very compact, which may be used in foundation plantings, or for low hedges.

Var. *fastigiata* (var. *pyramidalis*, var. *stricta*)—PYRAMIDAL EASTERN ARBOR-VITAE—AMERICAN PYRAMIDAL ARBOR-VITAE. Next to the Douglas Pyramidal arbor-vitae, this variety is the best of the pyramidal forms. It forms a compact pyramid, 15 to 20 feet high, and 6 feet across at the base. The fronds are glossy, dark green, and do not change color appreciably during the winter. It may be used as a tall accent at the corners of buildings, for narrow screen plantings, as an accent in formal gardens, or for forming a hedge of medium height. It is rather slow growing.

Var. *globosa*—AMERICAN GLOBE ARBOR-VITAE, TOM THUMB ARBOR-VITAE. This is one of the best of the globular forms, and is so slow-growing that it will only be 6 feet high when 35 or 40 years old. It is regular in outline and dense with yellowish-green leaves that are placed in a vertical position. It may be used as an accent in the foundation planting of a colonial type of house, on each side of the entrance step (Fig. 4), or any other similar type of an accent. The Tom Thumb arbor-vitae is a selection of this variety which is slightly smaller and may be used in the same manner.

Var. *lutea* (var. *elegantissima*)—GEORGE PEABODY ARBOR-VITAE. This tree is a narrow, pyramidal type, 10-15 feet high, and has bright yellow



Fig. 5. Note the scale-like foliage of arbor-vitae.

foliage in the spring. It is denser, more upright growing, and yellower than the *Vervane* arbor-vitae (var. *Vervaeneana*).

Var. *pumila*—"Little Gem," GREEN GLOBE ARBOR-VITAE. For rock gardens, this is one of the finest of the dwarf forms, and is so slow-growing that it will attain a height of only 5½ feet in 50 years. It is a compact globular variety that spreads like a low cushion among the rocks when young. The foliage is a shiny dark green and keeps its color all winter.

Var. *Reidii*—REID ARBOR-VITAE. It is a broad bushy tree, four feet high, with small dark green leaves that retain their color well during the winter. Its foliage has a tendency to become thin. It may be used in foundation plantings and for edging down larger evergreen groups.

Var. *robusta* (var. *Wareana*)—WARE ARBOR-VITAE, SIBERIAN ARBOR-VITAE. This is a broad pyramidal or conical type with short stiff branches and a symmetrical compact head. It grows from 12 to 15 feet high and has dark green foliage that is more deeply crested than the species. The foliage does not brown during the winter, and the plant is one of the best varieties of its type to use about the home.

Oriental Arbor-vitae

Thuja orientalis

In southern Michigan the Oriental arbor-vitae is half hardy, although specimens on the Michigan State College campus have withstood occasional temperatures of 20 degrees below zero. Normally it is a broad pyramidal tree with vertical fronds of small heavily crested, scale-like leaves (Fig. 6). The leaves are bright green on both sides of the frond, except in very severe weather when they assume a brownish tone. Where low temperatures occur, this tree becomes rather open in its habit of growth, after reaching a height of about 10 feet, but under warmer conditions it stays bushy and symmetrical.

For practical landscape purposes, this tree can be considered in southern Michigan as a slow-growing pyramidal tree that will grow up to 10 feet high and be useful for foundation planting and for formal plantings when protected on the north and west sides.

In southern states the nursery companies handle many varieties of the Oriental arbor-vitae, but as a group they do not prove satisfactory in Michigan and are therefore omitted.



Fig. 6. Oriental arbor-vitae.

FIR

Douglas Fir*

Pseudotsuga taxifolia (Pseudotsuga Douglasii)

No other evergreen east of the Rockies ranges so high as the Douglas fir and retains such a symmetrical compact outline, when grown in the open (Fig. 7.) Its lower branches will persist and sweep almost to the ground, while the top of its crown is more than one hundred feet high. It is an extremely handsome tree, with more strength in its appearance than is possessed by the true firs, or spruces, and yet, is just as graceful as any of the latter groups. The Douglas fir is a rapid grower and may be used as a specimen, or for screen planting.

*The Douglas fir is not a member of the true Fir family (*Abies*), and is inserted ahead of the members of the Fir family solely for the reader's convenience.

The foliage is dense as the leaves persist approximately eight years before falling. The leaves are flat, one inch long, and narrow. They are dark bluish-green on the upper surface and have two distinct white lines on the under side.

The cones of the Douglas fir are unusual in their character and furnish a fine distinguishing characteristic. They are 2-4 inches long and have long curving bracts, or modified leaves, extending out between the scales for at least an inch (Fig. 8). None of the other commonly cultivated evergreens have those bracts coming from the cones.



Fig. 7. The Douglas fir is a handsome tree with an appearance of more strength and grace than the true firs.



Fig. 8. The cones of the Douglas fir are distinctive and furnish a very fine distinguishing characteristic.

FIR

Genus Abies

The genus *Abies* includes a group of stately pyramidal trees whose branches are arranged in regular whorls. They are easily distinguished by their flat, narrow leaves (Fig. 9) which appear as though they were in a V-like arrangement along the twig, but are in reality placed in a spiral around the twig, and curve upward to form the appearance of being in two ranks. If one of those leaves is pulled from the twig, it will leave a disk-like mark, but if it is pulled from a spruce, it will leave a horny projection. Fir leaves are also distinguished from those of the spruces by being almost flat instead of square in cross-section.

The native species, with the exception of the White fir, do not thrive in dusty or smoky atmospheres and should not be used except in large extensive developments in rural districts. Most firs are slow-growing trees requiring a cool moist location, but the White fir and Nikko fir can adapt themselves to other conditions.

Nikko Fir

Abies homolepis

This tree was introduced from Japan in 1861, but has not been placed in the trade in great quantities. It is one of the most ornamental of the firs thriving in the mid-western and eastern parts of the United States, and should have much more attention. The Nikko fir is a stately tree, more than 100 feet high, with a broad, pyramidal outline. Its branching system is open, but retained well to the ground, and the foliage is dark and lustrous.

The leaves are different from those of the native firs, as they vary in length and in their upright position to form a sort of mounded outline on the upper side of the twigs. This is called a pectinate, or comb-like arrangement by the botanist. The longest leaves are about an inch long and extend out from the side of the twig in an almost horizontal position, while short ones rise at more acute angles to the upper surface of the twigs to simulate the rounded arch, but leaves a slightly



Fig. 9. The firs have their flat narrow leaves attached to the twig by a disk-like base.

V-shaped depression in the middle similar to that of the other firs. The individual leaves are stiff and have two broad white stripes on their under surface.

The Nikko fir requires a moist, well-drained soil and should be satisfactory for specimen planting under city conditions in the southern portions of Michigan.

White Fir, Colorado Fir

Abies concolor

A large group of seedling specimens of this species will vary in color from an ordinary green to a bright blue-green that can be seen from a great distance. Of these, the ones with bluish foliage have attracted most people, and those specimens are the ones most frequently seen in ornamental plantings. The individual leaves are flat and curve upward to form the two-ranked appearance that is typical of the genus, but they are from 2 to 3 inches long, in contrast with some of the shorter-leaved species.

When young, the White fir is a dense, wide-spreading tree with its lower branches resting on the ground and its crown very symmetrical. As it becomes older it grows more in height than in width and assumes a narrow pyramidal outline with horizontally spread branches (Fig. 10). It will grow 60 or more feet in height and tends to grow rapidly after it becomes established.

The White fir is a stately tree and the bluish forms are striking in appearance. It is used mostly as a specimen, but can also be used for mixing in large evergreen plantings, such as are necessary in large park and estate developments. Care should be taken, however, in the large plantings, not to use too many of the blue forms, because they give too light an effect to the scene and detract from the values of the mass. This is a good fir to grow on porous and well-drained dry soil, especially where there is danger of extensive dry periods, but it makes a much denser tree when planted in moist good soil.

HEMLOCK

Canada Hemlock

Tsuga canadensis

In places sheltered from prevailing winds, the Canada hemlock is a graceful, fine foliaged tree that is admired by all. Under such circum-



Fig. 10. The White fir makes a stately appearance when used as a specimen.

stances, it will grow 60 or more feet high, retain its lower branches, and assume a pleasing informality of outline.

The leaves are narrow, flat and about three-fourths inch long. They have white lines on their under surface and tend to form a flat spray along the twig.



Fig. 11. The very graceful hemlock should be planted in a moist shady place away from the wind.

The Canada hemlock is used primarily at the edges of woodlands, where it will withstand the shade and have the necessary moist soil, or as a specimen in shaded, protected places. If it is planted where the prevailing winds blow, the branches are broken and the tree becomes ragged, ill-shaped and dwarf.

There are several varieties of this tree, but the Sargent Weeping hemlock (var. *pendula*) is the only one that may be obtained from nursery companies. It is a wide-spreading, flat-topped tree, about 5 feet high and 15 feet across when fully grown. Such a variety has no real landscape value on the small home grounds, but many people who possess larger places, like to have the tree for its horticultural interest.

The Carolina hemlock (*Tsuga caroliniana*) is offered by many nurseries and may be used in gardens in southern Michigan, although the Canada hemlock is our native tree. The former resembles the native hemlock in form and general beauty, but differs by having its leaves distributed more irregularly about the twig and seems to be more compact and darker green in color. Some authorities believe the Carolina hemlock to be the most graceful, but that will depend upon the individual specimen.

JUNIPER

Genus Juniperus

Probably no other genus of the evergreen group furnishes so many valuable plants for the ordinary home grounds as does the genus *Juniperus*. These evergreens vary from spreading prostrate plants, through low pyramidal types and bushy forms, to the regular tall tree forms. All are valuable ornamental plants and can generally be used somewhere in the landscape planting. The tall, narrow, columnar forms are used as accent plants, the low, bush forms for foundation plantings and massing, and the prostrate forms in the rock garden or for covering slopes.

The Junipers thrive best in moist soils that are sandy or loamy, but will adapt themselves readily to dry, rocky, and gravelly grounds. They grow best in sunny open positions. About 40 species are distributed through the upper portions of the northern hemisphere and a great number of varieties. Of this number, the majority may be distinguished

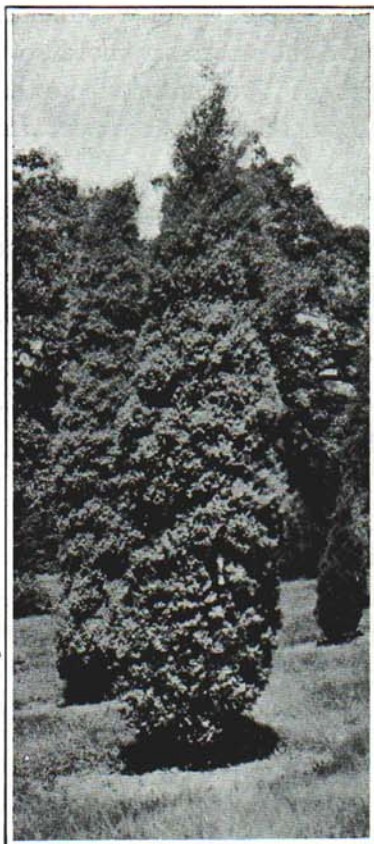


Fig. 12. Conical Chinese juniper.

by their sharp-pointed, triangular-shaped leaves, which have whitish lines, or marks, on their upper surface; and by their small round fruits that are generally dark blue in color with a frosty coating, but may be brown.

Pyramidal Chinese Juniper

Juniperus chinensis

The Chinese juniper is a variable tree and seems to differ according to sex as well as location. The staminate, or male, form appears to be faster growing, taller, and pyramidal in habit while the pistillate, or fruit-bearing, form has a looser crown and will seldom exceed 15 feet in height. This tree is a bushy, irregular type with foliage that is a combination of scale-like and needle-like leaves placed oppositely, or in whorls of three.

For a medium-sized evergreen planting, or at the corners of a house, the Chinese juniper is very satisfactory, for it has dense blue-green foliage and just enough informality to

make it agreeable for large masses, or for grouping with other types of shrubbery. It will grow in a hot, dry place, but grows best in a sunny corner where the soil is moist and well-drained.

Var. *mas* (*J. chinensis* var. *nearboriensis*, var. *mascula*)—CONICAL CHINESE JUNIPER. This is a narrow, conical type of tree (Fig. 12) which will reach 30 feet in height and stay but 3 feet in diameter at the base. Its foliage is very dense, grayish-green, and is retained well to the base. It is a moderately rapid grower, attaining approximately 15 feet in 15 years, and is used for accenting in formal gardens and where there is not much space for a tree.

Another narrow-pyramidal form with bluish-green leaves is *J. chinensis* var. *columaris* which is sold as the BLUE COLUMN CHINESE JUNIPER.

Var. *Pfitzeriana*—PFITZER JUNIPER. This wide-spreading, irregular growing tree has been popular in the past and is a decided addition to many small home properties. Its branches seldom rise more than 4 feet in height, but spread out horizontally until sometimes a diameter of 10 feet is attained. Some nursery companies have been training this plant to grow in an upright manner, so that it forms a bushy informal tree, 10 feet high, with drooping side branches. This form is used in the rear of low evergreen plantings, where a plant of medium height and informal appearance is desired. The natural spreading form is good for simple masses beside steps, for covering slight slopes, for edging down large evergreen plantings, or as an edging to foundation plantings. It is also used on rocky hillsides, or in large rock gardens, to help create naturalistic effects similar to those found in the New England and Michigan pastures, where the Common juniper is found. The Pfitzer juniper resembles the Savin juniper, but has its branches spreading horizontally from the base in an irregular fashion instead of arching in a graceful manner like the Savin juniper. The foliage of the Savin juniper is more scale-like, finer, and has a strong odor when crushed or bruised.

Var. *Pfitzeriana compacta*—COMPACT PFITZER JUNIPER. This plant is much more compact, smaller and has finer foliage. The compact Pfitzer is much superior to the regular Pfitzer juniper for planting about the foundation of small homes.

Var. *Sargenti*—SARGENT JUNIPER. This is a prostrate form with creeping stems and ascending twigs, which combine to form a dense mat 8-10 feet across, and about a foot in height when fully developed. The foliage is bright green at first, but assumes a bluish cast when older. This variety may be used in rock gardens, on banks, or as a large ground cover. It is also used as a low shrub in front of evergreen foundation plantings or similar locations. It does not thrive in the shade.

Common Juniper

Juniperus communis

The Common juniper is variable in its form, but the true type is a broad pyramidal tree 20-30 feet high. The native plant, called the Common juniper, is really the variety *depressa*, or what is called the "Prostrate Juniper" by the nurseryman.

The Common juniper and its varieties are distinguished by the needle-like leaves which are concave on the upper surface, and have a very broad white band down the groove on the upper surface. Since the amateur gardener is more interested in the varieties, the more important ones have been selected for discussion.



Fig. 13. Irish juniper.

Var. *depressa* — OLDFIELD COMMON JUNIPER, PROSTRATE JUNIPER. This geographical variety varies from a very low spreading type with almost prostrate branches to a more upright form with the branches ascending at an acute angle to the ground. It is an informal type of shrub which very rarely rises more than 3 feet from the ground and may be used in the evergreen foundation planting, the large rock garden, or for other mass plantings. It is a native to Michigan and a good evergreen for lending informality to the planting, and also for helping to blend the other forms which have a more definite outline. The chief objection to the Prostrate juniper is its habit of turning brown during the winter.

The Golden Prostrate juniper (*J. communis* var. *aureo-spica*, var. *depressa aurea*) is similar to the foregoing variety, but its new foliage is a brilliant golden color which dulls as the season advances.

Var. *hibernica*—IRISH JUNIPER. (Fig. 13). This is one of the slimmest of the small pyramidal evergreens. The branches are held stiffly erect and very closely pressed to one another, to form an unusual vertical accent among the smaller plants. It will remain dense and attractive until it is about 8 feet high, when the lower foliage begins to die and the plant becomes irregular and unkempt in appearance. Care must be taken to protect the Irish juniper from severe winds and snow. Unless the branches are tied together late in the fall, or the plant is shaken to prevent the snow from becoming lodged in the angles of the branches, the branches are forced down and will break, making an irregular and de-

formed tree. It will stand very dry conditions, but is slow growing in such places and likely to become infested with Red spider.

Var. *hibernica nana*—DWARF IRISH JUNIPER. This form differs from the foregoing variety by being dwarfer and more globular. It is extremely slow growing, has very dense gray-green foliage and may be used in the rock garden, or as a color variation in the low evergreen planting.

Var. *suecica*—SWEDISH JUNIPER. In general outline the Swedish juniper is somewhat like the Irish juniper, but differs in having a more upright columnar outline with the ends of the branchlets drooping slightly, instead of a slender tapering form. In other words, it is a compact tree with side lines almost straight for a distance of 10 to 20 feet, yet its diameter at base or top will be only from 12 to 18 inches. Its foliage is lighter and more bluish in color than that of the Irish juniper. The Swedish juniper is to be preferred over the Irish juniper for large formal effects, but both are likely to be pulled apart by heavy snowstorms and suffer in severe winters.

Creeping Juniper

Juniperus horizontalis

This is one of the outstanding procumbent evergreens and has received much attention with the increase in popularity of the rock garden. The Creeping juniper also makes a very dense, neat appearance when used in large masses for covering sandy banks or rocky slopes. Its long, trailing branches will give a spread of 10 or more feet, and the numerous twigs rise from 1 to 3 feet. The foliage varies from a bluish gray-green to steel-blue and has a slightly aromatic odor when crushed. The Creeping juniper will grow on sandy or loamy soil and withstands exposed conditions well.



Fig. 14. The Creeping juniper can be used in large masses on slight slopes, or in the rock garden.



Fig. 15. Savin juniper.

Var. *Douglasii*—WAUKEGAN JUNIPER, CREEPING JUNIPER. This trailing variety is mentioned because of the color variation of its foliage. During the summer it is a soft blue-green; in the winter, its foliage is turned a pale purple with the cold, but the bluish-white bloom of the leaves makes them appear almost lavender in color. It is used mostly in rock gardens and is a rapid grower.

Savin Juniper

Juniperus sabina

In smoky cities, this is one of the best of the low-growing evergreens, for foundation planting. It is also used on estates for massing beside the terrace steps, on slight slopes, and for edging down large evergreen plantings. The Savin juniper is a graceful plant, with slender arching branches rising 3 feet or more. A comparison between this plant and the common Pfitzer juniper is given under the description of *Juniperus chinensis* var. *pfitzeriana*. A very small boring insect at the base of twigs or branches will often be the reason for the appearance of dead branches. In recent years a blight has been attacking the Savin juniper and in areas where this disease is common, it would be best not to use the Savin juniper. The blight turns one branch after another brown until it dies.

Var. *tamariscifolia*—TAMARIX SAVIN JUNIPER. A geographical form from southern Europe that is usually trailing in habit, although it will rise as high as 3 feet upon occasion. Its dense gray-green foliage is attractive and especially effective when used among rocks. It has an unfortunate tendency to develop dead branches and dead wood from time to time and as a ground cover has been replaced by the Sargent juniper or other semi-prostrate junipers.

Singleseed Juniper

Juniperus squamata

This decumbent juniper is an immigrant from western China. Its spreading branches rest on the ground, but the thick twigs rise toward the tip so that the plant may be two feet or more high. The grayish or bluish-green leaves are crowded upon the twig to such a degree that

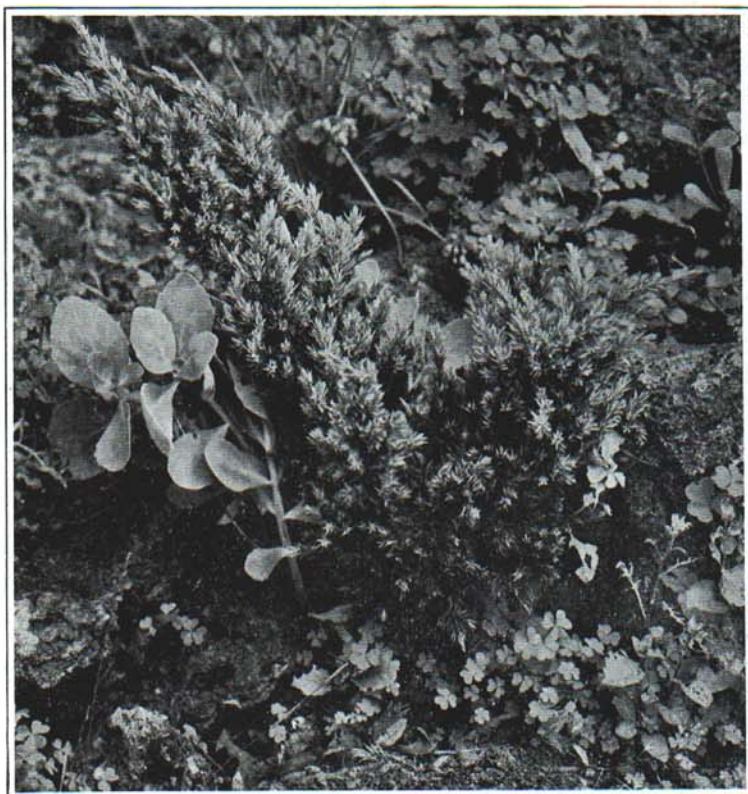


Fig. 16. The Meyer juniper makes an interesting note in the rock garden.

the plant looks heavy and even coarse of texture. It may be used as an edging plant for mass plantings of evergreens or as a ground cover.

Var. *Meyeri*—MEYER JUNIPER. There are a few dwarf, irregular growing evergreens which are used as curious features in the rock garden, and the Meyer juniper is one of the most attractive of them all. It is an upright plant, 4 to 6 feet high, with many branches of varying lengths, which give it an unusual irregular and zigzagged outline. The dense bluish-green foliage has a lustrous sheen that is decidedly different and in the autumn, frequently assumes a pink tone. Its chief value is lending interest to the rockery, or Japanese garden (Fig. 16).



Fig. 17. This twig of the Eastern Redcedar shows the scale-like leaves and bluish-white berries.

Eastern Redcedar

Juniperus virginiana

This slow-growing native tree varies according to its habitat. In Michigan, it is a tall, bushy, pyramidal tree with branches retained to the ground. Its foliage is a dark green color in the summer, but during the winter months has a brownish cast. It is very dense and composed of both needle-like and scale-like leaves (Fig. 17).

The Eastern Redcedar transplants easily and is very resistant to drouth, but should not be planted near an apple orchard or many of the flowering crabs as it is a host for the apple rust. It is desirable in the bird sanctuary for its fruit and as a nesting site. The Redcedar may be used in foundation planting, especially about houses of gray stone, for a windbreak, or trimmed for a high hedge (Fig. 18).



Fig. 18. Redcedar hedge.

There are at least 15 varieties of this native tree offered by nurserymen, and of those the following have been selected as being suitable for general landscape use. They are all adaptable to the sandy or gravelly hillsides, but must be given plenty of sunlight.

Var. *Canaertii* (*J. virginiana* var. *Cannartii*)—CANAERT REDCEDAR, CANNART REDCEDAR. This variety is generally sheared when young to produce a very dense pyramidal outline. Its foliage is very heavy and a deeper richer green than that of the Eastern Redcedar. Eventually, it will reach 15 feet in height, but is rather slow-growing, and can be used in the house foundation planting, for low hedges and other similar uses. It is superior to the Redcedar for small properties and is attractive when covered with its bluish white fruits. If it is not pruned it will form an open, irregularly branched tree of informal character.

Var. *glauca*—SILVER REDCEDAR. As the common name indicates, this variety has silvery blue foliage in the spring which gradually changes to a grayish blue. It is a graceful tree, 15 feet high, and looks well as a color accent among other evergreens. If it is desired, the plant may be made denser by shearing when young, but by so doing the gracefulness of the drooping branches will be lost. It must be planted in a sunny place.

Var. *Kosteri*—KOSTER REDCEDAR. Like the Pfitzer juniper, the Koster Redcedar is a semi-dwarf tree, 2 to 3 feet high, with horizontally spread branches and irregular habit. It is especially good for small gardens, rockeries, or as an informal edging for pools.

Var. *tripartita*—FOUNTAIN REDCEDAR. Like the Meyer juniper the Fountain Redcedar is an unusual and interesting dwarf variety. It is a slow-growing bushy shrub which may reach a height of 4 feet by the age of 15 years. It has an irregular crown of arching branches. The foliage is light bluish-green and has an unusual crimply appearance that would harmonize with the spirit of a Japanese garden.

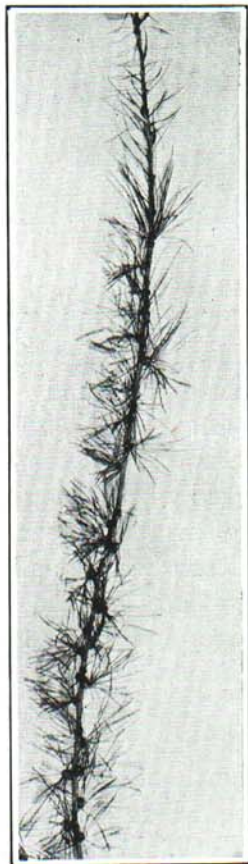


Fig. 19. Most of the slender leaves of the larch are grown on little spurs.

LARCH

Genus Larix

The larch is not a true evergreen, but has needle-like leaves, cones, resinous sap and other characteristics found in the evergreen group. The leaves are flattened and in a spiral arrangement, similar to that of a spruce, but most of them are held on short stubby spurs (Fig. 19), which become very prominent after the foliage has fallen in the autumn. The leaf clusters are not sheathed as those of the pines, which also help one to identify the larches.

Eastern Larch, American Larch, Tamarack

Larix laricina (*L. americana*)

In Michigan many wet places support almost pure stands of the Eastern larch, and for large masses in such locations its foliage gives a pleasing soft green color from a distance, but in the winter such groups are likely to look somewhat barren and dead. It is seldom that the ordinary lawn area is moist enough to support the Eastern larch as a specimen and its main value is in the large open places found in parks and farm lands.

There are few, if any, other American conifers with so small a cone as the Eastern larch. They are oval, or almost round, and vary from one-half to three-quarters of an inch in length, with approximately 12 scales. This character, combined with the leaves, which are about an inch in length, serves to identify the tree.

European Larch

Larix decidua (Larix europaea)

The European larch is a straight pyramidal tree 60 or more feet high whose crown is open, but well-formed. Its foliage is bright green, with the leaves averaging only an inch in length. Ornamentally, the European larch is superior to our native American larch, or tamarack, as it has denser foliage and will grow better under ordinary lawn conditions. It will grow well in light sandy soil. The European larch is used as a specimen tree in park and estate plantings for its lightness in appearance and as a contrast to the other trees. It may also be used in groups in conjunction with evergreen woodland plantings.

Japanese Larch

Larix Kaempferi (L. leptolepis)

Many Japanese plants have been introduced into this country, which have proved to be among our best ornamental specimens. As one of these, the Japanese larch can take its place as one of the most attractive and rapid growing of the larches. It is a broad pyramidal tree, 50 to 60 feet high, with horizontal branches that curve upward near their extremity. The flattened leaves are from a half inch to one and a half inches in length, but are broader and more of a bluish-green color than our native larch. In addition, the leaves have two white lines on their under surface.

This tree thrives in a light moist soil and makes a fine specimen for the lawn area. It should be given a trial by garden lovers in the most southern portions of Michigan.

PINE

Genus Pinus

A pine is easily distinguished from all other evergreen trees found under cultivation in Michigan by its clusters of needle-like leaves (Fig. 20). These leaves will vary in size, color, and habit of growth, according to the species, but there will always be two or more of them bound together at the base by a light brown membraneous sheath.

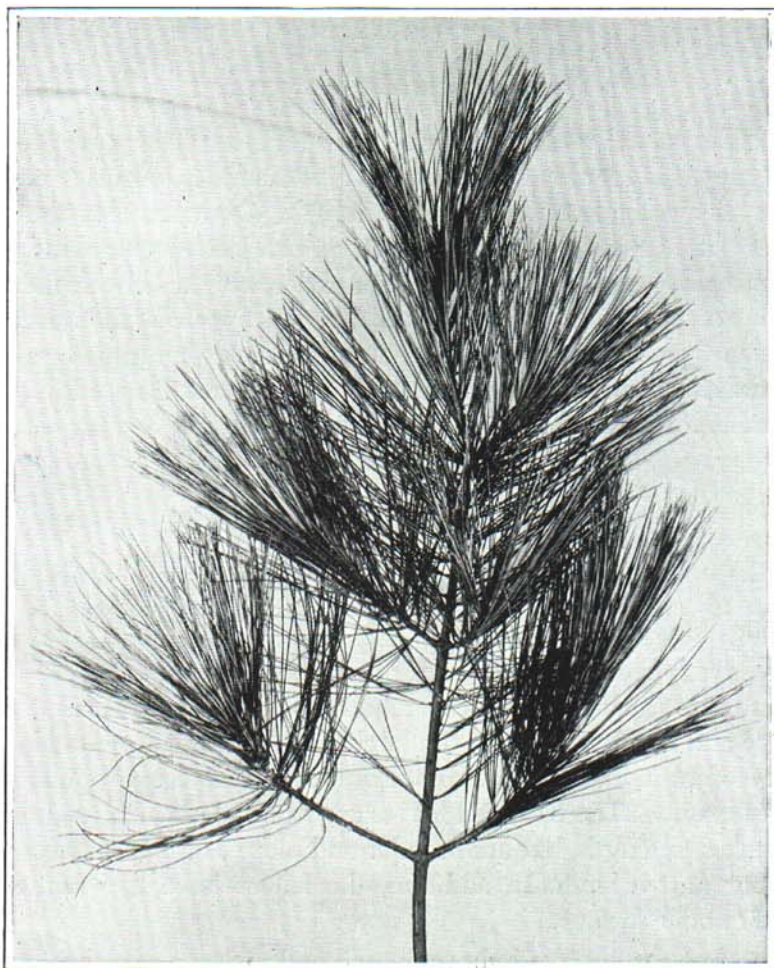


Fig. 20. The pines have their leaves in clusters.

Austrian Pine

Pinus nigra

For many years the Austrian pine has been popularly planted as a specimen on large lawns. It is symmetrical pyramidal tree, 50 or more feet high, with a very heavy, wide-spreading, flat crown. The foliage is an extremely dark green, compact, and gives a massive appearance to the tree. Individually, the leaves are stiff, sharp-pointed, 3-6 inches long, and are held together in pairs by the sheath.

The Austrian pine is hardy, rapid-growing, and withstands exposure

and smoky atmosphere well. It may be used in large, dense mass plantings, and for windbreaks.

The var. *austriaca* is a geographical variety that is identical with the species, so far as landscape planting is concerned.

Japanese Umbrellapine

Pinus densiflora var. *umbraculifera*

This odd pine has several branches rising from a common point near the ground, much in the manner of a shrub, forming a rounded or flat-topped crown, 12 feet high (Fig. 21). The bark on the trunk is orange-red and on the younger twigs orange-yellow. The leaves are in clusters of two, 3 to 4 inches long, bluish-green in color and very flexible. This pine is comparatively slow-growing and may be used in evergreen border plantings of medium height, or as an accent in the formal garden.



Fig. 21. Japanese Umbrellapine.

Swiss Mountain Pine

Pinus mugo (*Pinus montana*)

Like the Japanese Umbrellapine, this pine resembles a shrub-like tree (Fig. 22), but will vary from a low, almost prostrate plant to one 20 or more feet in height. It differs, however, in having much heavier, bright green leaves in clusters of two and dark gray bark on the branches. The Mountain pine is a handsome, well-formed shrub, and well-adapted for specimen planting on the lawn, or rocky slope, and for large formal effects in parks. Because it is so variable in shape there have been many varieties selected to use in small plantings.

Var. *mughus*—MUGHO SWISS MOUNTAIN PINE. This variety is a low, compact plant, suitable for use in foundation plantings and as a small

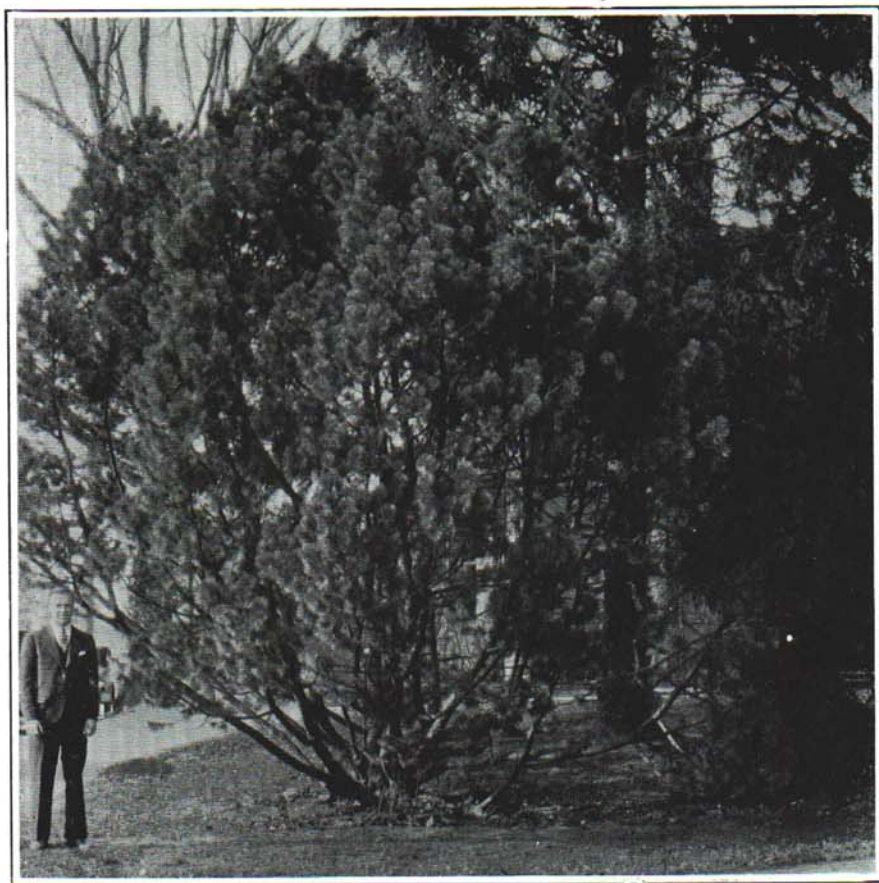


Fig. 22. Swiss Mountain pine.

formal garden accent. The Mugho Swiss Mountain pine grows the same as the species, but is much denser, and grows only about 4 feet in height after many years. It will withstand drouth, shade and the poor atmospheric conditions found in cities. The foliage will not brown during the winter months.

Var. *compacta*. Of recent years, the nurserymen have selected a form of the Mugho pine which seems to be denser and dwarfer, which they have listed under this name. It grows into a low, compact mound, and is used mostly in rock gardens and low foundation plantings.

Var. *rostrata* (*Pinus uncinata*)—TREE SWISS MOUNTAIN PINE, LARGE SWISS PINE. This is a pyramidal form with a single stem, or trunk, like the regular tree forms, which assumes a "beehive" outline when young. In its native habitat, the Pyrenees, the pine is reported to grow 75 feet in height.

Red Pine, Norway Pine

Pinus resinosa

The Red pine, in general habit, is similar to the Austrian pine, but differs in having reddish bark on the trunk and more flexible needles. It is also a dark massive tree that grows rapidly, and gives a rugged expression to the landscape planting. The Red pine is one of the best of the pines for the Great Lakes region, or similar sandy places, for planting as a specimen on exposed lake fronts, in the park, or on the large lawn. It is also good for windbreak plantings and reclaiming waste land to timber.

The Red pine does best on a sandy loam, but will grow in clay if not too heavy. It is one of the best of the pines for withstanding drouth and should be given an open position.

Swiss Stone Pine

Pinus cembra

This very slow-growing pine is exceptionally narrow in form and useful in restricted areas where height, but not breadth, and the effect of a small pine is desired. It may also be used in the rear of low shrubbery, or foundation plantings, if it will be removed before its form is destroyed by the crowding of faster growing plants.

For many years the Swiss Stone pine has a narrow symmetrical pyramidal crown, with its lower branches held to the ground, but as it reaches maturity its crown will broaden and become more open. It is

long-lived and will attain a height of 70 or more feet. The foliage is dark green and the needles are in clusters of five, the same as the White pine, but are heavier and darker in color than the latter. It prefers a moist rich soil, but will adapt itself readily to exposure, shade and the less fertile soils.



Fig. 23. The White pine assumes a picturesque outline when fully grown.

Eastern White Pine

Pinus strobus

No other pine can duplicate the beautiful, soft, and graceful effect given by the Eastern White pine, when planted in a grove. The soft bluish-green foliage has an unusually fine textural effect for an evergreen, and its lightness of color makes a wonderful contrast with other evergreens. Individually, the flexible leaves are 3 to 5 inches long, gathered in clusters of five, and are very slender.

The Eastern White Pine will grow to 75 or more feet in height, and as it nears maturity loses its pyramidal outline, but a more open and often picturesque beauty replaces the graceful form of youth (Fig. 23). It is when the irregularities of the aged specimen are seen in silhouette that its picturesqueness and lasting beauty are most impressive. The White pine cannot be used as a specimen, but must be planted with other trees and preferably in large groups of its own kind. It makes an excellent screen for windbreak planting, and if pruned once or twice a year, will form a dense billowy hedge, 4 feet high and 4 feet across (Fig. 24). No one can imagine the charm of a White pine hedge, until



Photo: Frank A. Waugh.

Fig. 24. The White pine will form a splendid hedge if young trees are planted 2 feet apart. This hedge is 10 years old.

he has seen it, for the dense, light green foliage gives a beauty that is soft and without a trace of stiffness. It is entirely different from any other kind of hedge.

Scots Pine, Scotch Pine

Pinus sylvestris

The Scotch pine is distinguished from the other pines by its bright orange-brown upper branches, which are easily seen through the open, rounded crown. It is a variable tree in its habit of growth, but is usually pyramidal when young, round-headed when older, and open in its branching system at all times. It is a rapid grower, extremely hardy, and attains a height of 60 or more feet. The bluish-green leaves are in clusters of two, 2 to 3 inches long and twisted. Because of the openness of the head the foliage appears sparse, which forbids the tree's use as a specimen, but makes it desirable for mass plantings, where the orange bark appears as a highly ornamental feature. On the prairies it may be used for windbreaks, or for covering waste land, and is also good in dry sandy soil where the White and Red pines will not live.

Umbrellapine

Sciadopitys verticillata

This native of Japan is entirely different from the ordinary evergreens found in the majority of gardens. It has a typical pyramidal shape that is extremely dense, but appears different, even at the first glance, because of its foliage. There are actually two different types of leaves on the tree, but the ones that are noticed and give the distinctive appearance are crowded in whorls of 20 to 30 leaves at the end of each twig. Individually, these leaves are flat, 3 to 6 inches long, and grooved on both sides so deeply as to be almost divided into two parts. They are also very dark green and glossy above, with two white bands beneath, and extremely stiff. These leaves make the foliage appear like a solid mass of dark green, broken into prominent radiating lines, which is decidedly unusual and interesting.

The Umbrellapine is very slow-growing and may be considered as a small accent tree, even if it is reputed to grow more than 100 feet high. It demands a deep, moist, but well-drained soil, and half shade. Its hardiness is doubtful, although it will grow along the Atlantic seaboard as far north as Boston. Only those gardeners living in the southern portion of Michigan should try the Umbrellapine and then only in a protected place.

SPRUCE

Genus Picea

The spruce may be distinguished from other pyramidal evergreens by having four-angled and sharply pointed needles arranged in a spiral fashion down the twig (Fig. 24). There are white lines on all four sides of the needles, and when the leaves drop they leave a woody, or horny, projection on the twig.

The spruces are easy to transplant and the larger forms are used in parks and on large estates as specimens or in clumps. On the farm they



Fig. 25. The leaves of a spruce are four-angled, sharp-pointed and leave a horny projection on the twig when they fall.

are used for windbreaks and shelter plantings. Many dwarf varieties are among the spruces, which are used mostly in formal and rock gardens or as curiosities in a large general collection of evergreens, such as would be found in an arboretum. As a rule, spruce trees are not suitable for planting in cities or manufacturing towns, as they are unable to withstand smoky atmospheres or drouth.

Colorado Spruce

Picea pungens

Like many other spruces, the seedlings of this tree will vary considerably in their foliage color. The more blue forms are generally separated and given the name of Blue Colorado spruce, while the green and slightly blue forms are sold as the regular Colorado spruce. Even the green forms, however, are striking in appearance, due to their perfect pyramidal outline and horizontally spread branches that are in such close whorls that they give a decided layering effect to the tree. This characteristic branching, plus the very rigid, sharp-pointed needles, makes the tree easy to identify.

The Colorado spruce is especially dense and beautiful when young, but after becoming approximately 30 years of age, it begins to lose its lower branches. It is planted as a specimen, or in groups, to emphasize the dense horizontal habit of branching, and is one of the best of the spruces for dry climates and for planting in cities.

Var. *glauca*—BLUE COLORADO SPRUCE. The seedlings which have a decided blue color are separated and given this name.

Var. *argentea* (*P. pungens* var. *Kosteri*)—KOSTER BLUE SPRUCE. This is a grafted form with steel-blue foliage that is always the same color. For those planning definite color schemes which demand this type of tree, the Koster Blue spruce should always be used.

Var. *viridis*—GREEN COLORADO SPRUCE. The Green Colorado spruce is a green form of the species.

Engelmann Spruce

Picea Engelmanni

Many persons like bright blue-foliaged trees, but cannot afford the expensive Blue Colorado spruce, or the Koster Blue spruce. For those people, many nurserymen have been substituting the Engelmann

spruce. It is a narrow, pyramidal tree, with a compact symmetrical outline and drooping twigs that relieve the stiffness of the main branches. The foliage color will vary among seedlings, from an ordinary green to a steel-blue that will rival the Blue Colorado spruce, especially in the spring. Botanically, the leaves are one-half to an inch long, sharp-pointed, but not so rigid as those of *Picea pungens*, and point forward toward the end of the twig. They also have a strong aromatic odor when bruised.

When young, the Engelmann spruce has a dense habit, but after it becomes approximately 35 years of age, the lower branches begin to fall, and it becomes more open. It is reputed to grow more than 100 feet in height, but for landscape purposes, is used only as a temporary substitute for the better blue-colored spruces.

Norway Spruce

Picea Abies (*P. excelsa*)

The general outline of the Norway spruce resembles that of the native White spruce, but it can be easily distinguished by the pendant whip-like branchlets that wave in the wind and give a pleasing gracefulness to the tree. It will grow from 70 to 150 feet in height, but begins to get ragged in the upper portion of the crown long before it reaches full maturity (Fig. 26).

In moderately moist soil, the Norway spruce is one of the most graceful of all the large evergreen trees. It may be used for wind-breaks, specimen planting, and even for hedges, 6 or more feet in height. For hedge purposes, small-sized trees should be planted 2½ feet apart.

There are many varieties of this tree which are valuable for all sizes of rock gardens and terrace developments, but space will not permit a full list of them. The better varieties for the average home owners are listed as follows:

Var. *conica*—ARROWHEAD NORWAY SPRUCE. This variety is a symmetrical compact, conical tree with ascending branches and slender branchlets that may be used as a special accent in the small formal garden. The radially arranged leaves are thin, sharp pointed, and light green. It is very slow-growing.

Var. *Gregoryana*—GREGORY NORWAY SPRUCE. A low, flat, bush-like tree with a mass of short branches, and slender grayish-yellow branch-



Fig. 26. The Norway spruce makes a fine silhouette against the sky.

lets that is particularly fitted for use in the rock garden. The short, stiff leaves spread obliquely from all sides of the twigs and give a dense foliage effect. The tree is so slow-growing that it is hardly possible to see it increase in size and when 35 years old is seldom more than 20 inches in height.



Fig. 27. The Maxwell spruce is one of the finest of the dwarf spruces for rock garden plantings.

Var. *Maxwellii*—MAXWELL NORWAY SPRUCE (Fig. 27). When young this spruce is a very low, flat cushion, approximately four times as broad as high, but gradually becoming higher with age, although the rounded outline is retained. At the age of 15 years, or more, it will be only twice, or three times as broad as it is high. The annual growth is about an inch, or less, and 15-year-old specimens are approximately 1½ feet high and 2½ feet across. A specimen in Highland Park at Rochester, N. Y., is 6 feet across and 2½ feet high. The older foliage is dark green and composed of stiff, closely placed leaves; the new light green leaves are radially arranged, one-half of an inch, or less, in length, flexible, and very narrow, being drawn to a long tapering point. The entire foliage mass gives a fine textured effect and is impenetrable. The Maxwell Norway spruce will make an unusual, desirable specimen for the rock garden and is probably one of the best of the dwarf spruces for such a place.

Var. *pygmaea*—PYGMY NORWAY SPRUCE. It is a semi-conical dwarf, about 2 feet high, with very slender grayish-white, or grayish-yellow branchlets and short branches. The bright green leaves are radially arranged, very small, prickly and close-set.

Var. *Remontii*—REMONT SPRUCE. This ovoid, or broadly conical tree is almost as broad as it is high and very slow-growing, but will, in time,

attain a height of 3 feet. Its crowded yellow-barked branchlets are covered with thin, soft leaves, less than one-half inch in length, that are spread radially, yellow-green in color and taper from the middle to a slender point.

Serbian Spruce

Picea omorika

This native tree of southeastern Europe was introduced about 1880, but has not become well known as yet, because of the slowness of the horticulturist in advertising its merits. It is a desirable spruce with attractive foliage, graceful drooping twigs, and slow growth. It should prove to be a handsome small tree for home grounds in the lower peninsula if it is not planted in a windswept area.

The Serbian spruce differs primarily in its foliage. The leaves are broad and flattened, not square as are those of the native spruce, one-half to three-quarters inch long, and have two distinct white bands on their upper surface. They are lustrous dark green on the underside. The foliage is very dense and attractive.

In a well-drained, moist, rich soil, this tree should make a good specimen, and will attain a height of approximately 20 feet in 45 years. It has a narrow-pyramidal outline.

White Spruce

Picea glauca (*P. canadensis*)

For general landscape planting, the native White spruce is one of the finest and most vigorous of all the large spruces. It is a spiry-topped, or conical, tree, 50 to 90 feet high, and forms a beautiful silhouette against the sky, when used as a specimen. It has good compact foliage and the low wide-spreading branches hug close to the ground for many years.

The White spruce will grow in almost any type of soil, but looks its best in a cool, moist place. It is symmetrical, but not so graceful as the Norway spruce. On the farm it is prized highly for windbreaks and screen plantings, and on the large estate it is frequently used for large hedges. If a hedge is desired, it is best to use plants about 3 years old, and place them 18 inches apart, so as to have a good dense growth near the bottom.



Fig. 28. An old specimen of the Dwarf Alberta spruce.

Var. *albertiana* (*P. albertiana*)—ALBERTA WHITE SPRUCE, BLACK HILLS SPRUCE. A tree called the Alberta White spruce has become popular recently as a specimen evergreen for a medium-sized lawn, or as a background to the small border planting. The true variety is a compara-

tively narrow pyramidal tree, reputed to grow more than 100 feet in height, but it seems to have been confused in the trade with a tree described by Liberty Hyde Bailey as *P. glauca* var. *densata*. This tree is very hardy and so slow-growing that it will stay below 40 feet in height for many years. It is compact and bushy with foliage that varies from green to blue-green. It is a desirable tree for severe climates.

Var. *conica* (*P. canadensis* var. *albertiana conica*)—DWARF ALBERTA WHITE SPRUCE (Fig. 28). From owners of large rock gardens, the Dwarf Alberta White spruce should receive some consideration, as it differs radically from the ordinary spruce trees. It is an extremely narrow conical tree with closely set, short, flexible twigs, which present a solid unbroken surface of foliage. The foliage is a soft grass-green and composed of very fine, slender leaves that are a half inch in length, very flexible, and spread radially from the twig. The Dwarf Alberta White spruce is an exceedingly slow-growing tree, being only 2½ feet high, or less, when 10 years old. It is excellent for permanent low plantings in the rock garden, or for small formal effects on the terrace, and does best in a partially shaded, moist location. It should be screened on the south side during the winter to prevent sun-scalding.

Japanese Yew

Taxus cuspidata

When the Japanese yew is grown from seed, it is an upright tree, 30 to 50 feet high, but if it is reproduced by cuttings, it usually forms a wide-spreading, slow-growing shrub (Fig. 29). The latter is the ordinary type received from the nursery company.

The foliage is a dark, dull green, except in the early spring, when the new foliage appears as a showy yellow-green. The leaves are approximately 1 inch long, about one-eighth inch wide, and arranged along the twig to form a V-shaped trough. The lower surface of the leaves has two broad yellow bands.

The spreading form of Japanese yew is a valuable plant for evergreen foundation planting, as it takes approximately 30 years to grow 10 feet in height and has a pleasing informality that lends itself well for group planting. It is also valuable as a hedge plant. It grows in a light soil, sunny or shady locations, which makes it available for planting on the north side of buildings. It will withstand the smoky at-



Fig. 29. The Japanese yew is excellent for low plantings in shady places and on the north side of buildings.

mosphere of the city and is green all the year round. It would be wise to protect these plants in late winter, from prevailing winds and the sun on the south side because the twigs dry quickly at that time of year.

Var. *aurescens*—GOLDTIP JAPANESE YEW. This is a spreading form of the species whose new growth in the spring is a golden-yellow tinged with green. It is very showy and may be used as a color accent.

Var. *capitata*—UPRIGHT JAPANESE YEW. This variety is an upright pyramidal form which can be made very regular and formal by shearing. It is useful for hedge planting and for formal gardens. This is really the typical upright form of the species.

Var. *nana* (var. *brevifolia*)—DWARF JAPANESE YEW. This is a spreading, much branched form, which is neat and compact when young, but becomes irregular in outline when old.

It will grow ultimately to 4 feet in height and 6 or more feet in width. The foliage is very dark green and more densely distributed along the twig than on the species. It is splendid for foundation plants.



Fig. 30. Hybrid yews, like this Hicks yew, should receive more attention.

Horticultural Varieties of *Taxus*

The Japanese yew and English yew have been crossed to form a hybrid variety that has darker and denser foliage, and leaves that are more distinctly two ranked. This hybrid is frequently called *Taxus media*, and grows as an upright pyramidal tree. It will be approximately 4½ feet high in 10 years.

Various forms of this cross have been segregated and given varietal names. The most outstanding is the Hicks yew (*Taxus media* var. *Hicksii*), which has an upright conical form (Fig. 30). It is about 5½ feet high

when 11 years old and is used as an accent plant in the formal garden or in the foundation planting.

The Hatfield yew (*T. media* var. *Hatfeldii*) is another hybrid with a compact columnar or pyramidal outline that is extremely slow-growing. It may be used in rock gardens, or in other low plantings.

TREES FOR SPECIAL PURPOSES

SPECIMENS FOR FOUNDATION PLANTING

American Globe Arbor-vitae—*Thuja occidentalis globosa*
 Douglas Pyramidal Arbor-vitae—*Thuja occidentalis Douglasii pyramidalis*
 Ellwanger Arbor-vitae—*Thuja occidentalis Ellwangeriana*
 Redcedar—*Juniperus virginiana*
 Cannart Redcedar—*Juniperus virginiana Canaertii*
 Silver Redcedar—*Juniperus virginiana glauca*
 Chinese Juniper—*Juniperus chinensis*
 Irish Juniper—*Juniperus communis hibernica*
 Compact Pfitzer Juniper—*Juniperus chinensis Pfitzeriana compacta*
 Prostrate Juniper—*Juniperus communis depressa*
 Mugho Pine—*Pinus mugo mughus*
 Dwarf Japanese Yew—*Taxus cuspidata nana*
 Hybrid Yews

ROCK GARDENS

Fountain Redcedar—*Juniperus virginiana tripartita*
 Koster Redcedar—*Juniperus virginiana Kosteri*
 Creeping Juniper—*Juniperus horizontalis*
 Meyer Juniper—*Juniperus squamata Meyeri*
 Prostrate Juniper—*Juniperus communis depressa*
 Sargent Juniper—*Juniperus chinensis Sargentii*
 Tamarix Savin—*Juniperus Sabina tamariscifolia*
 Dwarf Alberta White Spruce—*Picea glauca conica*
 Maxwell Norway Spruce—*Picea Abies Maxwellii*
 Remont Norway Spruce—*Picea Abies Remontii*

FOR FORMAL ACCENTS

American Globe Arbor-vitae—*Thuja occidentalis globosa*
 American Pyramidal Arbor-vitae—*Thuja occidentalis fastigiata*
 Douglas Pyramidal Arbor-vitae—*Thuja occidentalis Douglasii pyramidalis*
 Conical Chinese Juniper—*Juniperus chinensis mas*
 ————— *Juniperus chinensis pyramidalis*
 Irish Juniper—*Juniperus communis hibernica*
 Swedish Juniper—*Juniperus communis suecica*
 Mugho Pine—*Pinus mugo mughus*
 Japanese Umbrellapine—*Pinus densiflora umbraculifera*
 Dwarf Alberta White Spruce—*Picea glauca conica*
 Koster Blue Spruce—*Picea pungens argentea*
 Arrowhead Norway Spruce—*Picea Abies conica*
 Upright Japanese Yew—*Taxus cuspidata capitata*
 Hybrid Yews

FOR A GROUND COVER

Creeping Juniper—*Juniperus horizontalis*
 Sargent Juniper—*Juniperus chinensis Sargentii*
 Tamarix Savin—*Juniperus Sabina tamariscifolia*
 Waukegan Juniper—*Juniperus horizontalis Douglasii*

FOR SPECIMEN PLANTING

American Arbor-vitae—*Thuja occidentalis*
 Douglas Fir—*Pseudotsuga taxifolia*
 Nikko Fir—*Abies homolepis*
 White Fir—*Abies concolor*
 European Larch—*Larix decidua*
 Japanese Larch—*Larix Kaempferi*
 Austrian Pine—*Pinus nigra*
 Red Pine—*Pinus resinosa*
 Swiss Stone Pine—*Pinus Cembra*
 Alberta Spruce—*Picea glauca albertiana*
 Colorado Spruce—*Picea pungens*
 Norway Spruce—*Picea Abies*
 Serbian Spruce—*Picea omorika*
 White Spruce—*Picea glauca*

FOR WINDBREAKS

American Arbor-vitae—*Thuja occidentalis*
 Redcedar—*Juniperus virginiana*
 Douglas Fir—*Pseudotsuga taxifolia*
 Red Pine—*Pinus resinosa*
 Scots Pine—*Pinus sylvestris*
 White Pine—*Pinus strobus*
 Norway Spruce—*Picea Abies*
 White Spruce—*Picea Glauca*

FOR HIGH HEDGES

American Arbor-vitae—*Thuja occidentalis*
 Redcedar—*Juniperus virginiana*
 Douglas Fir—*Pseudotsuga taxifolia*
 Canada Hemlock—*Tsuga canadensis*
 White Pine—*Pinus strobus*
 Norway Spruce—*Picea Abies*
 White Spruce—*Picea glauca*

FOR MEDIUM HEDGES

American Pyramidal Arbor-vitae—*Thuja occidentalis fastigiata*
 Cannart Redcedar—*Juniperus virginiana Canaertii*
 Upright Japanese Yew—*Taxus cuspidata capitata*
 White Pine—*Pinus strobus*

FOR LOW HEDGES

American Globe Arbor-vitae—*Thuja occidentalis globosa*
 Dwarf Japanese Yew—*Taxus cuspidata nana*

INDEX

NAME	PAGE	NAME	PAGE
<i>Abies</i>	20	<i>Juniperus</i> —Cont'd	
<i>concolor</i>	22	<i>chinensis nearboriensis</i>	26
<i>homolepis</i>	21	<i>chinensis pyramidalis</i>	26
<i>Arbor-vitae</i>	14	<i>chinensis Pfitzeriana</i>	27
American	14	<i>chinensis pfitzeriana compacta</i>	27
American Globe	16	<i>chinensis Sargentii</i>	27
American Pyramidal	15	<i>communis</i>	27
Douglas Golden	15	<i>communis aureo-spica</i>	28
Douglas Pyramidal	15	<i>communis depressa</i>	28
Eastern Ellwanger	15	<i>communis depressa aurea</i>	28
George Peabody	16	<i>communis hibernica</i>	28
Green Globe	17	<i>communis hibernica nana</i>	29
"Little Gem"	17	<i>communis sabina</i>	30
Oriental	17	<i>communis suecica</i>	29
Pyramidal Eastern	15	<i>horizontalis</i>	29
Reid	17	<i>horizontalis Douglasii</i>	30
Siberian	17	<i>sabina</i>	30
Tom Thumb	16	<i>sabina tamariscifolia</i>	31
Vervaeene	17	<i>squamata</i>	31
Ware	17	<i>squamata Meyeri</i>	32
<i>Fir</i>	18	<i>virginiana</i>	32
Colorado	22	<i>virginiana Canaertii</i>	33
Douglas	18	<i>virginiana Cannartii</i>	33
Nikko	21	<i>virginiana glauca</i>	33
White	22	<i>virginiana Kosteri</i>	33
<i>Hemlock</i>	22	<i>virginiana tripartita</i>	34
Canada	22	<i>Larch</i>	34
Carolina	25	American	34
Sargent Weeping	25	Eastern	34
<i>Juniper</i>	25	European	35
Blue Column Chinese	26	Japanese	35
Chinese	26	<i>Larix</i>	34
Compact Pfitzer	27	<i>americana</i>	34
Common	27	<i>decidua</i>	35
Conical Chinese	26	<i>europaea</i>	35
Creeping	29	<i>Kaempferi</i>	35
Dwarf Irish	29	<i>laricina</i>	34
Golden Prostrate	28	<i>leptolepis</i>	33-35
Irish	28	<i>Picea</i>	43
Meyer	32	<i>Abies</i>	45
Oldfield Common	28	<i>Abies conica</i>	45
Pfitzer	27	<i>Abies Gregoryana</i>	45
Prostrate	28	<i>Abies Maxwellii</i>	47
Sargent	27	<i>Abies pygmaea</i>	47
Savin	30	<i>Abies Remontii</i>	47
Singleseed	31	<i>albertiana</i>	49
Swedish	29	<i>canadensis</i>	48-50
Tamarix Savin	31	<i>canadensis albertiana</i>	49
Waukegan	30	<i>canadensis albertiana conica</i>	50
<i>Juniperus</i>	25	<i>excelsa</i> (See <i>Picea abies</i>)	39-45
<i>chinensis</i>	26	<i>Engelmanni</i>	44
<i>chinensis columnaris</i>	26	<i>glauca</i>	48
<i>chinensis mas</i>	26	<i>glauca albertiana</i>	49
<i>chinensis mascula</i>	26	<i>glauca conica</i>	50

NAME	PAGE	NAME	PAGE
<i>Picea</i> —Cont'd		Spruce—Cont'd	
<i>glauca densata</i>	50	Colorado	44
<i>omorika</i>	48	Dwarf Alberta White	50
<i>pungens</i>	44	Engelmanni	44
<i>pungens argentea</i>	44	Green Colorado	44
<i>pungens glauca</i>	44	Gregory Norway	45
<i>pungens Kosteri</i>	44	Koster Blue	44
<i>pungens viridis</i>	44	Maxwell Norway	47
Pine	35	Norway	45
Austrian	36	Pygmy Norway	47
Eastern White	41	Remont Norway	47
Japanese Umbrella	37	Serbian	48
Large Swiss	39	White	48
Mugho	38	<i>sciadopitys verticillata</i>	42
Norway	39	Tamarack	34
Red	39	<i>Taxus cuspidata</i>	50
Scotch	42	<i>Taxus cuspidata aurescens</i>	51
Swiss Mountain	38	<i>Taxus cuspidata brevifolia</i>	51
Swiss Stone	39	<i>Taxus cuspidata capitata</i>	51
Tree Swiss Mountain	39	<i>Taxus cuspidata nana</i>	51
Umbrella	42	<i>Taxus media</i>	52
White	41	<i>Taxus media Hatfieldii</i>	52
<i>Pinus</i>	35	<i>Taxus media Hicksii</i>	52
<i>cembra</i>	39	<i>Thuja occidentalis</i>	14
<i>densiflora</i>	37	<i>Thuja occidentalis Douglasii aurea</i>	15
<i>densiflora unbraculifera</i>	37	<i>Thuja occidentalis Douglasii pyramidalis</i>	15
<i>montana</i>	38	<i>Thuja occidentalis elegantissima</i>	16
<i>mugo</i>	38	<i>Thuja occidentalis Ellwangeriana</i>	15
<i>mugo mughus</i>	38	<i>Thuja occidentalis fastigiata</i>	15
<i>mugo compacta</i>	39	<i>Thuja occidentalis globosa</i>	16
<i>mugo rostrata</i>	39	<i>Thuja occidentalis lutea</i>	16
<i>nigra</i>	36	<i>Thuja occidentalis pumila</i>	17
<i>nigra austriaca</i>	37	<i>Thuja occidentalis pyramidalis</i>	15
<i>resinosa</i>	39	<i>Thuja occidentalis Reidii</i>	17
<i>strobis</i>	41	<i>Thuja occidentalis robusta</i>	17
<i>sylvestris</i>	42	<i>Thuja occidentalis stricta</i>	15
<i>uncinata</i>	39	<i>Thuja occidentalis Vervaeneana</i>	17
Planting and care of evergreens	10	<i>Thuja occidentalis Wareana</i>	17
Pruning of evergreens	12	<i>Thuja orientalis</i>	17
<i>Pseudotsuga Douglasii</i>	18	<i>Tsuga canadensis</i>	22
<i>Pseudotsuga taxifolia</i>	18	<i>Tsuga canadensis pendula</i>	25
Redcedar	32	<i>Tsuga caroliniana</i>	25
Canaert	33	White Cedar	14
Cannart	33	Yew:	
Eastern	32	Dwarf Japanese	51
Fountain	34	English	52
Koster	33	Goldtip Japanese	51
Silver	33	Hatfield	52
Spruce	43	Hicks	52
Alberta White	49	Japanese	50
Arrowhead Norway	45	Upright Japanese	51
Black Hills	49		
Blue Colorado	44		

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