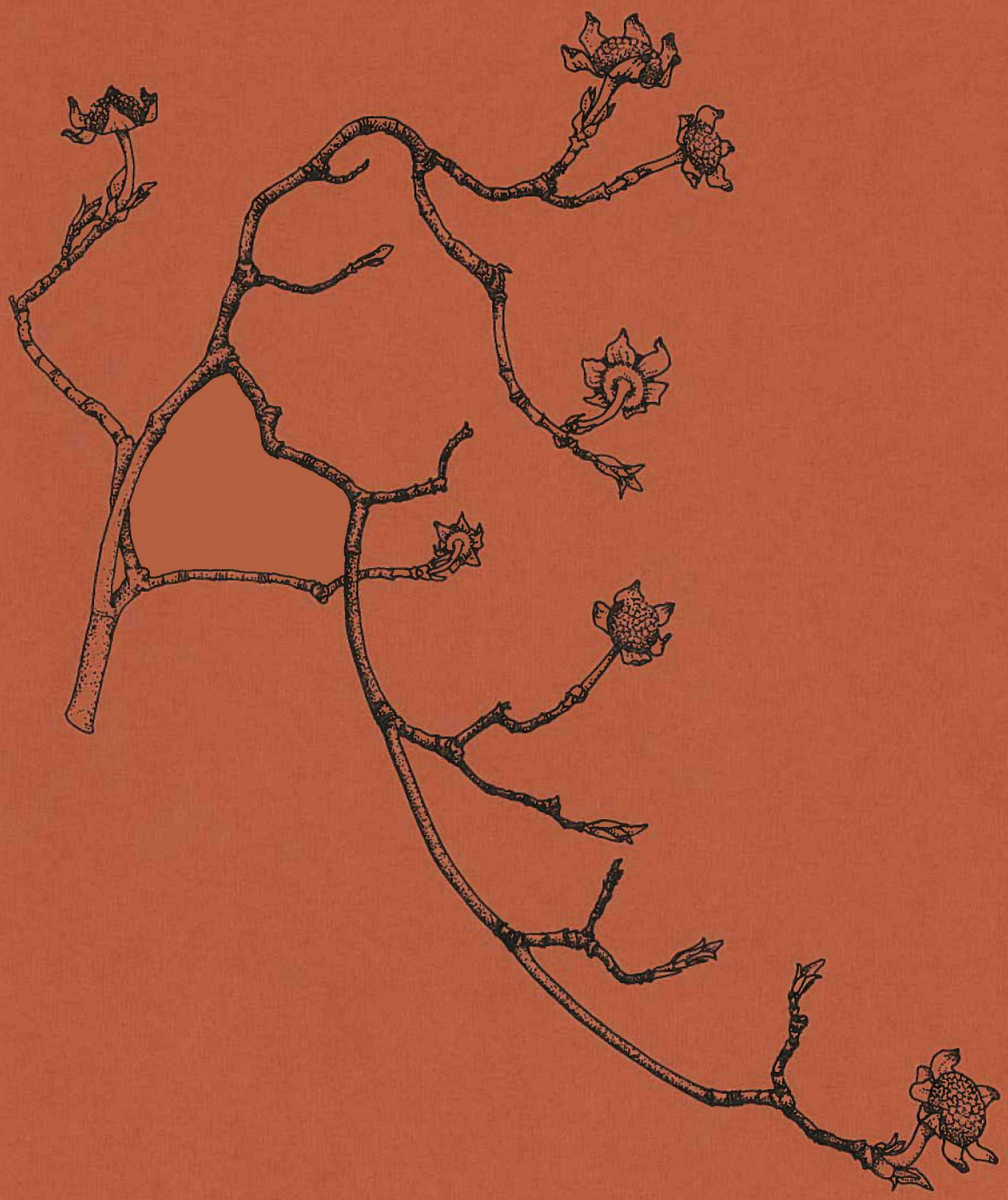
DAVIDSONIA

VOLUME 1 NUMBER 1 *Spring 1970*



Cover

The winter condition of *Cornus nuttallii*, the floral emblem of the Province of British Columbia. The flowering buds are normally produced at the end of the growing season and remain in this condition until early spring when the prominent creamy-white bracts expand and the flowers open in April.

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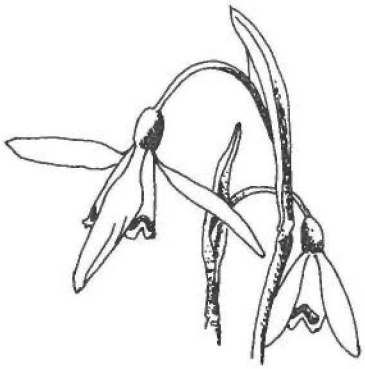
Acknowledgements

The pen and ink illustrations are by Mrs. Lesley Bohm. The photograph of Professor John Davidson was kindly loaned by the Department of Botany, University of British Columbia. Dr. John W. Neill has contributed to the material on propagation and cultivation of *Cornus nuttallii* and Mr. H. N. W. Toms of the Canada Department of Agriculture, Research Station, Vancouver, B.C. was most helpful in providing material for the discussion on the diseases of *Cornus nuttallii*. Dr. V. C. Brink of the Department of Plant Science of the University of British Columbia contributed the article on Professor Davidson.



Introduction

The appearance of 'Davidsonia' represents one of the many new steps that is being taken in the development of the newly formed Botanical Garden Department on the campus of the University of British Columbia. Although the Department was only formally organized in 1966, and the first director appointed in late 1968, the Botanical Gardens at the University date back to an original 5-acre site established in 1916. Today, we are in the midst of a new programming phase with the development of design plans for a Research-Administrative Conservatory Center and associated gardens on a new 48-acre site. A total of 78 acres now come under the direction of the Botanical Garden on the Point Grey campus. The quarterly information bulletin 'Davidsonia' fulfills a long-awaited need for a publication devoted to garden activities on the west coast of Canada. The bulletin will feature an enlarged special edition each year in the summer number giving details about one of the garden features on the campus. This year, the summer number will commemorate the 10th anniversary of the Nitobe Memorial Garden, an outstanding example of Japanese landscape architecture, that is part of the Botanical Gardens.

Gardening has long been a satisfaction to man and the Botanical Garden at the University of British Columbia hopes to continue in the long tradition of the great botanical gardens of the world in providing for all peoples a set of educational and aesthetic values build around the plants of the world. The new developments at UBC are focused on the theme 'Plants and Man'. The ever increasing urbanization, rapid population growth, and the use or misuse of our environment causes man to look inward at the green world for satisfaction and relief from the foment that threatens to engulf us if we cannot plan our role in the environment in a more rational manner than we have done in the past. The purpose of the Botanical Garden is to provide leadership in the understanding of the green world we live in and it is my hope that we may reach our goal through teaching, research and the development of a public awareness of plants in relation to man. In a more restricted sense, the Universities of the world are faced with new challenges of relating in a positive manner to the community of man. The development of widening generation gaps has produced social unrest. It is my belief that the botanical garden can provide a new window to view and enter the university community for one finds generation gaps lacking in the orderly environment provided by plants.

The Director

Professor John Davidson
1878-1970

Professor John Davidson represented the 'spirit of botany' for many years at the University and it was he who kindled the first beginning of the Botanical Garden on the campus and initiated many students to a life-long study of plants. We are particularly pleased to commemorate the work of Professor Davidson by naming our new journal after him.

The following account of Professor Davidson was written by Dr. V. C. Brink, Professor of Plant Sciences of the Faculty of Agricultural Sciences at the University of British Columbia. It forms part of a report published in the U.B.C. Chronicle, Autumn 1967.

My memories of John Davidson go back a long way. It was in the autumn of 1927 that Arthur Sovereign, an ardent mountaineer who later became Bishop of Athabaska, persuaded a group of boys to listen to Professor Davidson of the then biology department of UBC deliver his 10th address as president of the Vancouver Natural History Society on the topic 'By their fruits ye shall know them.' This sententious title would not appeal today, but it was in character with the times and the Aberdonian burr of the speaker. The appeal to us boys came from the fine hand tinted slides and the reputation of the lecturer as one of the first small group to explore the fabled natural gardens of Black Tusk Meadows and the exciting region of Garibaldi Lake.

In our imagination, stimulated by stories of volcanism, of glaciation and unsurpassed mountain scenery, the Garibaldi region lay largely unexplored and beckoning just beyond the rim of the North Shore mountains. Around this time interest in designating the Garibaldi Lake area as provincial park had reached a climax. Members of the legislature, many organizations such as the B.C. Mountaineering Club and many leading citizens, such as Chris Spencer, Harold Graves, Dr. Fred C. Bell, Colonel (later General) W. W. Foster, J. Weart and T. Price, enthusiastically supported the concept. To a large extent credit for the creation of the park must go to John Davidson for his recognition and documentation of its unique features.

Invitations to take part in field trips were issued on the evening of Professor Davidson's 10th presidential address, and soon under his leadership some of us were exploring the land of British

Columbia, its flora and associated natural features, from saltmarsh to mountain meadow. Roads were poor, trails were often dim and difficult, hikers were scarce and skiers scarcely existed.

Later as students at UBC in the early thirties we listened to the dreadful Davidson puns and to his fine distinctions between sage and sagebrush, earthworms and roundworms, between *Dalea* and *Dahlia*. Not until later, at graduate school, did some of us realize that the biological teaching at UBC which John Davidson shared with Andrew Hutchison, McLean Fraser, Frank Dickson, George Spencer and a few notable assistants was not surpassed in quality and content on this continent.

It might be said that John Davidson was the first person appointed 'for The University of British Columbia,' for he was invited, in 1911, by the provincial government to serve as 'provincial botanist.' In mind at the time was the creation of a provincial university and it was the government's intention that the new botanist would serve a new university. Davidson's appointment predates those of the first Board of Governors and of President Wesbrook. His appointment to the University as 'instructor' in botany came in 1917.

John Davidson was born in 1878 in Aberdeen, Scotland and graduated from Gordon's College in that city. As botany assistant and later curator of the Botany Museum at the University of Aberdeen from 1893 to 1911 he gained an excellent background in plant classification and general biology. He could scarcely have been prepared however for the thin settlement, the large areas of terra incognita and the rugged terrain which were no minor obstacles in the way of botanical exploration of B.C. in 1911.

Exploration it was, for his botanical survey of Savary Island was made when it was in a primeval state; he was with the first party to follow Cypress Creek in West Vancouver to its source lake and to give Hollyburn Ridge in the same municipality its name. In 1912 with eight others he mapped and explored botanically the Garibaldi Lake area, and, without a shred of doubt, was one of the first human beings, not excluding Indians, to tread its heath and view its flower meadows.

Two years later he was eliciting information on plants used by the Indians of the Dry Interior for food, dyes, and for shelter, and giving the Indian names their scientific equivalents. This task, carried out with great care, took him to the headwaters of Botahnie (not a cognate of 'botany'), Skonkon and Twaal creeks in the lower Cariboo. An early, well-known ethnologist, Tait, who did much to record the language of the Interior Indian groups, aided him. In 1915 Davidson proceeded with botanical surveys of Skagit and Tulameen river basins and covered much of the area we include today in Manning Park.

His appointment to the University in 1917 left him less time for botanical surveys. In the following years until his retirement in 1943 thousands of students 'had him' in biology and botany lectures and laboratories and some who recall his finely executed blackboard illustrations will regret the passing of this art in biological teaching.

Teaching responsibility, in Professor Davidson's mind, took the teacher out of the classroom. It is not surprising, therefore, that he was founder and, until 1937, president of the Vancouver Natural History Society, secretary of a youthful B.C. Academy of Science, onetime secretary and president of the Vancouver Institute and that he was also deeply interested and active in many other cultural organizations in our province. First, last and always, though, he was a botanist.

John Davidson's early association with botanical gardens in 'the old land,' his associations in later years as a UBC professor with Kew Gardens in England, and his appreciation of our favourable climate, led him to urge the establishment of a UBC botanical garden. His garden, first developed at Colony Farm in 1912, was successfully transferred to the Point Grey campus in 1916.

Professor Davidson is survived by three children, two of them graduates of UBC. His namesake is professor of botany at the University of Nebraska. A daughter, Jean, a fine botanist in her own right, is the wife of Dr. C. A. Arnold, professor of paleobotany at the University of Michigan, Ann Arbor. A second daughter, Flora (Mrs. Douglas Bell), lives in Luseland, Saskatchewan.

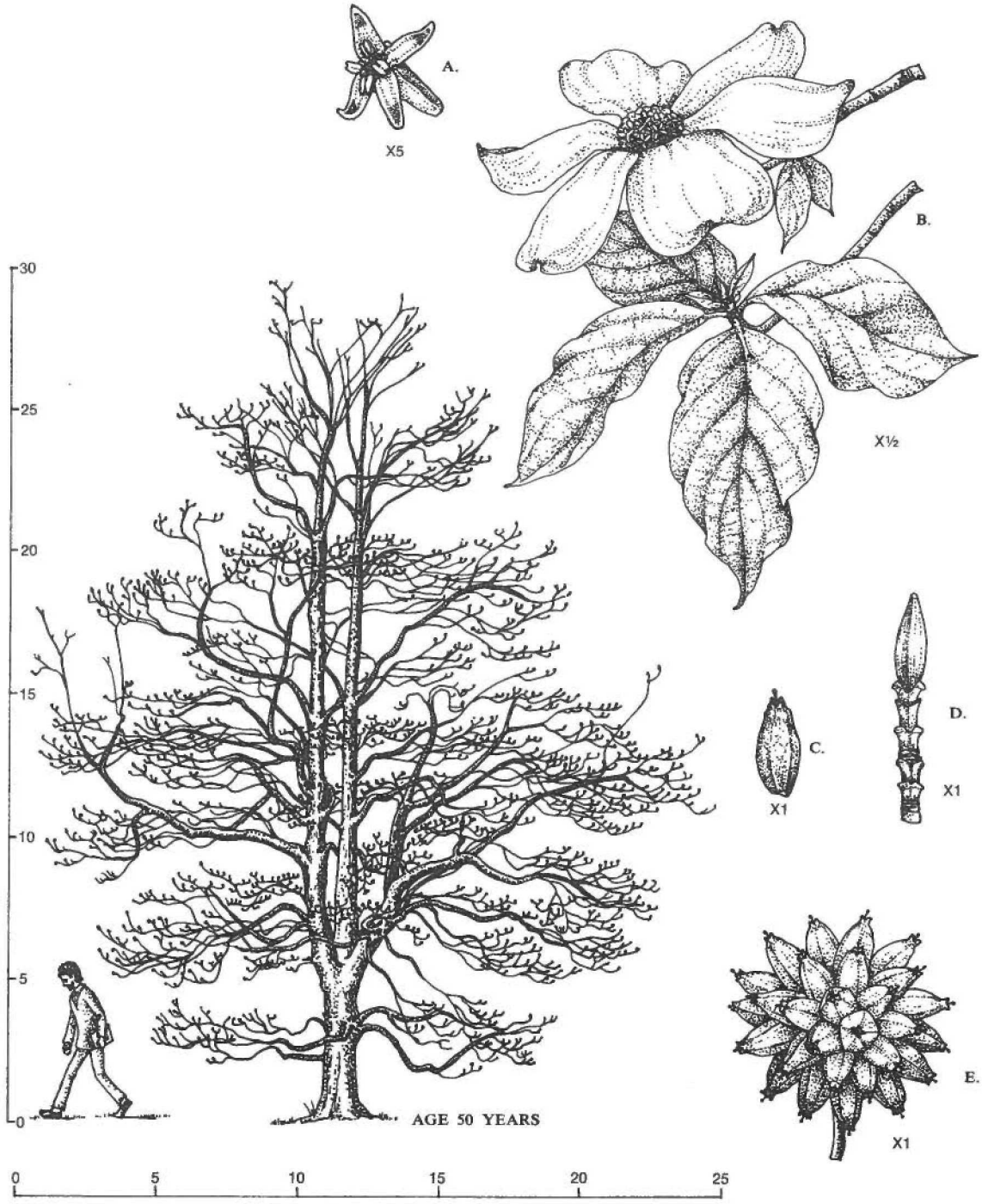


FIGURE 1. A. individual flower, B. habit of flower, C. individual fruit, D. dormant vegetative bud, E. fruit cluster.

Cornus nuttallii Aud. ex Torrey & Gray

'PACIFIC *or* WESTERN FLOWERING DOGWOOD'

Member of the Family Cornaceae Section Cynoxylon

Natural Distribution

Cornus nuttallii occurs from southern British Columbia to California along the western slope of the Cascade Mountains. An isolated population is found in northern Idaho. In British Columbia the Western flowering dogwood is found only in the lower mainland portion of the southwestern region of the province and on the southern portion of Vancouver Island and adjacent islands.

Habitat

This species is found in the coastal Douglas-fir and drier coastal Western hemlock zones. The precipitation in these zones varies from 66-280 cm (Krajina 1969). Trees are often found along streams in the southern portion of its range whereas in the more northern range it is often in open to partially open dense forest below 6,000 ft. It is well adapted to moist loam soils with adequate humus and a fairly low pH of from 5.5 to 6.0. It is not well-adapted to heavy soils and appears to grow best on acid or neutral soils. Although the species is widely distributed, it is usually found only in localized stands.

Description

A tree or shrub, 6-13 m in height with a DBH of 17-45 cm. Trees are usually obconic or with a rounded crown. If the tree is growing in a dense forest, it usually possesses a long and tapering trunk supporting a thin and narrow crown. The lower portion of the trunk is devoid of branches. In open habitats, the tree develops into a well-branched form with a narrow crown that is somewhat rounded or conical with age. Trees assume a bushy habit with several main leaders, when damaged or pruned in early stages of growth. Such trees or shrubs are usually 2.5-4 m in height.

The root system of *C. nuttallii* is spreading and somewhat shallow in most coastal forest zones.

The bark is smooth, thin and grey when young, but becomes brown and scaly with age, particularly in poorly growing trees. The bark often has a checkered appearance in maturity.

Twigs are green when first developed, but soon become dark red or almost black with maturity. Pith is brown. Twigs always bear a terminal bud.

Buds consist of small acute bud scales enclosed within two light green, long and narrow opposite scales.

Mature leaves are ovate to obovate, short acuminate, with a cuneate base. Leaves are glaucous with strigose or pilose appressed pubescence on the lower surface and often slightly strigose pubescent on the upper surface. Leaves are 5-12 cm long and 3-7 cm broad. Venation is pinnate from a prominent midvein. Veins are always depressed on the upper surface of the leaf. Leaves may turn deep orange or vermillion in the fall. Petioles are from 0.5 to 1 cm long.

Wood is fine-grained, heavy, hard and strong.

Flowers are born either in the spring or late summer or autumn. Autumn flowering may result from wet summer conditions, but it is known that some trees predictibly flower more regularly in the fall than in the spring. Flowers produced in the autumn are more variable with respect to the number and shape of bracts. Trees that flower heavily in the autumn usually have a subsequent decreased flower production in the spring.

Inflorescence is a congested cyme. Bracts are obvious and petalloid, white or tinged pink, 4-7 in number with the most common number being six. Bracts are 4-6 cm long, 3-6 cm broad, linear-veined, generally obovate with a tapering base and short-acuminate tipped. Flowers are yellowish-green, about 75 crowded into a cluster about 2 cm in diameter, the cluster surrounded by the prominent bracts. Calyx 2.5 mm long, petals 4 mm long and black-tipped. Stamens four.

Fruit a cluster of 20-40 dark red drupes in a cluster 2.5 to 3 cm in diameter. Drupes 1-1.5 cm long, about half as thick, more or less ellipsoidal but usually prismatic by mutual pressure. Calyx and styles persistent.

Excerpted from DAVIDSONIA, Volume 1, No. 1, Spring 1970.

Propagation

Most material is grown from seeds. Seeds normally ripen in August or early September and may be stratified any time after maturity. Seeds not stratified usually do not germinate until the second year after planting. To promote germination, wash off outer pulp, immerse in water and discard those seeds that float. Stratify seeds in moist sand or peat moss at 32 to 40°F for 6 to 18 weeks prior to sowing. Seedlings should be grown in containers to permit easy transplantation.

Cuttings may be taken from vigorous young growth and rooted in a closed propagation case. In general, however, best propagation results have been obtained from the production of seedlings.

Transplantation

Best results are obtained by using container grown material and transplanting in the late spring, or just before the plants begin to leaf. Small trees can be transplanted at anytime during the dormant period. Trees obtained from natural stands are difficult to move successfully, but can be done if small trees are chosen. Trees are usually slow to establish after transplantation.

Conditions for cultivation

Trees are relatively slow growing, becoming 6-12 inches in diameter in 50-100 years. Large trees are from 125-150 years in age. The recommended hardiness zone for *Cornus nuttallii* in Canada is Zone 8 (Sherk and Buckley 1968). In colder zones, trees have to be grown in large tubs and put into a cold storage during the winter months. Trees are best planted where some shade is provided for the lower portion of the trunk and roots. The thin bark of younger trees does not stand up well to full exposure of the sun and should be protected by planting other shrubs nearby to filter the light onto the trunk. It can be successfully grown in the open providing the lower branches are retained to provide shade for the lower trunk and roots. Although the tree likes a moist and well-drained soil, it does not need additional watering during the dry summer period.

Landscape value

Trees provide medium shade, and are attractive ornamental subjects in a garden as shrub borders, woodland plantings or specimen trees. The large white or pink-tinged bracts and the bright red clusters of fruit provide an attractive contrast with the foliage in spring or fall. Trees are quite resistant to wind and have not been affected in the Vancouver area by gale force winds. No specimens were observed uprooted by typhoon Freda in 1963 (personal communication J. W. Neill). *Cornus nuttallii* is used sparingly as a street tree in British Columbia.

Availability

This species is only moderately available in British Columbia from local nurseries because of lack of demand and the high percentage of loss in propagation.

Ornamental cultivars

Two cultivars have been developed locally. A variegated strain registered as *C. nuttallii* cv. *Eddii* with normal flowers but possessing a yellow variegated leaf. 'White Wonder,' a cross between *C. nuttallii* and *C. florida,* has the characters of both but a better autumn foliage, and is hardier than *C. nuttallii.* Both of these cultivars were developed by H. M. Eddie and Sons Nursery Limited of Vancouver.

Other uses

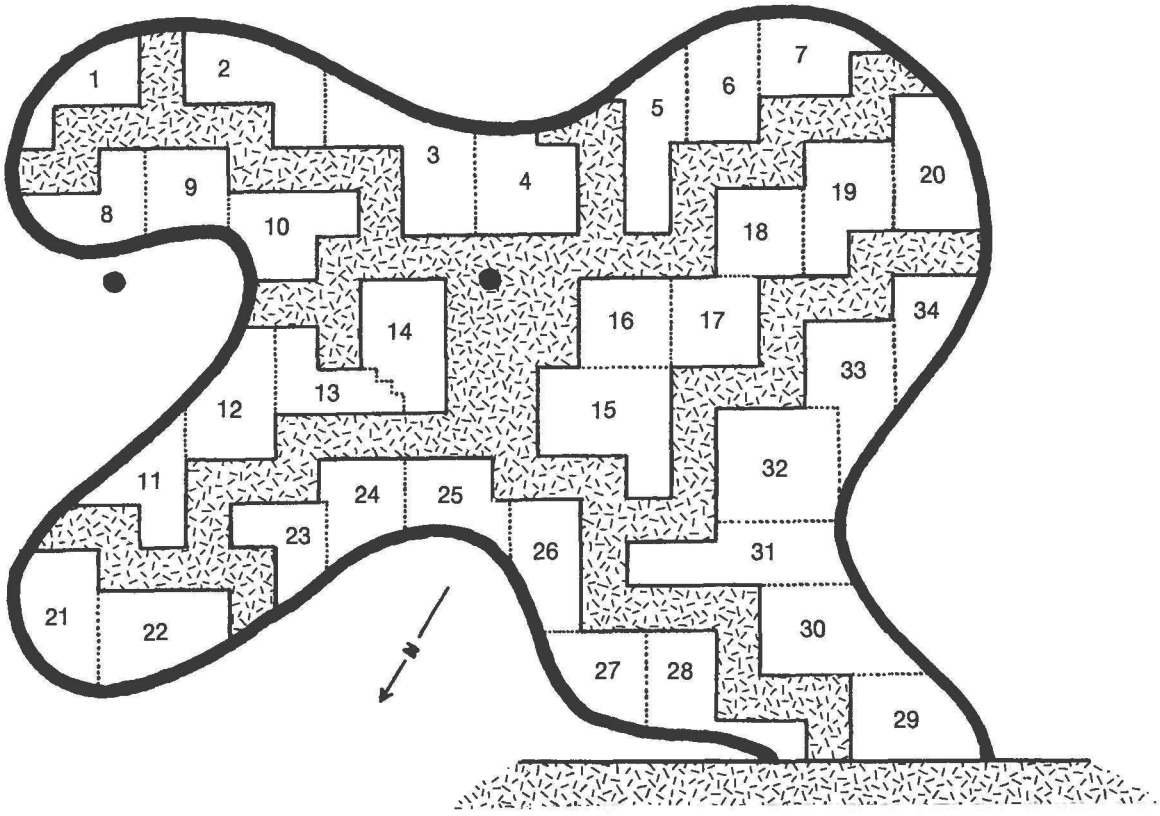
The fine grained wood is heavy, hard and strong and is used for the production of golf clubheads, brush heads and engraver's blocks. Indian tribes of the Pacific Northwest used the roots to produce a scarlet dye.

Diseases and problems of cultivation

Trees are very susceptible to sun damage in the winter months. The result of such damage is a checkering of the bark and cold damage to the growing tissues. Trees which have been severely damaged will show a slow decline in growth and development of secondary fungal infections leading to the death of the tree within one or two seasons. Much injury can be prevented by proper attention to propagation requirements and avoidance of wounding of the trunk by maintenance machinery. *(Continued on page 8)*

Rose Garden – 1970 Renovations

This garden was established in 1959 near the Faculty Club. This past year, the upper bed was completely renovated. A planting plan and list of varieties is provided. Labels in the garden indicate name of variety, botanical origin, UBC Botanical Garden accession number and year of accession, and code number of supplier. The 1970 All American Rose 'First Prize' is located in bed number 27.



Bed No.	*Variety*	*Accession No.*	*No. of Plants*	*Bed No.*	*Variety*	*Accession No.*	*No. of Plants*
1	Miss All-American Beauty	523-054-69	17	18	Confidence	551-054-69	16
2	Bob Hope	542-054-69	22	19	Prima Ballerina	550-054-69	20
3	Gruss Au Berlin	541-054-69	26	20	Fee	559-054-69	26
4	Korona	528-054-69	20	21	Silver Star	546-054-69	24
5	Charleston	527-054-69	23	22	Angel Face	531-054-69	24
6	Polynesian Sunset	526-054-69	18	23	City of Leeds	534-054-69	18
7	Colour Wonder	940-054-69	17	24	Europeana	532-054-69	19
8	Scarlet Knight	556-054-69	20	25	Orangeade	524-054-69	20
9	Ernest H. Morse	543-054-69	17	26	Granada	547-054-69	19
10	Fragrant Cloud	544-054-69	20	27	First Prize	548-054-69	22
11	Copper Delight	530-054-69	16	28	Pascali	549-054-69	25
12	Gene Boerner	529-054-69	18	29	Little Darling	537-054-69	23
13	Reg Willis	558-054-69	19	30	Bewitched	554-054-69	22
14	Matterhorn	545-054-69	21	31	Violet Carson	538-054-69	23
15	Brasilia	553-054-69	24	32	Comanche	557-054-69	25
16	Camelot	555-054-69	20	33	Nearly Wild	536-054-69	22
17	Grandpa Dickson	552-054-69	16	34	Iceberg	535-054-69	18

Botanical Garden News and Notes

Alpine Garden Club of British Columbia Project—This program initiated in 1969 has been continued this year. Club members are participating in the selection and growing of alpine material for the new proposed alpine-scree gardens to be developed in the main gardens. Good progress has been reported by the members growing material obtained from the seed exchange program offered by the Botanical Garden.

Rhododendron Species—A recent inventory of the Rhododendron species now under cultivation at the University of British Columbia shows 326 species. The Garden is participating in a co-operative program with both the Rhododendron Species Foundation and the Pacific Rhododendron Society in establishing an important collection of species material from Great Britain. The mild winter augments well for an excellent show of bloom this spring with some of the early varieties in flower in mid-March.

New Appointment: The Garden is pleased to announce the appointment of Dr. Christopher J. Marchant, formerly with the Jodrell Laboratory of the Royal Botanic Gardens at Kew, as our first Research Scientist. Dr. Marchant brings with him a wealth of experience in the research field of cytogenetics as well as a strong interest in ornamental plants.

CLIMATOLOGICAL SUMMARY*

Data	*December*	*January*	*February*
Mean temperature	42.05°F	38.45°F	43.1°F
Highest temperature	53.0°F	51.0°F	54.0°F
Lowest temperature	33.0°F	26.0°F	33.0°F
Grass minimum temperature	26.0°F	16.0°F	24.0°F
Total rainfall/No. days with rainfall	6.96"/25	4.23"/18	2.48"/11
Total snowfall/No. days with snowfall	NIL	4.5"/2	NIL
Total hours bright sunshine/possible	26.5/253.2	50.3/265.65	121.6/278.4
Mean mileage of wind at 3'	71.3	69.0	69.4
Mean mileage of wind at 40'	111.2	105.3	104.9

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

Cornus nuttallii, continued from page 6

The following diseases have been reported on *C. nuttallii* in southern British Columbia (H. N. W. Toms, Canada Department of Agriculture).

1. *Botryotinia fuckeliana*—'Bark canker'
2. *Gloeosporium* sp.—'Blossom blight'
3. *Monolinia corni*—'Leaf or flower blight or blast'. Not very serious and does appear to spread rapidly.
4. *Phoma* sp.—'Twig blight'
5. *Phyllactinia guttata*—'Powdery mildew'
6. *Phytophthora cactorum*—'Crown rot, Trunk canker'. This fungus enters the tree through injured areas, particularly bark injuries caused by sun scald, winter frost, or machinery damage. Infected portions of the tree should be removed if possible.

Cornus nuttallii was adopted as the official floral emblem of British Columbia in 1956.

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At the Beginning

In 1911, the Minister of Education of the Provincial Government of British Columbia authorized the inauguration of a Botanical Survey of the Province. In June, Professor John Davidson was appointed as the Provincial Botanist and the Provincial Botanical Office was established in the City of Vancouver. In 1912, two acres of land was set aside at the Provincial Colony Farm, Essondale, for the purpose of providing a nucleus for a Botanical Garden. The aims of the Botanical Garden were: (1) To assemble a representative collection of plants from all parts of the Province, (2) To grow sets of species belonging to 'critical' genera for study and research, to determine accurately their species and apply their valid names, and (3) To create an outdoor museum to provide living material for teaching, and a source of supplies for undergraduate laboratory work, as well as for post graduate research. In 1914, the Botanical Office, Survey, Herbarium, Library and Garden collection were turned over to the University. In 1916, the collections at Essondale numbering between 20,000 and 30,000 were transported 20 miles to a permanent 5-acre site at the University.

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Contents

Introduction 1

Professor John Davidson 1878-1970 2

Cornus nuttallii 'Pacific or Western flowering dogwood' 4

Rose Garden—1970 Renovations 7

Botanical Garden News and Notes 8

Climatological Summary 8