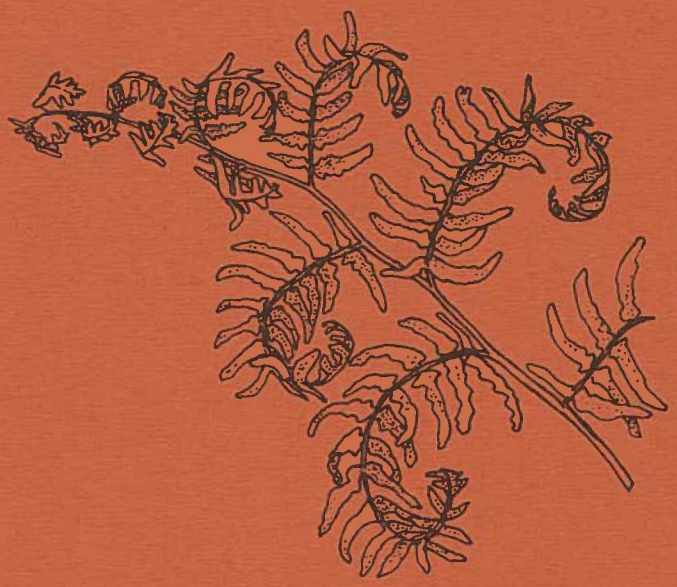
DAVIDSONIA

VOLUME 4 *NUMBER 4* *Winter 1973*

Cover

A night winter snow scene on Mt. Seymour near Vancouver, B.C.



A portion of a dead frond of the common bracken fern, *Pteridium aquilinum*, found throughout most of the disturbed woodland in southwest coastal British Columbia.

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Some Ericas and Callunas

KENNETH WILSON

There are few groups of plants which provide the diversity of form and colour throughout the year as the hardy heaths and heathers. They are accommodating plants, adapting themselves to varying conditions. In the wild, *Calluna vulgaris* grows from the Arctic Circle across Northern and Central Europe to southern France, whereas *Erica carnea* can be found growing at 2800 m (ca. 9000 ft.) in the mountains of Europe. In cultivation they will grow in a wide range of soil conditions from almost pure sand to heavy clay, although a well-drained moisture-retentative soil provides the ideal medium in which to grow these plants. *Calluna vulgaris* and most of the hybrids of *Erica* must have acid soil conditions, whereas *E. carnea, E. mediterranea* and the *E.* × *darleyensis* cultivars tolerate or prefer a neutral to slightly alkaline one.

The cultivars of *Calluna vulgaris*, flowering from August to November, provide the widest colour range of flower and foliage as well as growth habit of the three genera commonly grown in this area. In the medium-to-tall growing group (18-24″ high), 'H. E. Beale' with its silvery pink double flowers is outstanding. The free-flowering purple red spikes of 'C. W. Nix' and 'Alportii' are always attractive as are the lilac purple shades of 'Barnett Anley', 'Hiemalis' and 'Underwoodii'. Of the low-growing types, 'County Wicklow' is a compact and floriferous double pink. 'J. H. Hamilton', with its bright pink flowers and dark green foliage, and the purple flowered 'Foxhollow Wanderer' are equally floriferous and grow to cover a much larger area.

For those people who want to grow some "lucky" white heather, the cultivars 'Alba Plena', 'Hammondii' and 'Caerketton White' are excellent.The shorter growing but free-flowering 'Else Frye' is equally attractive.

For a striking contrast in the winter months, *C. vulgaris* 'Orange Queen', 'Sunset' and 'Robert Chapman', with their brilliant orange and red foliage, will brighten any garden. The dwarf but sparse flowering mound types, 'California Midge', 'Minima Smith's Variety', 'Pygmaea' and 'Mousehole', growing no more than 4-6″ high, provide added interest while the golden foliage of 'Beoley Gold', 'Gold Haze' and 'Golden Feather' are attractive throughout the year if planted in full sunlight. Of the numerous hybrids of *Erica, E.* × *watsonii* 'Dawn' and 'H. Maxwell' are vigorous and showy, while 'P. D. Williams' and *E.* × *stuartii* are compact growers, flowering from mid-July to September.

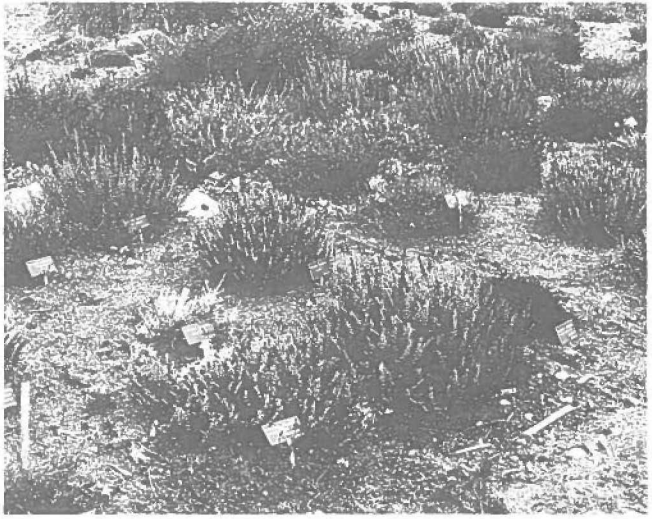
The winter-flowering *Erica carnea* cultivars, which grow in limey soils, will withstand heavy shade and flower through snow and frost. 'December Red', with rose pink flowers, and 'Praecox Rubra', a bright rosy red, were in full flower in the Botanical Garden in January in spite of ten consecutive nights of 15-20°F temperatures.

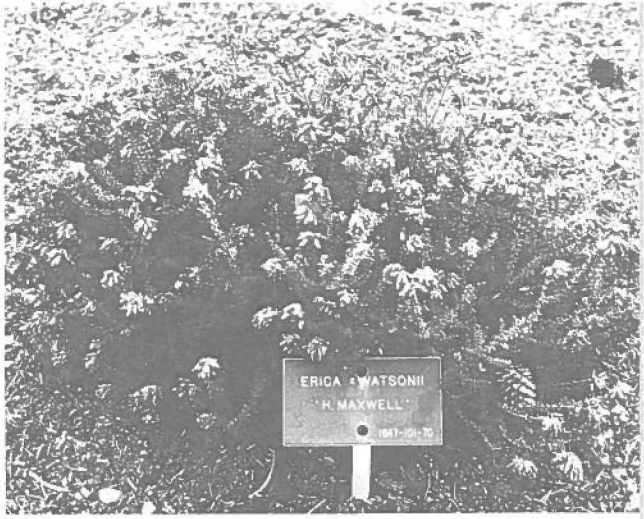
The cultivars 'Pirbright Rose', 'Loughrigg', 'Springwood White' and 'Springwood Pink' are the most vigorous of the carnea group, the latter two making excellent ground cover plants. The hybrid, *E.* × *darleyensis* 'Silberschmelze' resembles the carnea group. Its vigorous habit and silvery white flowers lasting from December to May against a dark green foliage make it an outstanding cultivar.

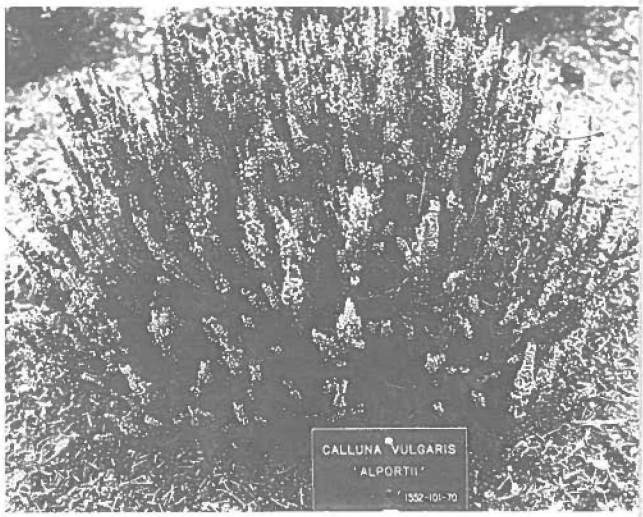
Erica tetralix, which prefers wet places and acid conditions, reaches its peak flowering in early July, then continues to produce sporadic flowers until November. The cultivar 'Alba Mollis', with its silvery gray foliage and white flowers, is particularly striking. 'Pink Star', 'Rubra' and the cerise flowered 'Ken Underwood' are of similar habit, often flowering in early June. *Erica vagans* 'Lyonesse' and 'Mrs. D. F. Maxwell', with their white and rose-coloured candlelike flowers, are a must in any heather planting. For planting on relatively dry sunny slopes, *Erica cinerea* will usually succeed although it is sometimes difficult to establish. 'Hookstone Lavender' and 'Vivienne Patricia' are strong growers and equally floriferous. 'Grandiflora', rosy purple, and 'Apple Blossom', white flushed with pink, are also good cultivars. All flower from June to August.

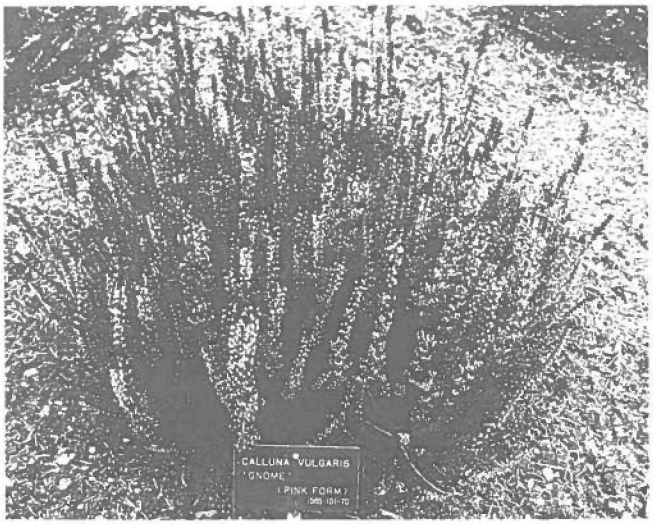
Heaths and heathers require only the minimum of care and attention to achieve almost garden perfection. They will in fact survive and flower for several years without any attention. Before planting, the soil should be dug and a generous amount of peat moss or well-rotted compost added, especially if the soil dries excessively in the summer months.

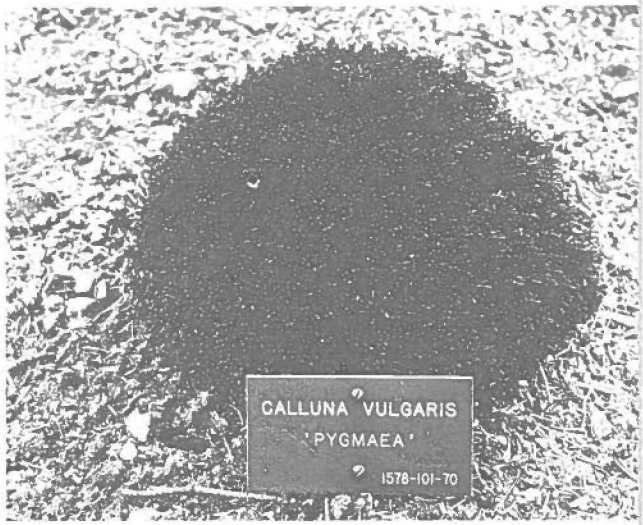
For the enthusiast of hardy species, varieties and cultivars of heaths and heathers, the recent book by Terry L. Underhill entitled: *Heaths and Heathers—Calluna, Daboecia and Erica* published by David and Charles in 1971 will provide much detailed information about this interesting group of cultivated plants.











Three year old plants of *Erica* and *Calluna* growing in the Botanical Garden nursery and photographed in early January. (1) *Calluna vulgaris* cultivars with *Erica ciliaris* 'Mrs. C. H. Gill' in the background. (2) A summer flowering *Erica* hybrid with large bright pink flowers like those of *E. tetralix*. (3) A deep pink winter flowering *Erica* hybrid. (4, 5 and 6) Tall (up to 50 cm), medium (up to 25 cm), and dwarf growing forms of *Calluna vulgaris*.

Flora of British Columbia
– A New Botanical Garden Program

ROY L. TAYLOR

The province of British Columbia contains one of the richest assemblages of vascular plants in Canada. This is largely because of the great variety of terrain, latitude and the many environmental zones available for plant growth. British Columbia has a total land area of 366,255 square miles, or 9.5% of the surface area of Canada, of which nearly 270,000 square miles are drained by six rivers, i.e., Fraser, Liard, Peace, Columbia, Skeena and Stikine. The province has 1,180 miles of continental maritime coastline, plus many more miles associated with the numerous islands along the coast. The largest of these, Vancouver Island, is nearly six times the size of Canada's smallest province, Prince Edward Island. As well as covering a large land mass, the latitude changes through 11 degrees and the altitude varies from sea-level to 15,300 feet (4665 m).

Recently the province has been divided into 11 biogeoclimatic zones by Krajina (1969). These zones have approximately 130 plant associations in the forests, 60 in the grassland and alpine terrestrial habitats, and 80 in marine, lacustrine, swamp and other aquatic habitats (Krajina 1973). The biogeoclimatic zonation program is being used in the establishment of ecological reserves. This active program in British Columbia was an outgrowth of the International Biological Program. The conservation of selected terrestrial ecosystems, both disturbed and non-disturbed, provides a number of examples of different ecosystems in the Province for research and educational purposes. These ecological reserves are created and administered under the authority of the Ecological Reserves Act which forms Chapter 16 of the Statutes of British Columbia and was passed in 1971. These reserves serve as important gene pools of our vegetation in the Province. Some 53 reserves representing 89,608.24 acres have been established as of October 1973.

The percentage of vascular plant species of Canada found in British Columbia is 40%. The nearly 2200 species often possess infraspecific variation that has been formally recognized, thus the total number of taxa is somewhat larger. Some of the endemic taxa to British Columbia are discussed in the *Flora of the Queen Charlotte Islands* by Calder and Taylor in 1968*.

The vascular flora of the Province was first described by J. K. Henry in 1915*, when the *Flora of Southern British Columbia* was published as a text for secondary schools. This volume has remained the only complete flora of the area. Mr. J. W. Eastham, working for the Provincial Government and after retirement with The University of British Columbia, published a supplement to Henry's Flora in 1947*.

In the 1950's two popularized guides were produced; *Trees, Shrubs and Flowers to Know in British Columbia* by C. P. Lyons*; and, *Pocket Guide to the Trees and Shrubs of British Columbia**. Also during this period, the Provincial Museum began a series of handbooks on specific groups of plants of the Province under the guidance of Dr. A. F. Szczawinski.

In 1966, Dr. T. M. C. Taylor* of the Botany Department at U.B.C. published a checklist of the vascular plants of British Columbia based on herbarium records, principally those at U.B.C. During this same period, the Canada Department of Agriculture conducted an extensive series of surveys of the vegetation of the Province and, as a result of two of the summer surveys, a two-volume work entitled *Flora of the Queen Charlotte Islands* was published in 1968*.

Significant general illustrated floras including portions of British Columbia or major regions adjacent to the Province were completed in this same period, i.e., *Vascular Plants of the Pacific Northwest* by Hitchcock et al.*, and *Flora of Alaska and Neighboring Territories* by Eric Hultén*. These two major works continue to have a profound influence on systematic and phytogeographic research conducted on British Columbian plants.

In the 1970's a generalized account of the plants of the Saanich Peninsula on Vancouver Island was published (Szczawinski and Harrison 1973*), and the long-awaited condensed manual of the earlier five-volume work appeared entitled *Flora of the Pacific Northwest* by Hitchcock and Cronquist (1973)*. Later in the same year an elegantly illustrated work in color was produced by Dr. L. J. Clark*. This work is concerned with 792 of the more colorful taxa in the flora.

The year 1973 also saw the start of a major new program by the Botanical Garden at U.B.C. to produce an illustrated manual of the plants of British Columbia. This program is an outgrowth of the earlier Flora

*References asterisked in the text can be found in Appendix.

North America Program which was suspended in February of 1973 (see Galston 1973, Hall 1973, Irwin 1973, MacBryde 1974 and Walsh 1973). The Flora of British Columbia Program is designed in three stages. Stage I consists of the development of a descriptive resource inventory of all the vascular plants of British Columbia. Stage II will be the development of an illustrated and keyed manual of the vascular plants, including pertinent synonymy and discussion. Stage III will be the development of a completely documented Flora. The first two stages are being conducted by the Botanical Garden with major support from the National Research Council of Canada. The third stage will be the prime responsibility of the Provincial Museum in Victoria.

The annotated resource inventory is being developed through the use of a computer-based program utilizing many aspects of the Flora North America Program (Gates 1971, Krauss 1973, Porter et al. 1973, Shetler 1971, Shetler et al. 1973). A two-page format is completed for each taxon and contains the following information: botanical name, common name, authority, distribution using the biogeoclimatic system proposed by Krajina, status in the flora, e.g., native, endemic, introduced, cultivated only, and eight other categories: duration, habit, sex or spore status, flower color, fruit type or organization of sporangia, fruit color, flowering or sporulating time, chromosome number status, poisonous status, principal economic status, potential ornamental attributes and finally, the endangered status in B.C. In addition to the information collected according to the 17 categories, pertinent literature references are also being accumulated at the same time so that a nearly complete literature resource inventory on the plants of British Columbia will also be generated.

The initial inventory has been gathered by using a number of references and these are found in the Appendix. This list, although not complete, does provide a person interested in the current flora with a basic set of literature references. The program is now well under way and the published resource inventory will be completed prior to March of 1975. The inventory will provide basic data for any person working on the vegetation of British Columbia. It will be particularly useful for resource planning and management programs and represents an attempt by the Botanical Garden to meet its objectives of research and public information.

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APPENDIX I

FBC STANDARD REFERENCES

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Ilgachuz Mountain Range, found about 20 miles north of Anahim Lake Village in west central British Columbia, possesses arctic tundra vegetation. UBC ecological reserve survey party on Stonecrop Ridge (ca. 7500′) overlooking Blue Canyon Creek. The two prominent peaks in right background are: left Crepis Peak, right Nana Peak. Party is composed of left to right: Dr. C. E. Beil and Mr. Stephen Oliver, Botany Department; Dr. R. L. Taylor, Botanical Garden.

Festuca altaica Trin. growing in an upper alpine habitat in the Ilgachuz Range of British Columbia. This bunch grass forms extensive meadows in the subalpine regions of this mountain range. It is distributed from Central Asia to Alaska, Yukon, the Northwest Territories and northern British Columbia.

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Picea sitchensis (Bongard) Carriere

SITKA SPRUCE

Member of Family Pinaceae

Natural Distribution

Picea sitchensis occurs in a relatively narrow band along the coast from the eastern end of Kodiak Island, Alaska south to Mendocino County, California. It has been reported to be migrating westward on Kodiak Island during the last few centuries. In British Columbia the species is found most commonly in a narrow strip along the coast and on adjacent islands, usually below 1000′ elevation and seldom more than 50 miles from tidewater, although there are scattered trees in the Fraser Valley as far east as Hope. The species also extends north in the Cheakamus River Valley to Garibaldi Station. The best growth in British Columbia is along the western part of Vancouver Island and on the Queen Charlotte Islands.

Habitat

Picea sitchensis grows best in moist lowland sites, often on sandy soil, and frequently facing the ocean in cool temperate regions. In the far north it may occur on wet rocky slopes—dwarfed specimens have been found as high as 3500′-3900′ on unglaciated rocky outcrops (nunataks) projecting above the Juneau Ice Field in Alaska. It is usually found from sea level to about 1500′(-3000′) with the maximum elevation becoming lower in the southern parts of the range. The weather in the range of the species is characterized by equable temperatures, high precipitation, approximately 200 days of cloud per year and an absence of extreme winter cold. The climatic variations within the range are not great because of the equable ocean currents of the northern Pacific Ocean. It occurs either in pure stands or as the dominant species in mixed stands with Western hemlock or Pacific silver fir—the pure stands are essentially subclimax and are eventually replaced by a climax vegetation of Sitka spruce/Hemlock or Hemlock/Western red cedar.

Description

A tree 35-60(-70) m tall with a DBH of 1.0-1.4(-5) m or more. Maximum growth is attained on the Olympic Peninsula of Washington and the Queen Charlotte Islands. Trees become smaller as one moves westward in Alaska to Kodiak Island and may even be reduced to low shrubs in the extreme northwest where it extends beyond all other conifers. The mature tree is often impressive with a swollen and buttressed base, straight slightly tapering trunk free of branches for about half its height and an open conical crown with slender, whorled, horizontal, rigid branches with the uppermost ones ascending and drooping at the ends. An open grown tree seldom attains the height of a forest specimen and the trunk is clothed to the ground with huge sweeping branches. The leader is erect. Branch stubs remaining after the loss of large limbs in the lower crown are very resinous and remain on the trunk for many years. Epicormic (or adventitious) branches develop along the trunk even in dense stands, becoming much stronger when light is increased by removal of nearby trees—trees along roads may develop a solid mass of new foliage from the base to the crown.

The root system is usually shallow and widespreading, although roots have been found at depths greater than 6′ in well-drained alluvial soils in the Queen Charlotte Islands. The roots may protrude above the soil in mature trees.

The bark when young is dark grayish brown, sometimes bright cinnamon red, thin and smooth, occasionally scaly. As the bark ages it becomes dark purplish or reddish brown with large and easily detached thin scales.

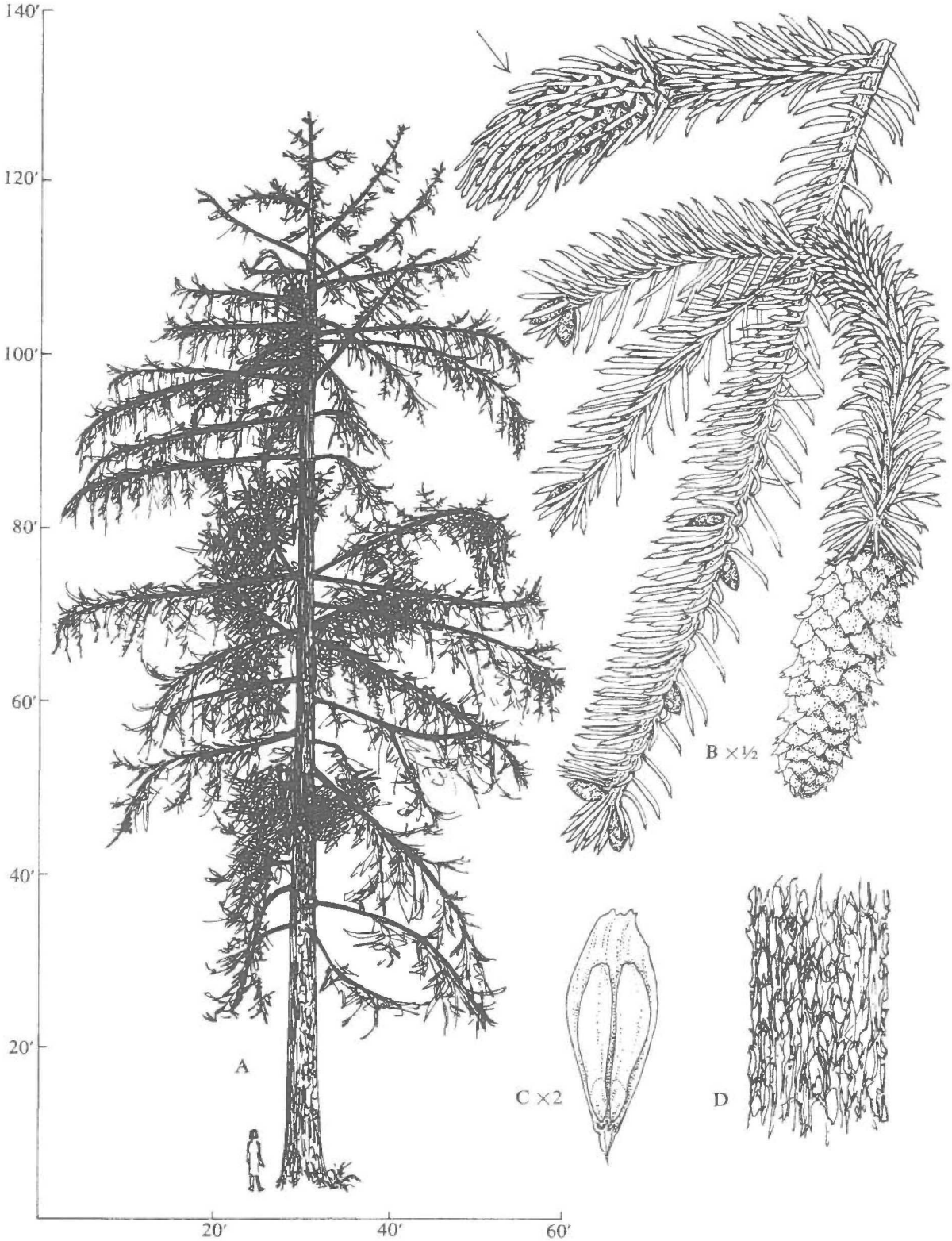

FIGURE 1. *Picea sitchensis* (Bongard) Carrière. A. habit, B. cone bearing branch with typical gall (indicated by arrow in upper left) caused by the Sitka spruce gall aphid, C. seed bearing cone scale, D. bark texture.

Twigs are slender, drooping, glabrous, light brown to dark brown or dark gray brown, smooth when young but becoming rough with age due to the persistent peg-like bases of the needles.

Buds are ovoid, acute or conical, apex pointed, 6-12 mm long; scales are pale chestnut brown, apex obtuse but often tipped with short points and more or less reflexed above the middle. Buds usually in threes, the two lateral in the axils of upper leaves. Not resinous.

Mature needles are borne singly, light green to bright bluish green, stiff, linear and entire, (1–)1.5-2.5 cm long, about 1 mm broad, acute or acuminate at the apex, flattened with the 4 angles indistinct (unique among North American spruces), with 2 broad whitish bands of stomata on the upper surface, lower surface keeled and with 2 whitish stomatal bands much narrower than those of the upper surface or sometimes none. Needles spirally arranged, standing out on all sides of the branchlets with those on the upper surface tending to be directed towards the ends of the branchlets. Narrowed rather gradually to the base where jointed to a prominent persistent base. On young plants more or less concentrated and twisted at the top of branchlets. Needles may be thicker and more crowded in tops of tall trees than lower down. Needles persistent for 7-11 years.

Wood pale pinkish brown with a gradual transition to nearly white sapwood, moderately lightweight and soft, of a fine and even texture and usually straight grained. No odour or taste. Works easily and has a silky sheen on planed surfaces, easily kiln dried and shrinks and swells only moderately.

Flowers in late March-May on branchlets of the previous year. Monoecious (male and female flowers on different parts of the same tree). The female or pistillate flowers are yellowish green often tinged with red, about 2.5 cm long and 1.2 cm thick when receptive, ovoid to cylindric, erect, short-stalked, with numerous round or pointed scales completely hidden in axils of elongated acuminate bracts, on ends of rigid terminal shoots of branches in the upper half of the tree. The male or staminate flowers or strobili are reddish, 2-4 cm long, about 1 cm diameter, borne in large numbers near the ends of pendent lateral branchlets.

Cones are reddish brown to yellow brown to ultimately brown often tinged with dark red on the side nearest the sun when mature, (5–)6-9(–10) cm long, 2.5-3 cm broad at maturity, narrowly oblong-cylindrical, short stalked, flexible, erect at first becoming pendent with maturity. Scales oblong, rounded at apex, finely erose-denticulate, rather stiff, thin, narrow, persistent on cone axis. Bracts narrowly ovate, finely toothed, much shorter than the scales and almost completely concealed by them. Cone matures in the first autumn and is deciduous mostly during the first autumn and winter.

Seeds are about 3 mm long, pale reddish brown, full and rounded, acute at base, 2 per scale, no resin ducts, wing narrow, oblong, slightly oblique, 8-12 mm long, detaches completely from seed. Outer seed coat crustaceous, inner membraneous, pale chestnut brown. Shed in mid-to-late September with most seed shed by February. Trees begin to bear seed at 20-40 years with a few cones in the upper part. The species is usually considered a prolific seed bearer with a good crop being produced every 3-4 years.

Propagation

Seeds germinate easily (germination rate about 67%) in any wet or constantly moist soil but for the first few years the seedlings are sensitive to frost and drought. It may be best to stratify for 1-3 months at about 42°F before sowing. In nature germination is best on bare mineral soil with side shade and overhead light, moisture is extremely important.

Cuttings taken from terminal shoots in late winter or early spring have been successfully rooted in slightly acid sand under high light intensity in a greenhouse. Treatment with root-inducing hormones or wounding is helpful. Vegetative reproduction in nature is uncommon but layering has been known to occur, especially by bushy trees in bare or open areas in Alaska (e.g., at Glacier Bay).

Transplantation

Best to use nursery grown stock although the shallow root system indicates that *Picea sitchensis* could be transplanted easily with a ball of soil around the roots.

Conditions for Cultivation

Generally considered a vigorous fast-growing tree—heights of over 60 m have been reached in 100 years and the species may live 800-850 years. The largest tree known was from Forks, Washington and was

approximately 75.6 m tall with a DBH of 5.4 m. The recommended hardiness zone for *Picea sitchensis* in Canada is Zone 5. The climate must be cool and humid and the soil should be deep, rich, moist but well drained and have a pH in the 4.5-6.0 range. The species requires a rich supply of available calcium and especially magnesium (lack of Mg causes dieback of the leader), and a plentiful supply of phosphorus. Tolerant of shade except when young when classed as intolerant.

Landscape Value

Picea sitchensis forms a fine specimen tree for parks or the larger lot; it is especially popular for this purpose in England and western Europe. It is not suitable for growing in regions with hot dry summers unless the trees are watered or mulched heavily. Unfortunately the difficulty of control of certain pests precludes its landscape use in southwestern British Columbia.

Availability

No known Canadian source for nursery material.

Varieties and Ornamental Cultivars

Two hybrids are known to occur in nature where the ranges of *Picea sitchensis*, *P. glauca* and *P. engelmannii* overlap. *Picea* × *lutzii* Little (*glauca* × *sitchensis*) is known from the Kenai Peninsula of Alaska and the Nass and Skeena Valleys of British Columbia and may be expected to occur elsewhere along the border between coastal and interior forest types. The hybrid is intermediate between the parents in size and needle and cone characteristics. Hybrids with *P. engelmannii* have been found in the Skagit Valley of British Columbia but apparently are not named.

The Golden Spruce of the Queen Charlotte Islands has been the subject of much interest. Two trees occur on the banks of the Yakoun River near Juskatla. The largest and best known is nearly 50 m tall with a DBH of just over 2 m and is estimated to be 400 years old. The outer sun foliage is a bright golden yellow, whereas the inner shade foliage is green but not as dark as in a normal tree. In 1969 Scott conducted studies in chlorophyll composition and content, and found that the sun foliage needles of the golden variety contained 40% more carotene but 5 times less chlorophyll when compared to normal sun foliage. Attempts have been made to propagate this unusual variety by grafting and unrooted cuttings, and material has been produced by both methods according to Dr.Oscar Sziklai of the U.B.C. Faculty of Forestry (personal communication). The generation of the variety from seeds has not been tested.

Ouden (1965) lists one form and several cultivars which have been developed, primarily in Europe, but only one cultivar ('Compacta') is apparently still available. The cultivar 'Compacta', is a dwarf, conical, compact, dense, broad shrub, 1.5-2 m high, with spreading branchlets. Cultivars 'Fastigiata', 'Microphylla', 'Nana' and 'Speciosa' and f. *crispa* have apparently been lost to cultivation.

Other Uses

Picea sitchensis is considered to be an excellent lumber tree. Commercial stands are found throughout the range, although in California they occur only in narrow strips along coastal streams. The wood was used for airplane construction in both World Wars, but is now used chiefly for boat-building (particularly racing sculls), furniture, fences, cooperage, planing mill products, doors and for food containers because it is practically tasteless and odourless. Because of its natural light colour, low resin content and fibre characteristics, it is very important in the production of high-grade wood pulp used extensively for newsprint. A small quantity of slowly grown highly resonant timbers are specially selected for piano sounding boards. In the British Isles it is the most commonly planted conifer in reforestation programmes, especially in the north and Wales. Seedlings are sometimes used commercially as understocks to propagate Koster blue spruce (*Picea pungens* 'Koster').

The West Coast Indians have used *P. sitchensis* for many purposes. The Makah Indians of Washington ate the young shoots raw. Several tribes used the very pliable roots and smaller branches of young trees to make baskets and household articles and for "sewing" wood in box-making. The Bella Coola Indians of British Columbia used practically every part of the tree for medicinal purposes. The tips of young spruces were mixed with blue currant, young juneberry and crushed branches (stems and leaves) of garden snowberry, boiled and taken internally for gonorrhoea. The gum boiled and taken internally while hot was believed to act as a diuretic for the same complaint. Sap from the peeled trunks was taken in doses of one-half

to one cupful from May to August as a laxative. A bed consisting of a sack of ripe cones or a 5′ by 2′ piece of bark (inside uppermost) placed on top of hot stones was believed to be good for rheumatism. A similar bed but with a few leaves of devil's club on top of the bark was used for chronic backache. Spruce gum was applied to small cuts, broken skin and suppurating sores, or mixed with the baked stems and leaves or the dried and pulverized bulbs of false hellebore to be used as a poultice on the chest for heart trouble or on the arms for rheumatism. The poultice apparently burned the skin within 2 or 3 days but was sometimes left on for 2 weeks. The ripe cones were boiled and the decoction taken internally for a pain, unspecified, but possibly cancer. They also used *P. sitchensis* in a purification ritual and in some religious rituals. The Haida Indians of the Queen Charlotte Islands used *P. sitchensis* for many of the same medicinal purposes but also for childbirth and female disorders. The species also had both a natural and supernatural role in mythology and could be used as a love charm. The Coast Salish Indians of Vancouver Island probably obtained *P. sitchensis* by trading because it was not common in their area. They used the roots for basketry and making hats. They also used spruce gum when it was available for chewing, as did the Makah and Quinault tribes of Washington, for cementing tools such as harpoons and for a number of medicinal purposes. Three of the Washington tribes used warm pitch for caulking canoes.

Disease and Problems of Cultivation

P. sitchensis is susceptible to windthrow because of the shallow root system although it is more windfirm than hemlock, and to fire injury because of the relatively thin bark. Lack of available magnesium will cause die-back of the leader. Seedlings are very susceptible to drought and to shade. *Picea* is the least drought-resistant of the conifers. In nature it is attacked by several species of insects that kill or damage a large volume of timber if they reach epidemic proportions, and by several diseases although it is considered to be more free from decay than either Douglas fir or Western hemlock. In the Pacific Northwest ornamental trees are particularly susceptible to Sitka spruce gall aphid and red spider mites.

Origin of the Name

The generic name *Picea* is derived from the ancient Latin *picea* meaning pitch-pine from *pix* or *picis* meaning pitch. The specific name *sitchensis* means 'of Sitka, Alaska' honoring Sitka Island (now Baranof Island). The tree was originally discovered by Archibald Menzies on Puget Sound in 1792 and was named *Pinus menziesii* by Douglas but was previously named by the French botanist Bongard from a collection made by the German naturalist Dr. Karl Heinrich Mertens on Sitka Island in 1827. The new name was used to recognize the heavy stands in the vicinity of Sitka.

It was introduced into cultivation in the British Isles by David Douglas in 1831 although the Russians are known to have planted small groves about 1805 at Unalaska near the eastern end of the Aleutian Islands. These groves are still growing and have produced cones but young trees are absent for some reason.

Picea sitchensis is the State Tree of Alaska.

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Botanical Garden News and Notes

Board of Governors Tour Garden—During the summer the Board of Governors of U.B.C. made a tour of inspection of the latest developments and landscape construction program on the Main Botanical Garden site. A fine day enabled Garden staff to point out features of the substantially complete Rock and Alpine Scree Garden component and the British Columbia Native Garden, followed by a brief visit to the South Campus Nursery.

Summer Student Program—During the past summer the Garden was fortunate in acquiring the services of two students for a 10-week period under a British Columbia Department of Agriculture special grant. The arrangement enabled work to be accelerated on the backlog of accessioning and labelling in the nursery collections, compilation of an inventory of identified plant material in Rhododendron, Alpine and Woody collections and incorporation of accession sheets into the permanent record system.

Botanical Garden Extension Programs—Once again in 1973 the Garden offered a series of fall extension courses through the Centre for Continuing Education, taught by members of the Garden staff. A total of 109 people attended. The program was extended over that of the previous year by adding Series III to 'Gardening Through the Seasons'. This arrangement allowed for introductory, intermediate and advanced courses. Topics, covering the fall and winter season, included care and maintenance of plants in winter, planting for minimum maintenance, and greenhouse gardening. In addition, Mr. David Tarrant presented the popular series, 'Gardening for Apartment Dwellers', at the Vancouver Public Library and Horticultural Greenhouses at U.B.C. This latter course, and series I, II and III will be repeated next spring but with different lecture topics covering the spring and summer seasons.

Staff Changes—Mr. Tomomichi Sumi, best known to the staff and his many friends as Mr. Roy Sumi, retired on October 31, 1973 after 13 years with The University of British Columbia. The relatively short time Mr. Sumi spent at the University does not belie his contribution to the development and management of the Nitobe Memorial Garden. He became the chief gardener for the Nitobe Garden prior to its opening and had the opportunity to work under Mr. Mori, the landscape architect. The remarkable maturing of this garden has in large part been due to the devotion and dedication which Mr. Sumi has so carefully applied to his task of maintenance in the Garden. We wish him well in his retirement and hope he may devote more time to his excellent collection of bonsai.

On December 1, 1973 Mr. David Tarrant was appointed Education Coordinator on a half-time basis. This will enable Mr. Tarrant, while continuing his role in plant husbandry, to deal with public enquiries on horticultural matters and to manage and coordinate the series of courses on gardening offered by the U.B.C. Centre for Continuing Education. At the same time, Mr. James O'Friel accepted responsibility for the development of the planting and maintenance of the collection of plant materials in the newly initiated British Columbia Native Garden. Extensive collecting and planting is projected for 1974. On November 1, Mr. Sam Oyama assumed responsiblity for the maintenance of the Nitobe Memorial Garden.

Seed Exchange Report—The 1973 Index Seminum, produced by Mr. A. James MacPhail, reflected his interest in that fascinating segment of our flora, the alpines. The Index contained 314 taxa, representing 75 families. The publication was distributed to 504 institutions, of which 335 requested seeds. A total of 4300 packets were distributed out of a total of 7928 requests. It is obvious there were a number of seeds listed that could not always be supplied. The ten most popular taxa were: *Lewisia pygmaea* (101), *L. tweedyi* (95), *Dodecatheon conjugens* (91), *D. dentatum* (90), *Douglasia nivalis* var. *dentata* (89), *Clintonia uniflora* (87), *Lewisia triphylla* (86), *Dodecatheon jeffreyi* (85), *Primula cusickiana* (85), and *Erythronium grandiflorum* and *E. montanum,* both with 84 requests. Emphasis will continue to be placed on having indigenous British Columbia material as the basis for the seed exchange program.

Nitobe Memorial Garden—The garden continued to be one of the favourite locations on the Campus. Nearly 93,000 people visited the garden during the period March to mid-November. The Vancouver Ikebana Association provided weekly floral arrangements in the teahouse. Next year will see the contiguous development of the new Asian Center which will eventually enhance the entrance and backdrop to the Garden. Late in the year saw the retirement of Mr. Roy Sumi, his duties have been assumed by Mr. Sam Oyama.

Pacific Northwest Chapter of the Holly Society of America—The new chapter was formed in 1973 for interested holly growers in Oregon, Washington and British Columbia. Information can be obtained from Mr. W. F. Kosar, Secretary-Treasurer, 2425 NE Seavy Circle, Corvallis, Oregon 97330.

An Organic Pesticide for Aphids on Ornamentals

The common garden plant *Rheum rhaponticum* L. or 'Rhubarb' has long been known to have edible leaf petioles or stems, but poisonous leaf blades (see John M. Kingsbury, 1964, Poisonous Plants of the United States and Canada). The petioles have the acidic flavoring derived from malic acid whereas the leaf blade has citric and oxalic acids, the oxalic acid and soluble oxalates are present in sufficient quantities to be lethal.

The pesticide solution is prepared by boiling several large leaves in a gallon of water for approximately one hour. Strain solution carefully to remove all plant material. Cool and apply with an ordinary hand sprayer to aphid infected ornamental plant material. After 24 hours aphids turn red in color and soon die. There appears to be no residual effect and new infestations should be sprayed with newly prepared solution. No attempt has been made to test storage of the rhubarb solution. Sprayer equipment should be thoroughly cleaned with water after use and all excess rhubarb solution should be discarded to prevent ingestion by humans or domestic animals. Remember, you are using a natural poison.

BOTANICAL GARDEN STAFF

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Research Scientist (Cytogenetics)
Dr. Christopher J. Marchant
Research Scientist (Horticulture)
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Mr. Harold Duffill
Mr. Leonard Gibbs
Mr. Sam Oyama
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Mr. Isao Watanabe
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Dr. Roy L. Taylor (Editor)
Dr. Bruce MacBryde (Associate Editor)
Mrs. Sylvia Taylor (Research Assistant)

CLIMATOLOGICAL SUMMARY FOR 1973*

A review of the weather data in 1973 shows there were no significant differences in any of the recorded categories when compared to the past 12 years' records. Minor differences which occurred reflect only variations in the normal weather pattern. Factors such as the April and July rainfalls being the lowest in the past twelve years and November the highest, or the mean monthly temperatures being lower than those in 1972 and yet generally higher than those in 1971, only show the relative seasonal stability, if sometime undesirable factors, in the local weather conditions.

The highest recorded temperature for the year was 86°F on September 5th. The last frost occurred on March 17th and the first one on November 1st. Grass minimum temperatures below 32°F occurred in eight months of the year. Total rainfall was 45.45 inches and the total snowfall for 1973 was 9.75 inches; 11.3 inches of snow fell in the winter period of 1972-73. The total hours of bright sunshine was 1824.9, an average of 5 hours per day.

Data *1973*	*October*	*November*	*December*
Mean temperature	49.6°F	39.8°F	45.6°F
Highest temperature	61.0°F	55.0°F	55.0°F
Lowest temperature	38.0°F	29.0°F	26.0°F
Grass minimum temperature	25.0°F	21.0°F	17.0°F
Total rainfall/No. days with rainfall	5.21″/20	9.02″/25	9.54″/22
Total snowfall/No. days with snowfall	nil	6.05″/4	0.5″/1
Total hours bright sunshine/possible	78.9/318.43	42.8/268.33	40.4/253.11
Max. wind speed (m.p.h.) 1 hour/direction	14/NW	16/SE & N	18/SE & N
Mean mileage of wind at 3′	72.4	88.0	86.4
Mean mileage of wind at 40′	110.9	131.2	131.2

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

DAVIDSONIA

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