DAVIDSONIA

VOLUME 2 NUMBER 4 *Winter 1971*

Cover

Forest grove of 'Western red cedar', *Thuja plicata.*
An ink sketch by Mrs. Lesley Bohm

DAVIDSONIA

VOLUME 2 NUMBER 4 *Winter 1971*

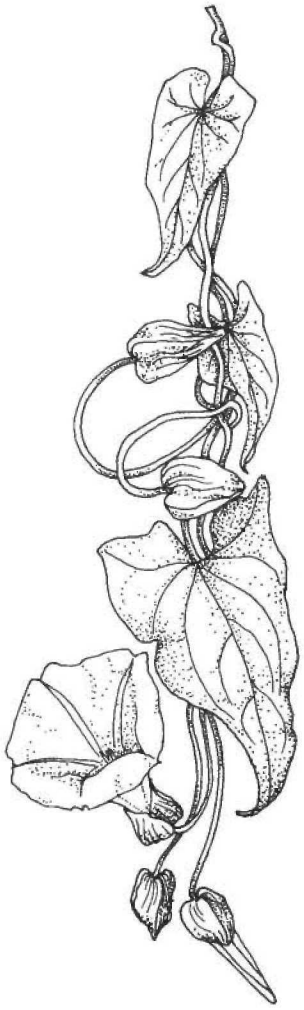
Davidsonia is published quarterly by The Botanical Garden of The University of British Columbia, Vancouver 8, British Columbia, Canada. Annual subscription, four dollars. Single numbers, one dollar. All editorial matters or information concerning subscriptions should be addressed to the Director of the Botanical Garden.

Acknowledgements

The pen and ink illustrations are by Mrs. Lesley Bohm. Dr. C.J. Marchant contributed the photographic material.

Vines and Climbers at UBC

JOHN W. NEILL



Calystegia sepium
The common twining convolvulus

"Ivy-clad halls of learning". This is the picture most people seem to have of the University. It was certainly true of the traditional European institutions and the early colleges of eastern North America. The University of British Columbia, however, is representative of many of the newer schools of higher learning not bound by tradition. The campus is dominated by buildings constructed since the second world war. Their architecture is intended to reflect the trends of the decade in which they were designed. Vines might seem to be out of place, although some critics might wish to see them used to mask some of the architecture which does not appeal to them. There is little room, though, for negative thinking in design and it is better to suggest that the skilful use of vines, climbers and selected wall plants will enhance the architecture and help give us a sense of unity to the total campus.

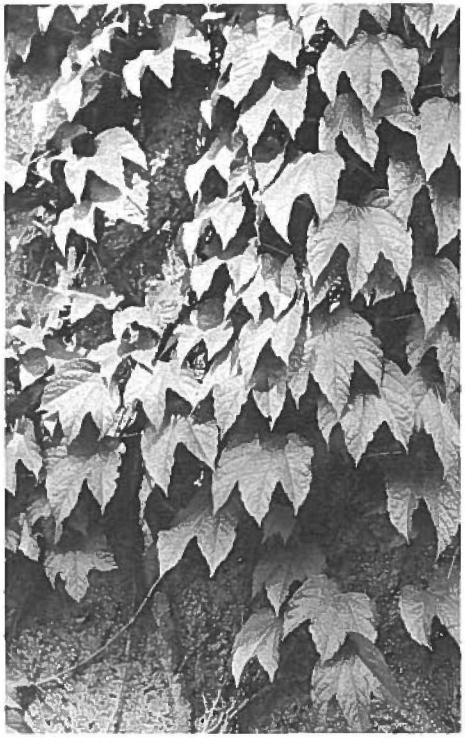
The early depression years of the Thirties saw the construction of a number of temporary buildings to provide the University with inexpensive facilities for administration, the faculties of agriculture, arts, applied science and forestry and an auditorium. These substantial frame stucco buildings have become semi-permanent, since they all are still in use. Most of them were planted with Virginia Creeper, *Parthenocissus quinquefolia* and Boston ivy, *P. tricuspidata*. In spite of the usual recommendation to avoid tight clinging vines on a stucco surface, these do not appear to have noticeably damaged the stucco over the years. The principal maintenance problem has been to keep them trimmed from the windows and eaves. Several times walls have been stripped down and the vines cut back hard for building alterations, following which the rejuvenated climbers have reached the top again within two or three growing seasons.

Other climbers were planted on either side of the main entrances to several of these buildings and are still there. Two of the twining type, needing some support, are Dutchmans-pipe, *Aristolochia durior* and Wisteria, *Wisteria sinensis*. The former, with its huge leaves and fascinating pipe-shaped flowers, adds an exotic touch; Wisteria, with its long chains of mauve flowers in May spreads the scent of a field of clover throughout the buildings.

At the entrance of the Women's Gymnasium – gone now, replaced by a high-rise office tower – there used to be a Trumpetcreeper, *Campsis radicans*. This vine seldom bloomed profusely, obviously requiring more heat than is afforded by the West Coast summers. The bright orange trumpets did, however, provide a bit of colour to a rather drab building.

Gone too are the actinidias, *Actinidia chinensis*, which used to grace the entrance of the Horticulture-greenhouse complex. Growing here at its limit of hardiness, it did not bloom or set the edible "gooseberry" fruit. It was more likely a casualty of a severe winter than of construction. It is recalled for its huge leaves and colourful new growth.

More recently another deciduous creeper has made its appearance on campus. This is the climbing hydrangea, *Hydrangea anomala* var. *petiolaris*. It was first planted on the west wall of the Home Management House where it is equally attractive in early summer, with its white blooms, as in winter when its tightly clinging framework of branches makes a delightful pattern on any permanent wall. Newer plantings at the Faculty Club seem slow to get established, but this is to be expected with the climbing hydrangea which seems to need a year or two of adjustment before "taking off".

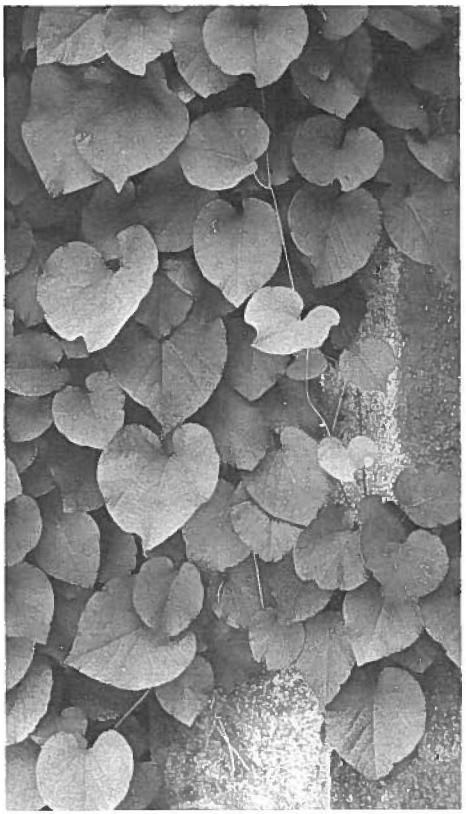


Parthenocissus tricuspidata, the Boston ivy, on the west wall of the Mathematics building

Rapid growing vines are seldom used in permanent plantings. The Silver Fleece-vine, *Polygonum aubertii*, is, however, represented on campus. It is most vigorous and must be kept under control. There was evidence of this last summer when it started to take over a nearby Japanese Maple.

Clematis, although well suited to West Coast conditions, has not been planted extensively on the University campus. One large planter near the Music Building has been filled with *Clematis montana* var. *rubens*, the Pink Anemone Clematis. This has draped over the planter wall, making a great show in late May. Other clematis, *C.* X *jackmanii* cultivars and the evergreen *C. armandii* have been confined to a nursery location, growing on the lath houses covering some of the Rhododendron collection.

A wide range of deciduous climbers has always been offered by the West Coast nurseries. It is interesting to note, however, the development of a new nursery operation in this area specializing in clematis. This surely



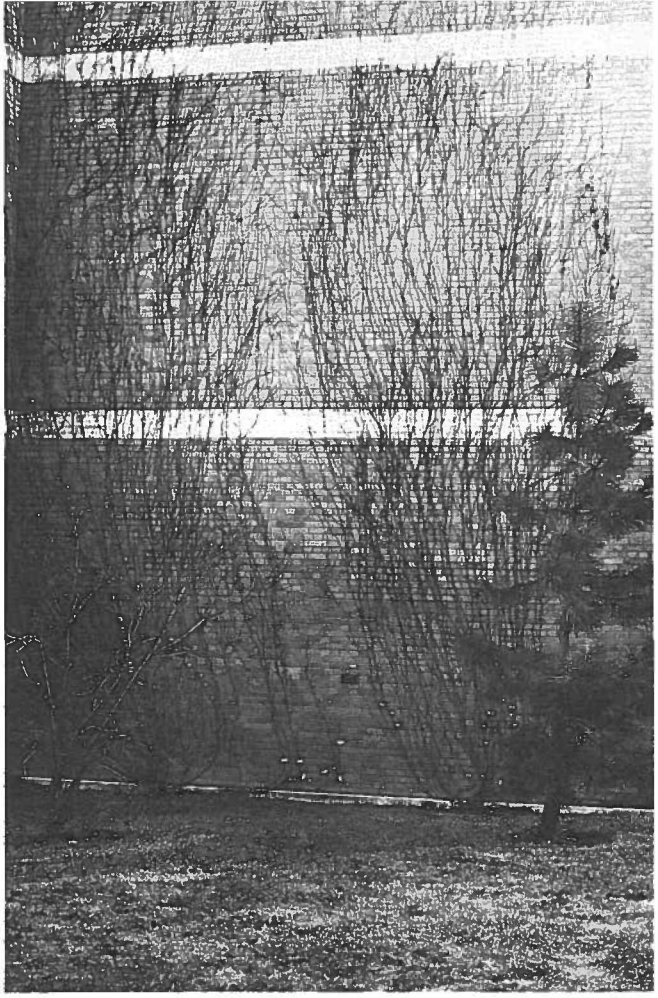
Aristolochia durior, the Dutchmans-pipe, over the north entrance of the Mathematics Annex building. The eight inch diameter leaves give the plant an exotic appearance

indicates a well justified increasing interest in this climber which is available in such variety and which is so well suited to the climate of southwestern British Columbia.

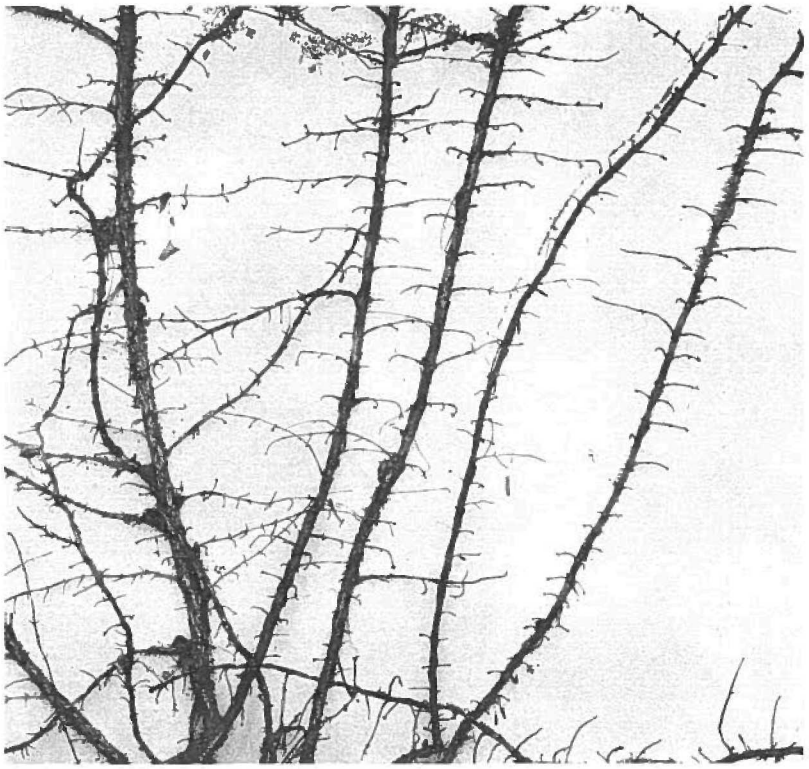
Evergreen climbers have not been planted extensively on campus, although various forms of English ivy, *Hedera helix*, are seen throughout Vancouver and Victoria. Early campus use of this vine was restricted to covering old forest stumps. Over the years, possibly because it did not have far to climb, the ivy has assumed its adult form, with its shrubby habit of growth, simpler leaves and bearing greenish flower clusters and black fruit.

The natural form of *Hedera helix* has been planted and has reached the top of the tall power house addition within the past decade. A cultivar, 'Digita', sometimes called Crowsfoot ivy, has completely covered the west wall of the Law Building. It was planted too at the foot of a wall near the Faculty Club, where it has grown up and over, trailing down to make a complete cover of the south face of the wall facing the parking lot.

English ivy has been adopted as the favorite nesting place of Vancouver's unique Crested Myna population. This chatty bird, like a Starling with white wing tips, was



Parthenocissus tricuspidata 'Veitchii', in winter condition on the wall of the UBC Forestry-Agriculture building



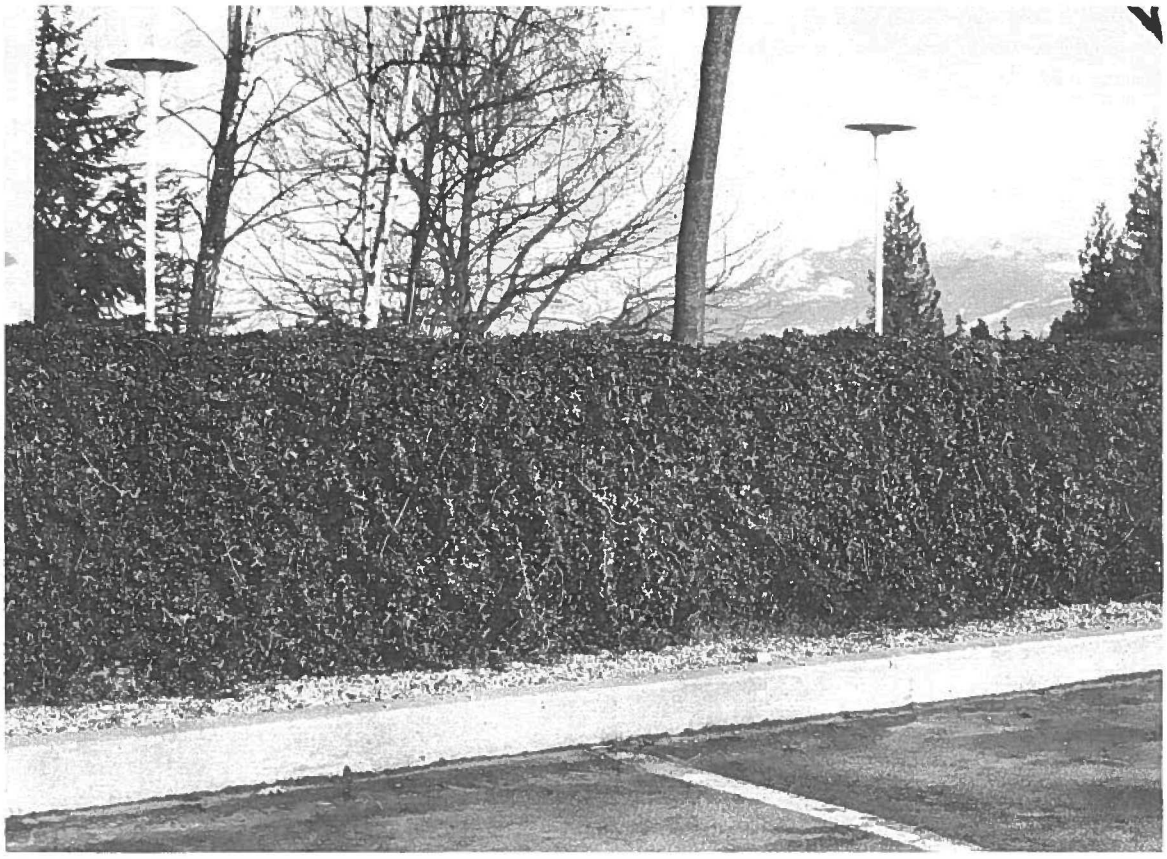
Hydrangea petiolaris trained on a wall of Home Management House showing the attractive branching pattern of the winter twigs

imported from Hong Kong about the turn of the century. Found only in the Vancouver area and across the Strait of Georgia at Nanaimo, it is noted as a mimic.

An increasingly popular use for *Hedera helix* is for ground cover planting. The variety *baltica*, being most vigorous, is used extensively.

There is no indication that the use of vines on newer University buildings will be extended. However, the story of climbing plants on this campus would not be complete without reference to the *Parthenocissus tricuspidata* 'Veitchii' which appeared on the plain brick wall of the inner court of the Forestry-Agriculture building. A professor, nearing retirement, whose office window faced this blank brick facade, planted two vines. He has tended them and carefully measured their growth. In four years they have reached the top of the three storey structure. A permanent plaque has been attached to the wall to acknowledge this unusual interest.

English ivy, Hedera helix 'Digitata', completely covers a wall fronting the UBC Faculty Club



Thuja plicata Donn ex D. Don in Lamb.

'WESTERN RED CEDAR'
Member of the Family Cupressaceae

Natural Distribution

Thuja plicata occurs in the coastal regions of south Alaska from Sumner Strait south through the coastal ranges of British Columbia through western Washington and Oregon to northern California where it is limited to the ocean side of the coast ranges in the fog belt. It extends eastwards to the western slope of the Continental Divide at latitude 54°30′N and thence south into the Selkirk, Bitterroot and Salmon River Mountains of Idaho. In B.C. it is a common forest tree west of the Cascades and also occurs in scattered pockets and on alluvial flood plains in the Similkameen and Okanagan Valleys.

Habitat

The habitat is humid with abundant precipitation (annual average 30″ – 60″, to 100″ at higher elevations) and atmospheric humidity. It favours cool summers and mild winters. *Thuja plicata* is generally found on stream sides, moist flats and ravines, terraces and gentle lower slopes, from sea level in the north to 7000′ in the Rockies of Idaho, where however the trees are very stunted. It grows to 2400′ in the Coast Range but to 4500′ in the Selkirks. It sometimes occurs in pure stands over small areas but is usually scattered among other species, especially in hemlock/spruce forest.

Description

Large evergreen, aromatic, monoecious tree with broad tapering strongly buttressed base, 150 – 175 (–200) feet high, with a diameter at the base of 5 – 8 (–16) feet. Trunks are often hollow in older trees. Young trees have a narrow conical and irregular crown with branches which reach to the ground while in older trees the crown extends in width becoming short and blunt and often with a dead top. In densely crowded stands the lower branches are lost after the tree reaches about 80′ but open grown trees retain their foliage to the ground. The slender branches curve upwards while young but with age they form a long downward graceful curve, turning upwards only at the ends.

The root system is shallow and widespreading but strong, although it may become deeper in a dry location. The trees depend for their support in nature largely on the intermingling of their roots with those of other trees.

The bark is thin (seldom over 7/8″ thick), scaly, divided into broad rounded ridges by irregular shallow fissures, separating into fibrous strips, tough, bright cinnamon red or brown.

Twigs are short and horizontal but tend to spread or slightly droop and then upturn with age, smooth, with many branchlets disposed in one plane and repeatedly two-ranked forming flat sprays. The branchlets are thickly covered with leaves, bright green becoming cinnamon brown, then dark lustrous brown often with a purplish tinge after the leaves have been shed.

Buds are naked.

Mature leaves are opposite, scalelike, closely appressed, green to dark yellow green and shining above, distinctly darker beneath with a bluish bloom and with frequent white triangular spots. On the leading shoot the leaves are parallel to the axis, ovate, long pointed with conspicuous resin glands beneath, about 6.5 mm long. On the lateral branches the leaves are shortly pointed, closely overlapping, about 3 mm long. They occur in 4 longitudinal rows, the lateral pair compressed and prominently keeled and nearly concealing the other pair. They are usually shed after 2 – 5 years. Aromatic when bruised.

Wood is pinkish or reddish brown when freshly cut becoming dark brown with exposure. It is aromatic, attractive, soft, lightweight, relatively low in strength, brittle, medium to coarse but very straight grained, remarkably durable, easily split and free from pitch or resin.

Flowers occur in April – May (to early June at higher elevations). The female flowers are solitary on short branches, about 10 mm long, ovate, with 8 – 12 opposite ovate, acute, leathery scales in pairs, the middle 2 or 3 pairs only are fertile bearing 2 erect pinkish ovules at the base. The male flowers are terminal on short lateral branchlets, numerous, subglobose to ovate, about 10 mm long, (3–) 4 pairs of stamens each with (3–) 4 subglobose pollen sacs, 4 – 6 peltate scales, yellowish or brownish in colour.

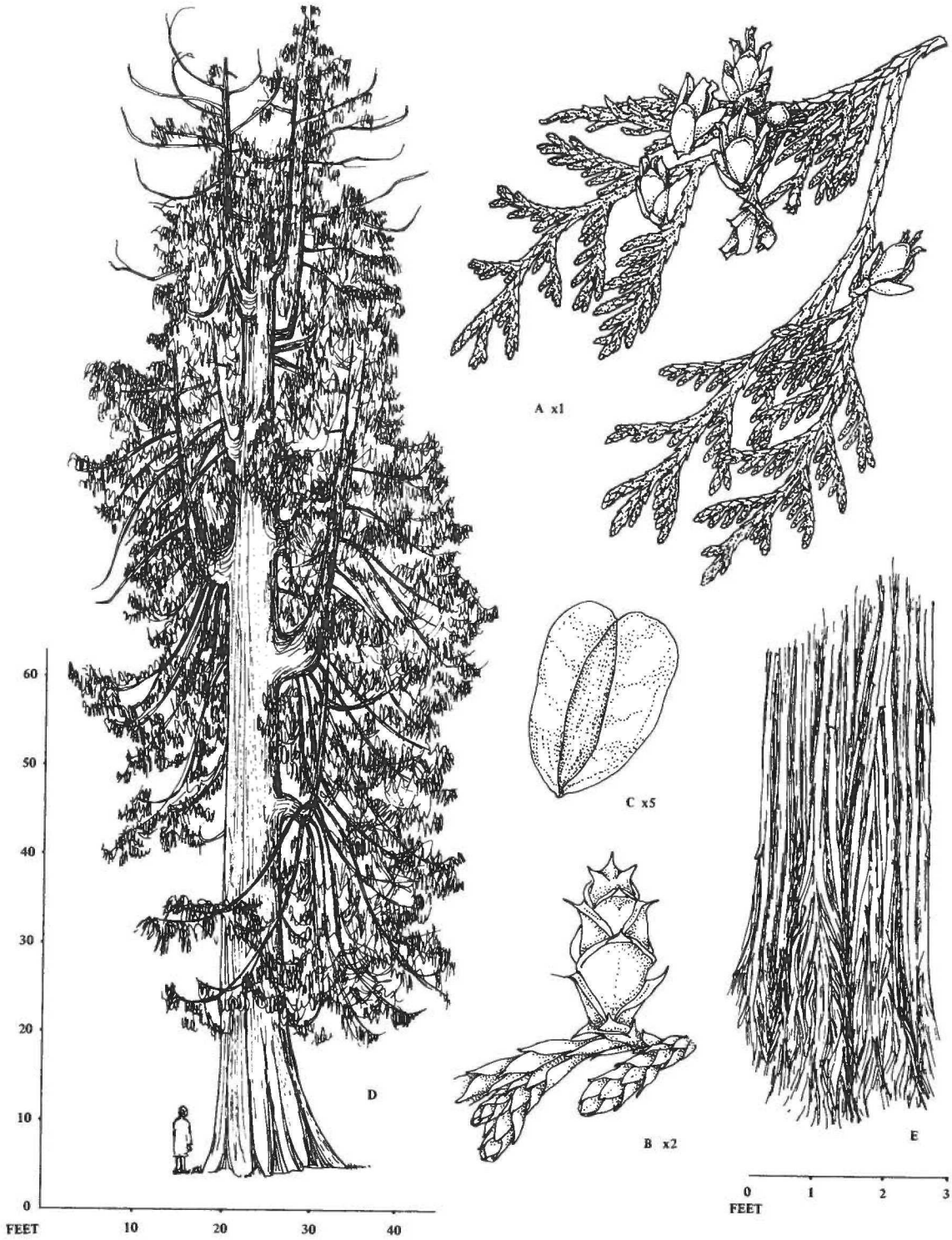


Figure 1. *Thuja plicata* A. Leafy branch with mature cones. B. Male cones and upright immature female cone. C. Winged seed. D. Habit of mature tree. E. Portion of trunk showing strips of bark.

The cones are ovoid-ellipsoid, erect, with ovoid leathery scales acute and mucronate at the tip, bluish green becoming brown, 8 – 10 (–12) mm long at maturity. The cones mature by mid-August of the first year when they turn downward before seedfall in late August or early September when the weather is cold with the humidity below 50%. Empty cones remain on the tree until the following summer.

Seeds are 6 – 7 mm long, ovoid, acute, compressed, light chestnut brown with a pair of small slightly unequal wings which are not quite as broad as the seed and only very slightly longer. The relatively small wing surface causes the rate of fall to be fast – the maximum distance for dispersal from 150′ height has been shown to be 400′. The seeds germinate in the fall in coastal areas, in early spring in the Rockies.

Propagation

Seeds grow readily with about 70% germination rate when sown in spring in sandy soil in a temperature of about 55°. The seedlings should be transplanted to open ground with partial shade. In nature there is heavy early loss of seedlings from fungi, birds and insects followed by loss from drought. Therefore some care is necessary.

Cuttings of the current season's growth about 2″ – 3″ long may be rooted in the greenhouse under light mist in midwinter or in sandy soil in a cold frame in September. This method is the only means of propagating cultivars.

Vegetative reproduction by adventitious roots from low-hanging limbs, trunks of fallen living trees or from living branches that fall onto wet soil can occur. However, subsequent growth is very slow.

Transplantation

Transplants easily with a ball of soil around the roots, September to November or February to April.

Conditions for Cultivation

The growth rate is slow – under the most favourable conditions (in the Puget Sound area) the maximum rate is 2.3 feet per year between the ages of 10 and 20 years declining to 0.61 feet per year after 60 years. Diameters of 2 – 4 feet are reached in 200 – 500 years, some of the largest trees on record are believed to be 800 – 1000 years old. The recommended hardiness zone for *Thuja plicata* in Canada is 6b (Sherk & Buckley 1968). Although the species is very tolerant of shade it grows best in full sun or partial shade. The soil should be deep moist well-drained loam. The nutritional requirements are very high – a rich supply of base saturated water, calcium, magnesium and nitrates. If using as a hedge, plant in a 3 foot wide trench about 3 feet apart in September, October, March or April. Training and pruning is best done between May and July inclusive.

Landscape Value

Free standing trees provide moderate shade and are most valuable for specimen trees on lawns, banks and margins of water, or for hedges. Dwarf forms are suitable for rock gardens. If grown in an open situation the dense compact foliage is retained to the ground throughout life giving a very attractive appearance. Trees are fairly resistant to wind when grown on dryish soil but on very wet soils the shallow root system makes them subject to windthrow. They lend themselves readily to trimming and shaping.

Availability

This species and some of its cultivars are readily available in British Columbia from Lower Mainland and Vancouver Island nurseries.

Ornamental Cultivars

Trees from inland sources are hardier than those from the coast, with greater frost resistance, and have lustrous dark green foliage which turns a delightful bronze in the fall. A number of cultivars have been developed in Europe although several of these are now either very rare or lost to cultivation. den Ouden (1965) lists 12 cultivars which are still available including cv. 'atrovirens' with shining dark green leaves and such dwarf forms as cv. 'Rogersii' (a pyramidal golden yellow form), and cv. 'Cuprea' (a conical and very slow growing form) as well as forms such as cv. 'Stoneham Gold' (a large bush with gold coloured leaves) and cv. 'Zebrina' (a pyramidal tree with the foliage golden zebra striped although the variegation and colour varies on the same tree).

Other Uses

Because of its resistance to decay, warping or shrinking and because it works easily *Thuja plicata* is used in situations favourable to decay, e.g., for shingles, lumber, posts, pilings, boats, pattern stock, laundry machinery, cigar boxes, greenhouse framework, house exteriors, etc. Paints, varnishes and lacquers adhere well and it glues readily. In the areas of its natural occurrence it forms one of the important timber trees. The Indians of the Pacific Northwest used the Western Red Cedar for their totem poles, war canoes and lodges, bark from young trees for mats, baskets, rope, fishing line and even thatch for the lodges.

Diseases and other problems of cultivation

The thin bark and shallow roots make *Thuja plicata* very susceptible to fire. The foliage is easily windburned late in winter if planted in exposed situations. Winter damage to young trees is serious particularly when severe cold waves follow mild weather, therefore some protection is advisable for these. Otherwise the species has few insects or other enemies. Fungi and viruses may cause root and trunk rots but in most cases they only invade already weakened trees. Cedar flagging is a term which has been given to the natural dieback of the tree, the dead red brown foliage falls during autumn and winter storms. This may be much more noticeable in some years because it occurs earlier or over a short period of time, and there is a suggestion that it is caused by a hot summer (H.N.W. Toms, personal communication).

Argyresthia sp. – 'leaf miner' or 'tip moth', is the larva of a tiny gray moth which feeds within the leaves causing the leaf-tips to turn brown. This is not serious on *T. plicata*, but it is a good idea to trim and burn all infected leaves as other species of ornamental trees are much more susceptible and there is always the danger of cross infection.

Didymascella (Keithia) thujina – 'leaf blight' is very serious in some years on seedlings and young trees. It is believed to be favoured by high humidity and may be fostered by a late spring snow cover.

Poria sericeo-mollis 'trunk rot' and *P. weirii* 'root and butt rot' cause some damage.

Armillaria mellea – 'honey mushroom' is often found around the base of the tree.

Origin of the name

The generic name is derived from an ancient greek work *thuia* for an aromatic evergreen tree the wood of which was highly prized for choice durable furniture, but which is now believed to have been a juniper. The specific name *plicata* means plicate or folded into plaits, and was perhaps suggested by the regularly arranged scalelike leaves. The general term Arborvitae means the "tree of life" and was a name first given to *Thuja occidentalis*. Survivors of Jacques Cartier's expedition to Canada in the early 16th Century were apparently saved from scurvy by a decoction made by Indians from the branches. Subsequently the King of France named it "l'arbre de vie" (arborvitae). *Thuja plicata* was named from a specimen at Nootka Sound.

REFERENCES

Collingwood, G.H. & Warren D. Brush. 1962. Knowing Your Trees. 1955 Edition. The American Forestry Association, Washington, B.C.

Hitchcock, C.L. et al. 1969. Vascular Plants of the Pacific Northwest. Part I. Vascular Crytogams, Gymnosperms and Monocotyledons. Univ. of Washington Press, Seattle and London.

Hosie, R.C. 1969. The Native Trees of Canada. 7th ed. revised. Canadian Forestry Service, Department of Fisheries and Forestry. Queen's Printer (Information Canada), Ottawa.

Krajina, V.J. 1969. Ecology of Forest Trees in British Columbia. Ecology of Western North America 2(1):1–47.

den Ouden, P. 1965. Manual of Cultivated Conifers. Martinus Nijhoff, The Hague.

Pirone, P.P. 1970. Diseases and Pests of Ornamental Plants. 4th ed. Ronald Press Company, New York.

Sherk, Lawrence A. & Arthur R. Buckley. 1968. Ornamental Shrubs for Canada. Research Branch, Canada Department of Agriculture. Publication 1286. Queen's Printer, Ottawa.

Silvics of Forest Trees of the United States. 1965. USDA Agriculture Handbook No. 271.

Sudworth, G.B. 1908. Forest Trees of the Pacific Slope. 1967. republication by Dover Publications Inc., New York.

Westcott, Cynthia. 1946. The Gardener's Bug Book: 1,000 Garden Pests and How to Control Them. The American Garden Guild and Doubleday and Company, Inc., New York.

Botanical Garden News and Notes

Seed Exchange Program 1971 – During the 1971 season 7,793 packets of seed were distributed to some 325 institutions throughout the world. The greatest demand was for native seed particularly those of the conifers growing in the Lower Mainland or southwest region of British Columbia. The 1971 Index Seminum has now been distributed to nearly 500 institutions. This year's seed list lists some 478 species and varieties representing 70 families. A special section was added this year to accommodate the research grass collection that has been developed by Dr. J.R. Maze of the Department of Botany.

Gardening though the Seasons – During the months of February and March the staff of the Botanical Garden are offering two instructional programs under the auspices of the Centre for Continuing Education at the University. The first course will cover the basic principles of propagation, planting and the growing of flowers, fruit and vegetables through the spring and summer months. It is designed as a home owners' course. The second program will be concerned with gardening for apartment dwellers.

Nitobe Memorial Garden 1971 – This garden continued to be a focal point of public interest at the University and 92,706 visitors were recorded during the summer months. A large number of school children and hospital groups took time to visit the garden. The Vancouver Ikebana Society provided weekly exhibits of floral arrangements for the tea house.

Staff activities – Members of the staff continued to be active in various horticultural and professional societies during the past year. Mr. Ken Wilson was elected President of the Vancouver Rose Society. Mr. David Tarrant was elected Vice President of the Vancouver Orchid Society and Mr. Jim O'Friel continued as a Director of the Alpine Garden Club of British Columbia. Dr. Roy L. Taylor was elected Director of The American Association of Botanical Gardens and Arboreta. A Plant Improvement Committee was established late in 1970 to develop a program to improve the overall quality of ornamental nursery stock being grown in British Columbia. A five member committee was established with Dr. John W. Neill and Mr. Ken Wilson of the U.B.C. Botanical Garden serving on the committee. The first action of this committee has resulted in establishment of a program to review and propagate virus free stock of flowering cherries.

Climatological Summary for 1971*

The weather pattern in 1971 was generally cooler and drier with slightly less sunshine (1775.3 total hours) than the ten year average. Temperatures range from a high of 84°F in July to a low of 13°F in January and December, with the March maximum and minimum temperatures the lowest in the past decade. Yearly rainfall at 41.52" was below the average while the total snowfall at 99.35" was more than double the previous highest recorded total. An 11" snowfall on February 26th was the greatest amount recorded in any twenty-four hour period in the past ten years. We are currently looking into the possibility of obtaining additional wind data which might provide more meaningful information for horticultural use than the present "mean mileage" figures.

Data	*October*	*November*	*December*
Mean temperature	48.75°F	43.75°F	34°F
Highest temperature	65°F	55°F	50°F
Lowest temperature	28°F	32°F	13°F
Grass minimum temperature	17°F	21°F	1°F
Total rainfall/No. days with rainfall	7.00"/18	8.34"/22	4.86"/17
Total snowfall/No. days with snowfall	trace/1	nil	34.6"/16
Total hours bright sunshine/possible	121.2/318.43	43.8/268.23	50.0/253.2
Mean mileage of wind at 3'	89.4	91.8	91.1
Mean mileage of wind at 40'	130.8	133.9	128.7

**Site: The University of British Columbia, Vancouver, B.C., Canada.*
Position: lat. 49° 15'29"N; long. 123° 14'58"W. Elevation: 342.6'.

Juncus acuminatus, a tall rush of wet places in southwestern British Columbia

DAVIDSONIA

Volume 2 Number 4 *Winter* 1971

Contents

Vines and Climbers at UBC 37
Thuja plicata Western Red Cedar 41
Botanical Garden News and Notes 45
Climatological Summary for 1971 45