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KEY TO THE DECIDUOUS WOODY PLANTS  
OF NORTHWESTERN OREGON  
IN WINTER

by

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KEY TO THE DECIDUOUS WOODY PLANTS OF NORTHWESTERN OREGON  
IN WINTER

INTRODUCTION

This key and illustrated descriptions are designed for identification of native trees and shrubs of northwestern Oregon in winter condition. Whenever possible without impairing efficiency of the key, characters applicable at all times of the year have been used so that it can be utilized, also, in identifying plants in leaf. A minimum of technical terms has been employed; and no special equipment is required except a pocket knife and, though not a necessity, a small hand lens.

All native deciduous trees and shrubs and common escapes from cultivation are included, plus some tardily deciduous species, normally evergreen but behaving as deciduous plants during an unusually cold winter. In all, seventy five species, representing thirty-four genera of seventeen families, are covered, with keys to all species which can be separated by definite winter characters. In several genera, notably Salix and Rosa, species are difficult to separate even by using leaves and flowers, hybridization being common and producing intermediate forms. Because of the intergrading characters and the doubtful species limits, no separation is here attempted for Salix.



## Limits of the Area and Vegetational Distribution

The area covered by this key lies between the crest of the Cascades and the Pacific Ocean, extending from the Columbia River south to the Umpqua Divide in southern Lane County. The general climate is maritime. These boundaries plus the intrusion of the Coast Range roughly divide the region topographically and climatically into four sub-areas which represent extreme delimitations of certain species; of others, merely modifying their relative abundance.

The narrow coastal strip along the western margin of the area is subjected to direct maritime influences of salinity and wind, and receives the heaviest rainfall. Its woody plants, angiosperms as well as gymnosperms, are preponderantly evergreen. Inland lies the Coast Range, which throughout its extent does not attain great altitude, its highest point, Mary's Peak, rising only 4,097 feet. This range is chiefly a coniferous area, its deciduous trees, mainly Alnus rubra, Acer macrophyllum and Fraxinus oregana, being confined largely to river or creek valleys. The bare upper slopes of the higher peaks, however, notably Mary's Peak and Saddle Mountain in Clatsop County, offer habitats for species which approach subalpine characters and which, in a few instances, are narrowly endemic. Cladothamnus pyrolaeiflorus, the copper rhododendron, in Oregon as far as is known, is restricted to Saddle

Mountain, and is rare northward.

East of the Coast Range lies the broad Willamette River Vally, an area considerably less humid than the other three regions. Deciduous vegetation is well developed, but among the woody species are no known endemics. Native vegetation has been disturbed and a number of cultivated plants have become well and as widely established as the native plants. The eastern edge of the Willamette Vally merges into the slopes of the Cascades. Though this area is more humid than the Willamette Vally, rainfall is less heavy than in the Coast Range; consequently, the forests are more open, and shrub development is considerable. Elevation reaches over 11,000 feet, creating a variety of conditions. The total number of deciduous species is large but with no known woody endemics.

On certain isolated peaks scattered through the region and within the Calapooya-Umpqua Divide, which forms its southern boundary, an overlapping of typical northern, southern, eastern and western floras has been recorded in recent studies by Drs. W.H. Baker (3), and A.L. Aller (2), resulting in wide variations in former range tables and in unusual combinations of the species in question.

## Morphology of the Twig

### Buds

Buds are incipient shoots containing elements for the next spring's growth. Essentially, a bud is a shoot with unelongated internodes and, if it is a vegetative bud, leaf rudiments; floral rudiments, if a flower bud; or both, if a mixed bud. Normally, buds are terminal, or lateral in the axils of leaves; in winter, they are located above the leaf scars on deciduous trees and shrubs. These buds were formed at the time of shoot elongation the preceding spring and will lie dormant until the coming spring.

The buds of most woody plants have a scaly covering consisting of modified leaves or leaf parts. These are generally firmer than ordinary leaf structures, and are typically brown or brightly colored, protecting the bud from mechanical injury, desiccation or sudden temperature change in winter. Morphologically, scales are not all of the same origin. In Ribes, most of our native Rosaceous plants, and our species of Acer, bud scales are petioles, frequently bearing leaf-blade rudiments, or their scars, at the tip. Stipular bud scales were found in the native species of Ceanothus. The scales of Alnus are entire leaf blades, still retaining their identity though greatly modified in texture. There is often a transition in a bud from outer through inner scales to unmodified leaves.



This is illustrated especially well by Acer macrophyllum as the buds are opening in the spring.

Bud scales retain the arrangement of the leaf parts from which they originated. If the leaves are opposite, the scales are opposite; or if spiral, the scales are correspondingly spiral. The extreme shortening of the internodes of a bud often disguises the true arrangement of the bud scales, as in Vaccinium, where without careful examination the two outer scales appear opposite, although the true arrangement is displayed by the inner scales.

A bud scale never develops into a foliage leaf. When the leaves expand, the scales are generally deciduous, leaving an area of closely-set linear scale scars to mark the beginning of the season's growth. In some species, bud scales persist as a torn, ragged collar at the base of each season's growth until they weather away.

Bud scales are not always present. The leaf elements of some species are often protected only by a dense covering of pubescence; others have poorly formed scales. Our native species of the family Rhamnaceae present a series of transitional stages from naked to scaled buds. In the buds of Rhamnus purshiana, the internodes are partially elongated, the lower leaf rudiments slightly expanded, and unprotected by any type of scale, protection consisting rather of modification of the leaf surface. Stipules are deciduous in the bud or sometimes shortly after. The internodes of

Ceanothus integerrimus are not expanded, the leaf rudiments being packed closely together in a definitely bud-like structure. Stipules are persistent, the lowest pairs enlarged, lanceolate and papery in texture, standing erect around the bud. In Ceanothus sanguineus, the stipules are further modified, becoming broad, scale-like in texture, and closely applied to the bud, completely covering it.

Since bud scales generally are modified leaves or petioles, primitively they have buds in their axils. This character has been retained by the native Rubus, Acer, Sambucus and other genera. Sizable buds are found also in the axils of the rudimentary leaves of Rhamnus purshiana.

Typically, no branch forms at a node of a woody plant until the season after formation of the shoot bearing that node; however, frequently in Rhamnus purshiana and atypically in other species, a shoot will branch during the same season as its development. Another peculiar condition found in Rhamnus purshiana is the occasional development of a branch from the terminal bud, which normally produces only shoot and leaves, branches typically originating the second season from buds in the axils of the leaves. The branches arising directly from rudiments in the terminal bud are not always subtended by a leaf scar. This is rarely if ever encountered in any other species of our area.

Terminal buds are occasionally absent. In Salix,

Vaccinium and Acer circinatum indeterminate growth is the rule, while in Sambucus, frequently in Rubus and others, the shoot usually dies back to the preceding node. If the plant has alternate leaves, the nearest lateral bud tends to produce a long upright shoot such as would be produced by a terminal bud; or if the leaves are opposite, the two buds at the nearest node typically take over the function of the terminal bud.

Generally, buds are single at a node, but accessory or supernumary buds are characteristic of several genera. They may be superposed, as in Rubus or Sambucus caerulea, with one bud above another, or laterally multiple, as in Sambucus racemosa, with a large central bud. Rarely both laterally multiple and superposed buds are formed as occasionally is seen in Sambucus racemosa.

### Leaf Scars

Leaf scars are left at the point of disarticulation of the leaf petiole. Where a definite abscission layer has been formed, a clean definite scar results. If the abscission layer is incomplete, the leaf scar is torn or indistinct. In a number of groups a secondary abscission layer forms, leaving a small cap consisting of the lower portion of the petiole base, on the leaf scar. The primary abscission layer is formed just above the petiole base, the leaf falling from this point, and the secondary layer forms



at the base of the petiole (8). This condition may be detected by inserting the blade of a scalpel behind the raised leaf scar and pushing sharply. If a second layer has formed, the petiole cap will snap off at this point, leaving a clean scar with the bundle trace scars clearly visible. If a petiole cap is present, the bundle trace scars are usually difficult to see, and the cap is demarcated from the shoot by a line or constriction and a difference in color. Petiole caps are characteristic of most species of Cornus and occur in our species of Euonymus, Acer, Viburnum, Vaccinium and Ceanothus, having a special tendency to occur only at the uppermost leaf-scars in some species. Often Crataegus, and possibly also Prunus, forms a less definite secondary abscission layer.

On the surface of the leaf scar appear one to many bundle trace scars where the traces were separated when the leaf fell. Often they are obscured by a corky growth over the surface of the leaf scar or by shriveling of the leaf scar, but they may easily be seen if a thin slice is taken from the surface of the scar. Care must be taken not to section too deeply into the complicated vascular structure of the stem.

#### Phyllotaxy

The arrangement of leaves, and consequently of leaf scars on the twigs, is known as phyllotaxy. It is constant

for each species and usually the same for all species of a genus. The phyllotaxy of our opposite leaved plants is uniformly decussate, the plane of each pair being at right angles to the plane of the pair immediately above or below, bringing the leaf scars into four vertical ranks.

Alternate leaves are said to be arranged spirally. A line drawn from one leaf scar to those successively above or below, will spiral around the stem, any two successive leaf scars being separated from each other by an equal portion of the circumference of the stem. This is not always obvious, since most stems twist to some degree while growing. The two-ranked arrangement most widely distributes the leaves, the second leaf scar being on the opposite side of the stem from the first, the third directly in line with the first. In this case, the phyllotaxy is written as  $1/2$ , expressing the angle or portion of the circumference between two successive leaf scars. Also, the numerator equals the number of turns made around the stem by one cycle of leaf scars, one turn in this case; while the denominator is the number of leaf scars in each cycle or the number of ranks (6, 67). No woody plants in our area naturally have this two-ranked arrangement, but the horizontal branches of Corylus, apparently by twisting of the stem to obtain full benefit of the sun on its foliage, assume an essentially two-ranked position. Alnus is three-ranked, one cycle of leaf scars containing three members

and making one turn around the stem, the phyllotaxy being expressed as  $1/3$ . The most common arrangement is five-ranked, each cycle containing five members making two complete turns around the stem, the phyllotaxy thus being expressed as  $2/5$ . The angle between any two successive leaf scars is  $2/5$  the circumference of the stem, and the sixth leaf scar is in line with the first.

### Shape of the Pith

The cross-sectional shape of the pith is determined by the bundle traces projecting into the pith. If a single trace is given off to each leaf the x-section of the pith corresponds with the phyllotaxy,  $1/2$  phyllotaxy resulting in an oval pith,  $1/3$  in a three lobed pith as in Alnus, and  $2/5$  in a five angled pith. If the number of traces running to each leaf is more than one, the lobing of the pith is obscured (4, 153).



KEY TO THE DECIDUOUS WOODY PLANTS OF NORTHWESTERN OREGON  
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I. Leaf scars alternate



A. Buds naked

Bundle trace scars 5; leaf scars broadly V- to U-  
shaped ----- Rhus diversiloba

Bundle trace scars 3; leaf scars rounded -----  
Rhamnus purshiana

A. Buds scaly

B. Buds conspicuously stalked; pith solid

1. Pith round----- Ceanothus

Bud scales narrow; densely pubescent leaf rudi-  
ments mostly exposed ----- C. integerrimus

Bud scales broad; completely covering bud -----  
C. sanguineus

1. Pith 3-armed or 3-angled ----- Alnus

2. Buds dull red; flowers opening during winter on  
preceding season's growth; fruiting peduncles  
shorter than cones; bark smooth, gray

Old leaves with revolute margins ---- A. rubra

Old leaves with plane margins - A. rhombifolia

2. Buds dull purple; flowers opening with leaves on  
spring growth; fruiting peduncles longer than  
cones; bark scaly, brown ----- A. sinuata

B. Buds sessile; or if short-stalked, pith with

spongy cavities on drying

- C. Lowermost bud scale directly over leaf scar; distinctive odor of Salicaceae



1. Bud scale single ----- Salix

1. Bud scales several ----- Populus

Buds over 1/2 inch, resinous and fragrant

P. trichocarpa

Buds under 1/2 inch, scarcely resinous --

P. tremuloides

- C. Lowermost bud scale lateral over leaf scar



- D. Buds globose, sessile; scales papery brown, appearing two-ranked on horizontal branches ----

Corylus californica

- D. Buds not as above; never appearing two-ranked

- E. Bundle trace scars many (more than 7)

1. Bundle trace scars in a single series; low densely spiny half-shrub-Oplopanax horridum

1. Bundle trace scars obscure, grouped; typically arborescent ----- Quercus

Bud scales glabrate ----- Q. kelloggii

Bud scales downy ----- Q. garryana

- E. Bundle trace scars 7 or fewer, sometimes indistinguishable on shriveled leaf scars

- F. Bundle trace scar one

1. Terminal bud typically present; leaf

scars exfoliating on older portions, leaving only bundle trace scars

Exposed bud scales two; leaf scar torn;

bundle trace projecting -----

Cladothamnus pyrolaeiflorus

Exposed bud scales several; leaf scars

clean; bundle trace flush with surface -

Menziesia ferruginea

1. Terminal bud typically lacking, leaf scars persistent

2. Small petiole cap; leaf scars not sharply triangular ----- Vaccinium

a. Stem not ribbed below leaf scars

Bud scales two ----- V. caespitosum

Bud scales several

Lowermost bud scales saccate at

base ----- V. occidentale

Lowermost bud scale not saccate at

base ----- V. uliginosum

a. Stems ribbed or winged below leaf scar

Leaf scars transversely oval or reniform ----- V. myrtillus

Leaf scars more nearly crescent-shaped

Buds flattened at tips





Stems green, buds bright red;

low altitudes - V. parvifolium

Stems and buds dull red or pale;

above 3,000 -- V. membranaceum

Buds not flattened at tips



Prostrate, high Cascades -----

V. deliciosum

Erect, coast and low mountains-

V. ovalifolium

2. Without petiole caps; leaf scars sharply  
triangular-----Spiraea

Buds and usually twigs puberulous ----

S. douglasii

Buds and twigs glabrous

Prostrate with ascending branches --

S. lucida

Erect ----- S. densiflora

F. Bundle trace scars more than one

G. Pith solid or chambered but without  
spongy cavities

1. Bundle trace scars 5

Leaf scars raised; twigs ribbed -----

Physocarpus capitatus

Leaf scars low; twig not ribbed -----

Sorbus

Moderate altitudes -- S. sitchensis

High altitudes ---- S. occidentalis

1. Bundle trace scars 3

2. Leaf scars shriveled on greatly raised  
permanent petiole bases ----- Rubus

a. Armed

\*Shrubs with weakly developed,  
thickened prickles-R. spectabilis

\*Brambles and vines with well de-  
veloped prickles

'Stems cylindrical or nearly so

Prostrate and creeping;

scarcely glaucous -----

R. macropetalus

Erect and trailing; con-

spicuously blue-glaucous --

R. leucodermis

'Stems 5-angled or fluted

Stems fluted, maroon -----

R. thyrsanthus

Stems merely angled, green

or dull red - R. laciniatus

a. Unarmed

Stems upright and stout -----

R. parviflorus

Stems cordlike and trailing

Bud scales pubescent -----

R. lasiococcus

Bud scales glabrous except

ciliate margins --- R. pedatus

2. Leaf scars clean and visible; petiole

bases deciduous but sometimes

leaving a cap

a. Leaf scars linear; bundle trace

scars difficult to distinguish ---

Rosa

\*Calyx lobes deciduous or nearly

so

'Fruit small pear-shaped to glo-

bose, no neck; prickles

straight needle-like, or

absent; calyx lobes completely

deciduous ----- R. gymnocarpa

'Fruit long urn-shaped; con-

tracted into a neck; prickles

stout, recurved; calyx lobes

often only partially deciduous

R. rubiginosa

\*Calyx lobes persistent

Fruit usually borne singly, not

contracted into a neck -----

R. nutkana



Fruit usually borne in corymbs

Heavy prickles absent, needle-

like prickles absent or

present ----- R. pisocarpa

Heavy and needle-like prickles

both present ---- R. durandii

a. Leaf scars broader; bundle trace  
scars obvious

b. Bud scales densely pubescent ----

Holodiscus discolor

b. Bud scales essentially glabrous

c. Lowermost bud scales greatly

swollen, fleshy at base



\*Bud scales not keeled, buds

globose or nearly so -----

Crataegus douglasii

\*Bud scales keeled, at least  
some of them

\*Stipule scars present-Prunus

Bud scales broad at tip;

buds ovoid; twigs moder-

ate ----- P. demissa

Bud scales acute at tip;

buds conical; twigs

slender -- P. emarginata

'Stipule scars absent -----

Pyrus fusca

c. Lowermost bud scales not

swollen at base

Pith chambered -----

Osmaronia cerasiformis

Pith continuous -----

Amelanchier florida

G. Pith with sponge-like cavities, at least

when dried; characteristic odor of Ribes

Ribes

1. Armed

a. Nodal spines weak and many -----

R. lacustre

a. Nodal spines 1 to 3

b. Glandular pubescence at tip; nodal  
spines mostly 3 forked

Spines slender; internodal

prickles typically absent at

maturity ----- R. lobbi

Spines stout; internodal prickles

typically present at maturity ---

R. menziesii

b. No glandular pubescence at tip;

nodal spines single, or laterals

rudimentary

R. divaricatum

## 1. Unarmed

Leaf scars large and broad, covered by  
a membrane ----- R. bracteosum

Leaf scars narrow

Margins of bud scales ciliate, not  
glandular ----- R. laxiflorum

Margins of bud scales glandular and  
often ciliate ----- R. sanguineum

R. acerifolium

## II. Leaf scars opposite



A. Vines climbing by petioles; pith twelve pointed -----

Clematis ligusticifolia

A. Trees and shrubs; or if vines, pith rounded, hollow

B. Membrane covering leaf scars

Bundle trace scars 3, not visible through membrane

Philadelphus gordonianus

Bundle trace scars many, in a U-line, visible

through membrane ----- Fraxinus oregona

B. Membrane absent

C. Leaf scars raised on permanent petiole base,  
covered by a corky growth; center of pith usually  
hollow

1. Exposed bud scales 6 to 8; buds not conspicuously  
flattened ----- Symphoricarpos

Erect shrub; twigs glabrous ----- S. albus



Low and spreading; twigs usually pubescent ---

S. mollis

1. Exposed bud scales about 4; buds flattened -----

Lonicera

Pith solid; erect shrub ----- L. involucrata

Pith hollow; vines or shrubs

Glabrous ----- L. ciliosa

Pubescent ----- L. hispidula

C. Leaf scars not greatly raised; petiole bases not  
persistent though a cap may be left; pith never  
hollow

D. Bundle trace single ----- Euonymus occidentalis

D. Bundle trace scars multiple

E. Pairs of leaf scars meeting around stem in an  
ascending point----- Acer



Exposed bud scales two ----- A. douglasii

Exposed bud scales more than two

Terminal bud usually absent; buds sub-  
tended by a fringe of long white hairs --

A. circinatum

Terminal bud usually present; buds not  
subtended by a fringe of hairs -----

A. macrophyllum

E. Pairs of leaf scars meeting around the stem in  
a straight line or a descending point



- F. Bundle trace scars 5 to 7; twigs stout with  
 large leaf scars ----- Sambucus  
 Buds diverging; upper margin of leaf scar  
 notched ----- S. caerulea  
 Buds appressed; upper margin of leaf scar  
 entire ----- S. callicarpa
- F. Bundle trace scars 3; twigs slender; leaf  
 scars narrow
- G. Terminal bud scales persistent; hairs  
 when present appressed or reflexed,  
 attached at end ----- Viburnum  
 Exposed bud scales 4 to 6 - V. ellipticum  
 Exposed bud scales 2 ---- V. pauciflorum
- G. Terminal bud scales deciduous; some hairs  
 appressed, attached at center ---- Cornus  
 Pith spongy, brown; twig red with pre-  
 dominating gray overcoating -----  
C. nuttallii  
 Pith solid, white; twigs deep lustrous  
 red ----- C. occidentalis

## SALICACEAE

Salix L. Plate I.

Willows range from prostrate creeping shrubs to trees, often with several trunks from the base. Bark smooth at first, becoming fissured with age. Twigs rough and flexible or fragmenting easily, slender or moderately so; bark astringent to taste, often brightly colored, red, yellow, purple or brown, slipping off easily in an entire cylinder; cut twigs with characteristic odor of the family. X-section round, pith 5-angled or round in older portions, white, continuous. Buds appressed, sessile, solitary with a single outer scale standing directly over the leaf scar, one inner scale, enclosing either floral or imbricated leaf rudiments. Terminal bud absent. Leaf scars alternate, narrowly C to U shaped, not greatly raised. Bundle trace scars 3. Stipule scars minute or absent. Phyllotaxy 2/5.

The species of Salix are difficult to identify even with foliage and flower parts. Winter characteristics are even less distinct. Color and degree of pubescence are most obvious but are so variable within a species that they are not reliable. Most constant characters are flower parts, found in winter by dissection of the buds. A key by Maxwell Doty based on flowers and supplemented by vegetative characteristics is found in "Handbook of Northwest



Flowering Plants" by Helen M. Gilkey

Populus L.

Trees. Bark smooth in young plants, becoming fissured with age in some species, astringent odor characteristic of the family. Pith 5-angled, continuous. Mature buds with several pairs of exposed scales, lowermost standing directly over leaf scar; floral buds larger than vegetative; terminal bud persistent, larger than laterals. Leaf scars alternate, raised, reniform or 3-lobed. Bundle-trace scars 3, often compound. Stipule scars present.

Populus trichocarpa Torr. and Gray. Cottonwood. Plate I.

Populus trichocarpa Torr. and Gray; Hook. Icon.  
Pl. 9:pl. 878. 1852.

Tree reaching 140 feet. Branches erect or tending to be so. Bark yellow-gray, deeply fissured on older trunks. Twigs slender to moderately stout, usually curved and lumpy; lustrous, brown with shades of red or orange, green on shaded sides; lenticels conspicuous, orange becoming pale, not raised, vertically elongated. Older branches gray with leaf spurs.

X-section obscurely 5-angled in new growth, becoming round.

Pith 5-angled to star shaped, white, continuous. Bark astringent, very bitter; strong odor of the family.

Buds very resinous, fragrant with a honey-like odor.

Lateral buds narrowly fusiform, acuminate,  $3/4$  inch or shorter; 4 or more scales visible, deep brown on exposed portions, lowermost scales 2 keeled, usually well developed, sometimes rudimentary and early-deciduous. Leaf rudiments small, involute, immersed in fragrant orange-brown resin filling the bud cavity. Terminal bud similar, 1 inch long, ovoid, acute, typically with 8 to 10 visible scales, the lowermost usually rudimentary and early deciduous.

Leaf scars alternate, raised, giving the twig a warty appearance, lighter color than the twig. Bundle trace scars 3, central, compound. Phyllotaxy  $2/5$ . Stipule scars prominent.

Along streams and on low ground.

Populus tremuloides Michx. Quaking aspen. Plate I.

Populus tremuloides Michx. Fl. Bor. Am. 2:243. 1803. Populus vancouveriana Trel.; Tidestr. in Piper and Beattie, Fl. N.W. Coast 118, 1915.

Small tree reaching 60 feet, straight and slender when open-grown at moderate altitudes, prostrate and shrubby at high altitudes. Branches short, irregularly bent, forming a narrow, rounded crown. Bark on trunk smooth, nearly unbroken, chalky white with black protuberances and markings.

Twigs very slender, curving, branching at nearly right angles to the stem on the illuminated side, branches from

shaded side growing toward the light. Lustrous orange-brown, glabrous, occasional minute, elliptical lentils. Older growth becoming light and chalky, neutral or tawny beneath the bloom; usually with spur branches. X-section round. Pith 5-angled, small, continuous. No pronounced odor.

Buds slightly resinous, laterals nearly 1/4 inch long, terminal slightly larger, flower buds larger than vegetative, fusiform, acute; visible scales several, lowermost directly over leaf scar, dark brown with lighter margins, entire to emarginate, sometimes bifid, glabrous, occasionally sparse white pubescence.

Leaf scars alternate, raised, reniform. Bundle trace scars 3, along upper margin of leaf scar. Phyllotaxy 2/5. On low ground, not common in this area.

#### BETULACEAE

##### Alnus Hill.

Shrubs or small trees with gray bark. Twigs 3-angled, pith 3-angled or 3-armed, continuous; buds large, solitary, mostly stalked, 3-angled, 3-scaled. Bud scales in our species morphologically leaf blades. Leaf scars alternate, raised. Bundle traces 3. Stipule scars present.

Fruit a small woody cone persistent in winter, staminate inflorescence a catkin usually opening during late winter.



Alnus rubra Bong. Red alder. Oregon alder. Plate I.

Alnus rubra Bong. Mem. Acad. St. Petersburg. VI. 2: 162. 1837, not Betula-Alnus rubra Marsh. Alnus oregona Nutt. Sylva 1:28. 1842.

Tree or shrub reaching 105 feet, typically about 30 feet.

Branches slender, drooping, crown narrow, dome-shaped.

Bark thin, smooth, light gray; lenticels elongating horizontally on young trunks, inner bark red-brown.

Twigs slender, lustrous red to dull gray, hairy toward ends; frequently strongly ribbed from leaf scars, sometimes strongly angled; numerous pale, elongated, often raised lenticels.

X-section 3-angled, wood turning red or dark when cut.

Pith 3-armed, continuous.

Buds conspicuously stalked, dark red, resinous, 3-angled, asymmetrical, smooth or sparsely pubescent, obtuse or acute, about 1/2 inch, or terminal slightly longer, stalk equaling bud in length, usually orange tinted; scales 3, unequal.

Leaf-scars alternate, reniform to three lobed, raised.

Bundle trace scars 3, central compound. Phyllotaxy 1/3.

Fruit a persistent cone 1 inch or less in length, scales thickened toward apex, peduncle shorter than cone, nutlet broader than wing. Maturing during late winter on past season's growth. Margins of old leaves revolute.

Common along streams and moist slopes.

Alnus rhombifolia Nutt. White alder.

Alnus rhombifolia Nutt. Sylva 1:33. 1842. Alnus oblongifolia Wats. Bot. Cal. 2:80. 1880, in part.

Similar to A. oregona, no known characteristics infallibly distinguishing twigs of the two species at this time. Bark smooth, pale, twigs generally more slender, buds averaging smaller, cones  $3/8$  to  $5/8$  inch long, nutlet with a narrow wing. Margins of old leaves not revolute. Along streams and on moist slopes.

Alnus sinuata (Regel) Rydb. Sitka alder. Plate I.

Alnus viridis sinuata Regel, in DC. Prod. 26:183. 1868. Alnus sinuata Rydb. Bull. Torrey Club 24:190. 1897. Alnus sitchensis Sarg. Silva N. Am. 14:61. 1902.

Shrub or small tree reaching 20 feet. Branches short, horizontal, forming open narrow crown. Bark blue-gray, inner bark red. Twigs moderate, 3-angled, orange-brown turning gray, glabrous to sparsely pubescent, glandular, gummy, numerous pale elongated lenticels. Spurs on older portions. X-section 3-angled. Pith 3-armed, turning brown on exposure to air. Buds stalked, asymmetrical, appressed, dark, often purple, resinous, glabrous to sparingly pubescent, blunt to acute;  $1/2$  inch long; lower scale short. Leaf scars alternate, prominently raised, half round to reniform. Bundle trace scars 3. Phyllotaxy  $1/3$ .

## Plate I

1. Salix lasiandra Benth. Willow.
2. Populus trichocarpa Torr. and Gray. Cottonwood.
3. Populus tremuloides Michx. Quaking aspen.
4. Alnus rubra Bong. Red alder. Oregon alder
5. Alnus sinuata (Regel) Rydb. Sitka alder.



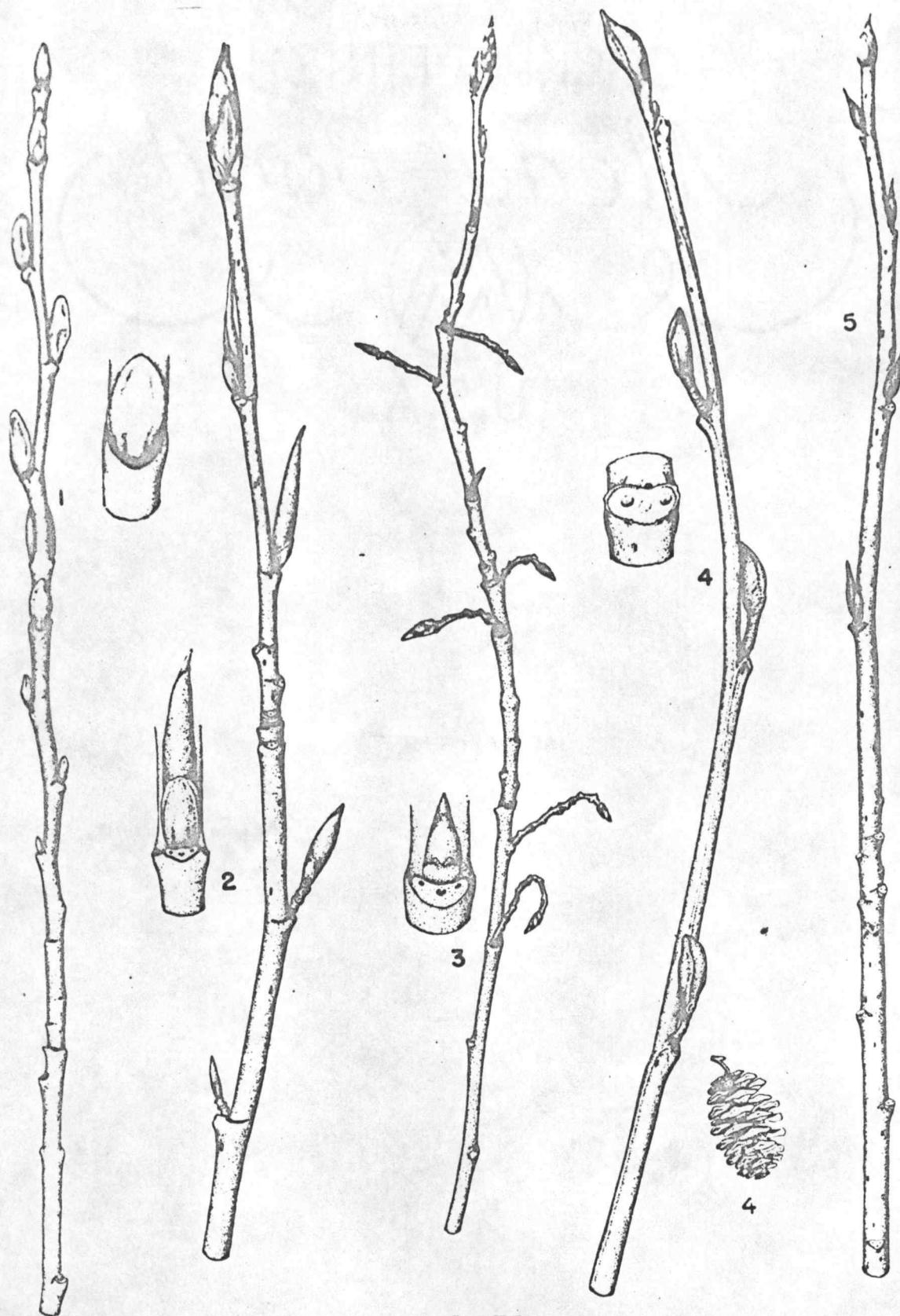


PLATE I

Fruit small cone, 3/4 inch or less, on peduncle longer than the cone. Scales thin, light colored, nutlet as broad as wing. Flowers appearing with leaves on new growth in spring.

Mountains, often in thickets.

#### CORYLACEAE

##### Corylus L.

Shrubs. Twigs slender, round, zigzag. Pith obscurely 3-angled. Terminal bud lacking. Leaf scars alternate, raised, 2 ranked on horizontal branches. Bundle trace scars 3 or multiple and obscure. Staminate catkins long, pendulous, flowers in a scaly bud developing early in winter.

Corylus californica Rose. Western hazel. Plate II.

Corylus rostrata californica A. DC. Prod. 162:133. 1864. Corylus californica Rose, Gard. and Forest, 8:263. 1895.

Tall shrub reaching 20 feet. Branches typically growing horizontally on mature plants unless grazed or otherwise mutilated. Bark smooth, gray. Twigs very slender, zigzag, gray-brown, white pubescence on new growth. Lenticels scattered, low, pale orange. X-section round. Pith small, obscurely 3-angled, brown, becoming imperfectly chambered.

Buds ovoid to globose, 1/4 inch long, usually 4 gray-brown pubescent scales visible, terminal bud lacking.

Leaf scars alternate, raised, half round to reniform.

Bundle trace scars 3. Phyllotaxy 2/5 on erect shoots appearing 1/2 on older horizontal branches.

Flowering in early winter. Staminate flowers in long pendant catkins, pistillate several in a scaly bud, deep red stigmas protruding.

Common in woods and along streams.

#### FAGACEAE

#### Quercus L.

Trees or shrubs, deciduous but dry leaves often persisting during winter. Twigs slender to moderately stout. Pith star shaped, continuous. Buds sessile, sometimes angled; internodes progressively shortened toward the tips causing buds to be clustered at the end. Scales numerous, 5 ranked. Leaf scars alternate, raised. Bundle trace scars about 12, scattered. Stipule scars small.

Quercus garryana Dougl. White oak. Oregon oak. Plate II.

Quercus garryana Dougl.; Hook. Fl. Bor. Am. 2:159. 1839. Quercus douglasii Benth. Pl. Hartw. 337. 1857, not Hook. and Arn. teste specimen in Kew Hb. (W.L.J.) Quercus oerstediana R. Br. Campst. Ann. and Mag. Nat. Hist. IV. 7:250. 1871. Quercus jacobii R. Br. l.c. 255. Quercus breweri Engl. Bot. Cal. 2:96. 1880. Quercus oerstediana Greene, W. Am. Oaks, 19, pl. 10. 1889. Quercus gilbertii Greene



W. Coast Oaks 77. pl. 37. 1889.

Tree reaching 50 feet or shrubby. Trunk short, clear.

Branches appearing to radiate from trunk, lower branches drooping, upper erect. Bark thin, pale gray-brown, in wide ridges with shallow furrows.

Twigs moderately stout, sometimes nearly fluted, red-brown with rusty fascicled pubescence. Lenticels prominent, raised, scattered, white. Internodes short, a season's growth seldom as long as 5 inches.

X-section 5-angled. Pith star shaped, white, continuous.

Buds nearly 1/2 inch long, ovoid to conical, obscurely 5-angled, appearing clustered near the tips; lateral buds more ovoid, shorter than terminal. Scales in 5 vertical rows, typically with pale or rusty pubescence, lighter in color than twig. Buds of Q. garryana tend to be longer and more acute than those of Q. Kelloggii but there is a broad overlapping in general shape.

Leaf scars conspicuously raised, alternate, half round to reniform. Bundle trace scars many in 3 groups. Leaf scar covered by a corky development partially obscuring bundle trace scars.

Fruit an acorn developing the first year. Cup shallow, scales swollen, pubescent. Nut smooth and shining.

Woodland, dry hillsides, valley floors.

Quercus kelloggii Newb. Black oak. Plate II.

Quercus tinctoria var. californica Torr., Pac. R. Rep. 4:138. 1856. Quercus kelloggii Newb., Pac. R. Rep. 6:28. 1857. Quercus californica mensis Benth., DC. Prod. 16:62. 1864.

Tree reaching 75 feet or shrubby especially in high altitudes. Trunk short, seldom upright, crowns irregular, open, rounded. Bark dark, checked on older trunks, smooth on branches.

Twigs moderately stout, dull red-brown, ribbed from leaf scars, pubescence of white fascicled hairs mostly confined to the creases of the nearly fluted twigs, generally not as heavily pubescent as Q. garryana. Lenticels small, inconspicuous.

X-section 5-angled. Pith star-shaped, white, continuous.

Buds ovoid to conical, tending to be more ovoid than Q.

garryana, not apparently angled, generally not clustered at tips of vigorously growing shoots. Terminal bud best developed, laterals successively smaller. Scales typically glabrous except the pubescent margins, lustrous, thin, papery, same color as or lighter than twig, tending to be short, rounded at apex, but general shape intergrading with that of Q. garryana.

Leaf scars conspicuously raised, alternate, half round to reniform. Bundle trace scars many, obscured by a corky development.

Fruit an acorn developing in 2 years, cup deep, scales

thin, pubescent. Nut over 1 inch long, pubescent.

Leaves sharply lobed, spine tipped.

From vicinity of Eugene, Lane Co., southward.

## RANUNCULACEAE

### Clematis L.

Soft wooded vines climbing by petioles or petiolules. Shoots 6 to 12 angled. Pith angled or armed, often hollow in cortex beneath ridges, white, continuous. Buds small, ovoid, solitary in most species; Petioles opposite, persistent. Stipule scars lacking.

Clematis ligusticifolia Nutt. Wild clematis. Plate II.

Clematis ligusticifolia Nutt., Torr. and Gray,  
Fl. N. Am. 1:19. 1838. Clematis brevifolia How.,  
Fl. N. W. Am. 8. 1897.

Climbing vine, hardly woody except at base. Stems reaching 40 feet with a diameter of 3 inches at bases. Bark on older portions gray, shredding, younger portions dull brown to straw colored.

Twigs slender, brown to straw colored, sparsely short pubescent toward the ends, no lenticels apparent. Petioles opposite, persistent, joined around the stem by a raised flange.

X-section 6-angled or fluted. Pith large, white, 12-armed.

Wood meager.



## Plate II

6. Corylus californica Rose. Western hazel.
7. Quercus garryana Dougl. White oak.  
Garry oak.
8. Quercus kelloggii Newb. Black oak.
9. Clematis ligusticifolia Nutt. Wild  
clematis.

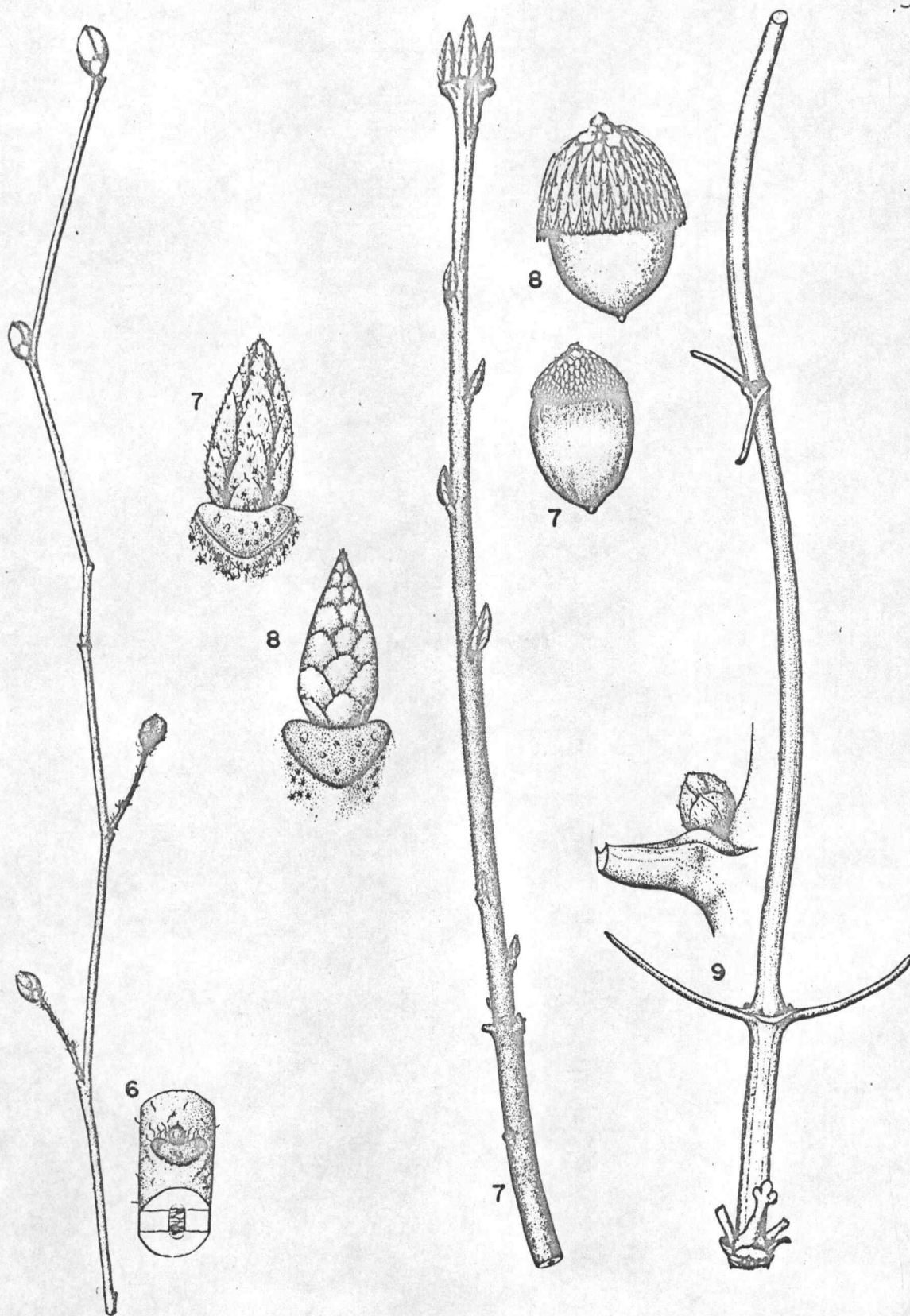


PLATE II

Buds in axis of petioles, about 1/8 inch, enclosed by 2 or 3 pairs of opposite, brown, shortly white pubescent scales.

Definite leaf scars never formed, petioles removed only by tearing or weathering.

Woods and thickets.

## SAXIFRAGACEAE

### Ribes L.

Shrubs, loosely branched; bark exfoliating. Twigs cylindrical, ribbed from leaf scars, often armed with nodal spines and internodal prickles. Pith becoming spongy. Buds sessile or stalked, scales loose, ours usually glandular-margined and 3-veined; odor typical of the genus. Bud scales morphologically petiole bases. Leaf scars alternate, slightly raised, narrow and angularly crescent-shaped or broad. Bundle trace scars 3. Stipule scars lacking.

Ribes lacustre (Pres.) Poir. Swamp currant. Prickly currant.

Plate III.

Ribes oxycanthoides var. lacustre Pres. Syn. Pl. 1:262. 1805. Ribes lacustre Poir. in Lam. Encycl. Suppl. 2:56. 1812. Ribes echinatum Dougl. Trans. Hort. Soc. Lond. 7:17. 1830. Ribes parvulum Rydb. Mem. N. Y. Bot. Gard. 2:203. 1900.

Shrubs, erect or prostrate, reaching 5 feet. Branches crooked, bark gray.



Twigs pale or orange-brown becoming darkened, pale, short spreading sometimes glandular pubescence; usually densely spiny with internodal prickles; nodal spines many, spreading. Bud scales persisting.

Pith angled, gray white when cut, spongy, cavities sometimes very large.

Buds 1/4 inch, terminal larger than laterals, diverging.

Scales thin, glabrous or minutely pubescent, orange-brown or rosy, 3-veined, often leaf blade rudiments at tip, margins glandular ciliate.

Leaf scars slightly raised, narrow, angularly crescent-shaped. Bundle trace scars 3.

Ribes lobbii Gray. Gummy gooseberry. Plate III.

Ribes subvestitum Hook. Bot Mag. t. 4931. 1856.  
not Hook. and Arn. Ribes lobbii Gray, Proc. Am.  
10:274. 1876. Grossularia lobbii Cov. and Britt.  
N. Am. 10:274. 1908.

Shrubs reaching 6 feet, spreading, erect. Bark dark gray, cracking circumferentially giving trunks an odd ringed appearance.

Twigs dull straw-colored turning dull dark gray when older, glandular, glabrate or typically nearly woolly with short white pubescence. Internodal prickles lacking, found rarely on water sprouts. 3 slender, lustrous, orange tinted spines at nodes. Not conspicuously ribbed from leaf scars. Bark shredding leaving stems lustrous dark red-brown, lenticels conspicuous after epidermis

exfoliates. Bud scales persistent.

X-section round. Pith crenately round, green turning brown when cut, spongy.

Buds 1/8 inch, tawny to yellowish, pubescent, scales 3-nerved, often leaf blade rudiments at tip, margins glandular, ciliate.

Leaf scars alternate, slightly raised, narrow, angularly crescent-shaped. Bundle trace scars 3.

Open slopes. Cascades and Coast Range.

Ribes menziesii Pursh. Coast prickly-fruited gooseberry.

Plate III.

Ribes menziesii Pursh. Fl. Am. Sept. 732. 1815.  
Ribes ferox Smith in Rees' Cycl. 30: no. 26.  
 1815. Ribes subvestitum Hook. and Arn. Bot.  
 Beechy Voy. 346. 1838. Ribes occidentale Hook. and  
 Arn. l.c. Ribes hesperium McCl. Erythea. 2:79.  
 1894. Ribes hystrix Eastw. Proc. Cal. Acad. ser.  
 3. Bot. 2:248. 1902. Ribes occidentale var. hes-  
perium Jancz. Mem. Soc. Geneve 35:358. 1907.  
Grossularia menziesii Cov. and Britt. N. Am. Fl.  
 22:214. 1908. Grossularia leptosma Cov. and Britt.  
 l.c. Grossularia senilis Cov. l.c. Grossularia  
hystrix Cov. and Britt. l.c. Ribes californicum  
 var. hesperium Jancz. Mem. Soc. Geneve 35:368.  
 1907.

Shrub reaching 6 feet, erect, loosely branched.

Twigs zigzag, slender, orange-brown, pubescent with hooked white hairs, often glandular, tips of branches frequently dying back in winter. Not conspicuously ribbed from leaf scars. Densely prickly with internodal prickles, nodal spines 3, rarely more.

Pith spongy, turning gray when cut.

Buds not apparently stalked, 1/4 inch or less, scales tawny or straw colored, pubescent, 3-veined, tipped with leaf blade rudiments, margins ciliate.

Leaf scars alternate, slightly raised, narrowly crescent-shaped. Bundle trace scars 3.

Along coast, mostly in Lane County. Usually growing in thickets.

Ribes divaricatum Dougl. Coast black gooseberry. Straggly gooseberry. Plate III.

Ribes divaricatum Dougl. Trans. Hort. Soc. Lond. 7:515. 1830. Ribes irriguum Dougl. lc. Ribes villosum Nutt.; Torr. and Gray. Fl. N. Am. 1:547. 1840. Ribes tomentosum K. Koch, Wochenschr. Gart. and Pfl. 2:138. 1859. Ribes parishii Hel. Muhlenbergia. 1:134. 1904. Ribes suksdorfii Hel. Muhlenbergia. 3:11. 1907. Grossularia parishii Cov. and Britt. N. Am. Fl. 22:224. 1908.

Shrub, abundant straggling, drooping branches as long as 10 feet. Bark gray.

Twigs bleached or straw colored, glabrous, ribbed from leaf scars. Epidermis exfoliating, bark becoming shreddy. No internodal prickles, nodal spines single, rarely 3, dark-colored, laterals usually rudimentary and blunt. Bud scales persistent.

X-section round. Pith turning brown when cut, spongy.

Buds 1/4 inch long, light brown or straw colored. Scales acute, keeled, indistinctly 3-veined, white pubescent, margins of inner scales woolly.

Leaf scars alternate, slightly raised, angularly crescent-



## Plate III

10. Ribes lacustre (Pers.) Poir. Swamp currant
11. Ribes lobbi Gray. Gummy gooseberry.
12. Ribes menziesii Pursh. Coast prickly-fruited gooseberry.
13. Ribes divaricatum Dougl. Coast black gooseberry. Straggly gooseberry.

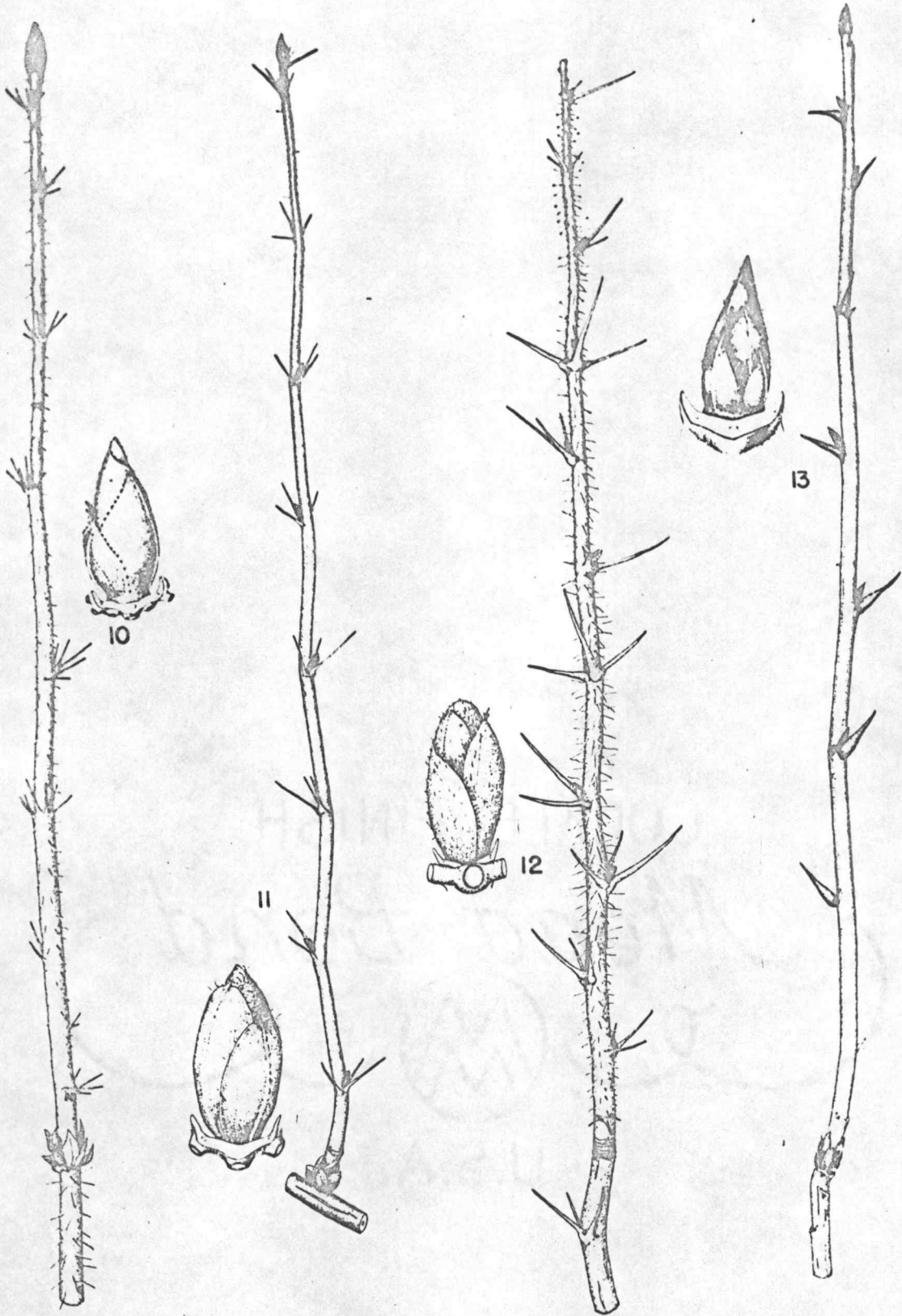


PLATE III

shaped, narrow. Bundle trace scars 3.

Streams in Cascades and Coast Range foothills, usually growing in thickets.

Ribes bracteosum Dougl. Stinking black currant. Plate IV.

Ribes bracteosum Dougl., Fl. Bor. Am. 1:233. 1832.

Shrub reaching 10 feet or taller in shade, erect or straggling, scantily branched.

Twigs stout, malodorous, straw-colored or green tinted, glabrous, glandular near tips, with dull luster; lenticels swollen. Bark exfoliating; unarmed. Bud scales deciduous.

X-section round. Pith large, crenately round, minutely spongy, white, continuous.

Buds prominently stalked, laterals appressed reaching 1/4 inch in length, terminal nearly 1/2 inch. Scales numerous, loose, keeled, tan or brown at tips shading into green, margins minutely white ciliate, glandular, faces glabrous, apices obcordate, lateral nerves indistinct.

Leaf scars alternate, low, broad, covered by a membrane projecting beyond the scar over the stem below. Bundle trace scars 3 along upper margin of leaf scar. Phyllotaxy 2/5.

In moist, shaded places at low altitudes in the Cascades and Coast Range.



Ribes laxiflorum Pursh. Coast trailing currant. Plate IV.

Ribes americanum Pall. Fl. Ross. 1:34. 1788, not Mill. 1768. Ribes laxiflorum Pursh, Fl. Am. Sept. 731. 1814. Ribes affine Dougl.; Bong. Mem. St. Petersburg VI. 2:138. 1832.

Shrubs reaching 5 feet, erect or trailing, sometimes prostrate with ascending branches.

Twigs soft, moderate size, light orange-brown to straw colored, pubescent with short curved white hairs, only faintly ribbed from leaf scars, bark becoming shreddy leaving dark stem. Bud scales persisting. Unarmed. Similar to R. bracteosum; readily distinguished by narrow leaf scars.

Pith spongy, pale or white.

Buds stalked, 1/4 to 1/2 inch, tan or brown with red tints.

Scales loose, 3-veined, often tipped with leaf-blade rudiments, glabrous or pubescent, margins ciliate.

Leaf scars alternate, slightly raised, narrow, angularly crescent-shaped. Bundle trace scars 3.

Leaf scars alternate, slightly raised, narrow, angularly crescent-shaped. Bundle trace scars 3.

Moist timber and burns, mainly in Coast Range.

Ribes sanguineum Pursh. Red-flowering currant. Plate IV.

Ribes sanguineum Pursh, Fl. Am. Sept. 164. 1814. Calobotrya sanguinea Spach, Ann. Sci. Nat. II. 4:21. 1835. Ribes glutinosum Benth. Trans. Hort. Soc. ser. 2, 1:476. 1835. Coreosma sanguinea Spach, Hist. Veg. 6:155. 1838. Ribes scuphamii Eastw. Proc. Calif. Acad. III. 2:242. 1902. Ribes deductum Greene; Jancz. Mem. Soc. Geneve 35:430. 1907.

Shrubs reaching 8 feet, erect or bushy. Bark gray brown, exfoliating.

Twigs moderately slender, orange or red tinted, sometimes dull with short gray pubescence, bark often beginning to exfoliate near base. Older portions dull gray-brown with none of the orange color of the younger growth; many short spurs. A faint, rather pleasant odor when broken. Bud scales not persisting.

Pith obscurely 5-angled, pale to dark brown, spongy but not always noticeably so, continuous.

Buds conspicuous rosy red, reaching 1/2 inch in length, laterals short stalked. Scales 3-veined, margins glandular without ciliate hairs, inner scales sticky, difficult to separate, bearing long pubescent-stalked glands when expanded. Leaf rudiments plaited.

Leaf scars alternate, slightly raised, angularly crescent-shaped. Bundle trace scars 3. Phyllotaxy 2/5.

Open woods and thickets.

Ribes acerifolium How. Plate IV.

Ribes acerifolium How. Erythea 3:32. 1895.  
Ribes howellii Greene. Erythea 4:57. 1896.

Shrubs reaching 5 feet, nearly erect. Bark shredding, leaving smooth dark gray stems.

Twigs moderately slender, straw colored or orange-brown, pubescent with short curved white hairs, occasionally glandular; faintly ribbed from leaf scars. Bark turning

gray; spurs frequently formed. Bud scales not persisting. X-section round. Pith round or obscurely 5-angled, brown, spongy.

Buds stalked, terminal 1/4 inch or longer, laterals shorter.

Scales 3-veined, glabrous to minutely pubescent, margins sometimes ciliate and glandular, red tending more to a purple cast than R. sanguineum and generally not as intensely colored; inner scales gummy; leaf blade rudiments frequently at tips.

Leaf scars alternate, slightly raised, narrow, angularly crescent-shaped. Bundle trace scars 3.

Thickets at or below timberline in the Cascades.

#### HYDRANGEACEAE

#### Philadelphus L.

Widely branched shrubs; twigs obscurely 3-angled.

Pith white, solid, continuous. Buds small, sessile, solitary; terminal bud lacking. Leaf scars commonly opposite, covered by a membrane which may also cover the bud. Bundle trace scars 3. Stipule scars lacking.

Philadelphus gordonianus Lindl. Mock orange. Syringa.

Plate IV.

Philadelphus gordonianus Lindl. Bot. Reg. 24: Misc. 21. 1838. Philadelphus columbianus Koehne, Gartenfl. 1896:542. 1896. Philadelphus confusus Piper, Bull. Torrey Club 29:225. 1902 as to most



specimens cited. Philadelphus angustifolius Rydb. N. Am. Fl. 22:166. 1905. Philadelphus platyphylus Rydb. l.c. 167. Philadelphus lewsii var. gordonianus Jep. Man. 466. 1930.

Shrub reaching 12 feet, erect with spreading branches. Bark gray, slightly rough.

Twigs slender, widely dichotomously branching, flattened at nodes, keeled below leaf scar. Dark red-brown to pale, nearly lustrous, scattered pubescence near tip, lenticels inconspicuous; characterized by apparent absence of buds.

X-section round. Pith large, white, continuous, oval or obscurely 6-angled.

Buds minute, naked, green and pubescent, hidden beneath membrane covering leaf scar. Terminal bud absent.

Leaf scars small, raised, opposite, angular, covered by a membrane, the pair connected by a line around the twig.

Bundle trace scars 3.

Common.

## ROSACEAE

### Physocarpus Maxim.

Loosely branching shrubs with brown exfoliating bark.

Twigs cylindrical, 4 ribbed. Pith brown, solid, continuous.

Buds sessile; scales loose, brown. Leaf scars alternate.

Bundle trace scars 5, upper pair small. Stipule scars small.

Physocarpus capitatus (Pursh) Ktze. Nine bark. Plate IV.

Spiraea capitate Pursh, Fl. Am. Sept. 342:1814.  
Spiraea opulifolia var. tomentella Ser.; DC.  
 Prod. 2:542. 1825. Physocarpa opulifolia Raf. New  
 Fl. 3:73. 1836. Physocarpa tomentosa Raf. l.c.  
 74. Spiraea opulifolia var. mollis Torr. and Gray,  
 Fl. N. Am. 1:414. 1840. Nellia opulifolia var.  
mollis Brewer and Wats. Bot. Cal. 1:171. 1876.  
Nellia capitata Greene, Pittonia 2:28. 1889.  
Physocarpus capitatus Ktze. Rev. Gen. Pl. 2:219.  
 1891. Opulaster capitatus Ktze. l.c. 949.  
Opulaster opulifolius var. capitatus Jep. Fl. W.  
 Mid. Cal. 276. 1901. Opulaster cordatus Ryd. N.  
 Am. Fl. 22:242. 1908.

Shrubs reaching 8 feet, straggly, irregularly branched.

Bark dark brown, exfoliating in sheets and shreds giving the shrub a characteristic ragged aspect.

Twigs orange-brown, often twisted, sharply angled and ribbed below leaf scars. Bud scales persistent. Spurs formed. X-section flattened or angled in new growth, becoming round.

Pith tan, oval or round, continuous.

Buds twisted, about 3/8 inch, scales open, minutely pubescent, dry, edges ragged, lower scales keeled.

Leaf scars alternate, raised, small, as broad as long, angularly crescent-shaped, often shriveled. Bundle trace scars 5, upper pair small.

Common along streams.

### Spiraea L.

Shrubs, usually low with simple branches. Twigs mostly slender, cylindrical or angled. Pith white, continuous.

Buds small, usually solitary, sessile, with several exposed

## Plate IV

14. Ribes bracteosum Dougl. Stinking black  
currant.
15. Ribes laxiflorum Pursh. Coast trailing  
currant.
16. Ribes sanguineum Pursh. Red-flowering  
currant.
17. Ribes acerifolium Howell.
18. Philadelphus gordonianus Lindl. Mock  
orange. Syringa.
19. Physocarpus capitatus (Pursh) Kuntze.  
Nine-bark



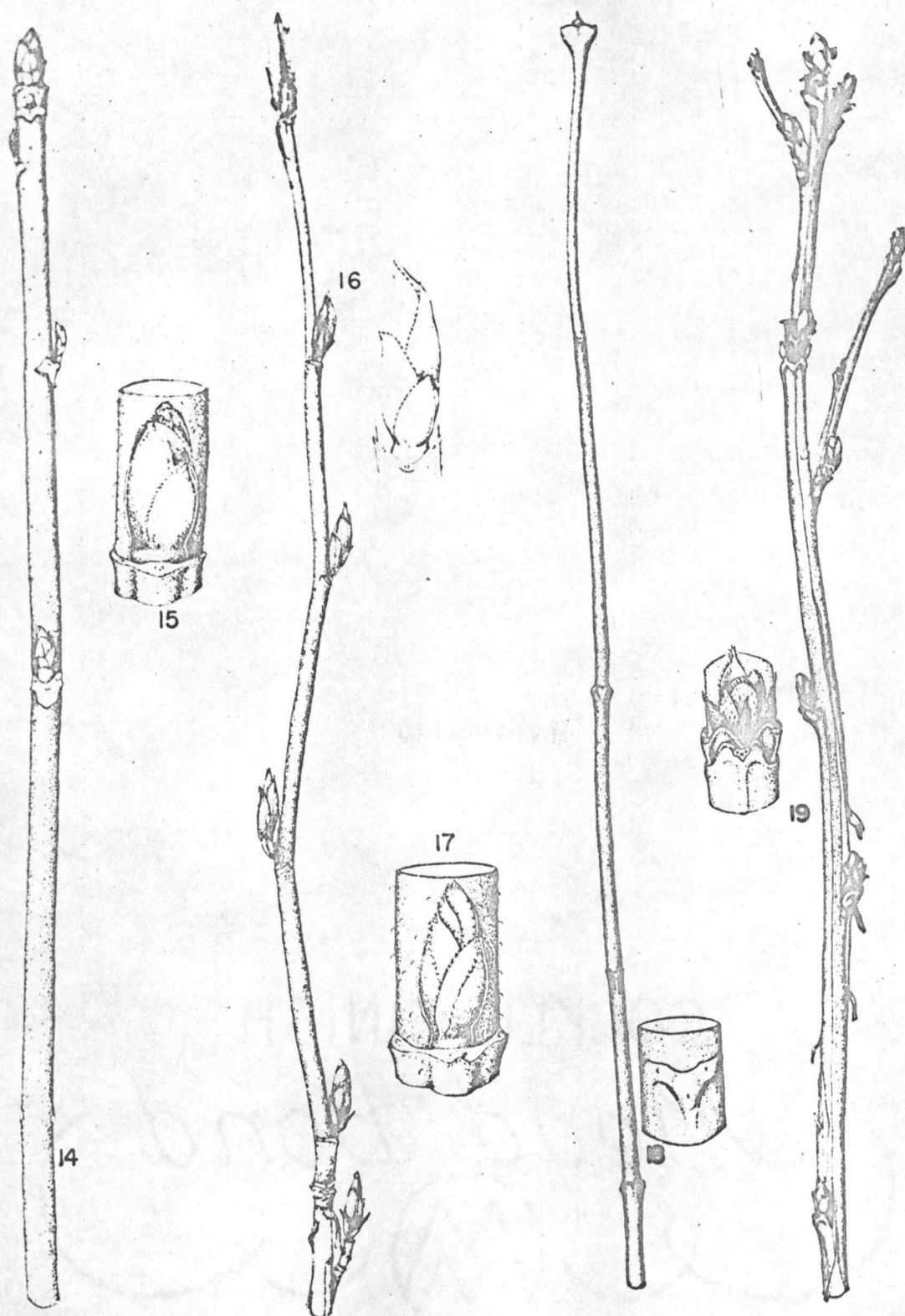


PLATE IV

scales. Leaf scars alternate, small, often highly raised. Bundle trace scar single. Stipule scars lacking.

Spiraea lucida Dougl.

Spiraea betulifolia Hook. Fl. Bor. Am. 1:172. 1892, not Pall. 1784. Spiraea lucida Dougl. l.c., as a synonym. 1832; Greene, Pittonia 2:221. 1892. Spiraea corymbosa var. lucida Zabel. Handb. Laubh. Deuts. Dendr. Ges. 157. 1903.

Prostrate shrub sending up erect shoots as long as 2 feet.

Bark light red-brown. Similar in all appearance except habit to S. densiflora.

Twigs straight, slender, dully lustrous, glabrous, brown with shades of pink or red, seldom an orange-brown.

Epidermis exfoliating on older portions. Bud scales persisting. Usually terminating in an inflorescence.

X-section 5-angled. Pith large, white, continuous.

Buds under 1/8 inch, broadly ovoid to conical, diverging, same color as twig. Exposed scales about 6, keeled at tip, glabrous, acute, margins not ciliate.

Leaf scars alternate, small, triangular, surrounded by a pale area, raised. Bundle trace scar single. Phyllotaxy 2/5.

Inflorescence a dense corymb, persisting.

Mountains.

Spiraea densiflora Nutt. Plate V.

Spiraea densiflora Nutt. Fl. N. Am. 1:414. 1840. Spiraea betulaefolia rosea Gray, Proc. Am. Acad. 8:381. 1862. Spiraea splendens Baum. Monats. Ber.

Bef. Gart. Preuss. 18:294. 1875. Spiraea lucida  
var. rosea Greene, Pittonia 2:221. 1895. Spiraea  
arbuscula Greene, Erythea 3:63. 1895. Spiraea  
helleri Rydb. Fl. N. Am 22:248. 1908.

Low shrub reaching 3 feet, stems stiff erect, branching  
above, branches mostly simple, bark brown, orange or red-  
tinted, exfoliating.

Twigs slender but rigid, glabrous, lustrous, orange-brown  
on new growth, dark red-brown inner bark exposed after  
outer is shed. Bud scales persistent.

X-section 5-angled. Pith white, 5-angled, continuous.

Buds under 1/8 inch, ovoid to conical, diverging. Exposed  
scales about 6, glabrous, margins ciliate, keeled. Ter-  
minal buds not present, twig usually ending in an in-  
florescence.

Leaf scars alternate, raised, small, light, triangular,  
surrounded by a light area. Bundle trace scar single.

Phyllotaxy 2/5.

Fruiting inflorescence of small, dense corymbs, persistent.  
Mountains at timberline.

Spiraea douglasii Hook. Hardhack. Plate V.

Spiraea douglasii Hook. Fl. Bor. Am. 1:172. 1834.  
Spiraea nobleana Hook. Bot. Mag. t. 5169. 1860.

Shrubs 3 to 6 feet high, with straight, ascending branches.  
Bark deep red-brown.

Twigs very slender, dark red-brown covered with matted  
pubescence, becoming glabrous the second year, ribbed



below leaf scars. Branchlets at right angles to main stem. Bud scales persisting.

X-section 5-angled. Pith continuous, white, turning gray or brown.

Buds less than 1/8 inch, densely woolly, pale gray. Scales several, pale red-brown or straw colored, acute, keeled but obscured by the pubescence. Leaf rudiments imbricate. Terminal bud not present, twig usually terminating in an inflorescence.

Leaf scars alternate, not raised, triangular, surrounded by a pale area. Bundle trace scar single. Phyllotaxy 2/5.

In moist situations, mostly swales and bordering water; occasionally in drier locations.

Holodiscus Maxim.

Shrubs with alternate leaf scars and no visible stipule scars. Fruiting panicles persistent in most cases, fruit of late dehiscing, single-seeded, beaked pods.

Holodiscus discolor (Pursh) Maxim. Ocean spray. Plate V.

Spiraea discolor Pursh, Fl. Am. Sept. 342. 1814.  
Spiraea ariaefolia Smith in Rees Cycl. 33:No. 6.  
 1816. Schizonotus discolor Raf. New. Fl. 3:75.  
 1838. Spiraea dumosa Torr.; Stansbury, Expl.  
 Great Salt Lake 387 pl. 4. 1852. not Nutt. 1840.  
Holodiscus discolor Maxim. Act. Hort Petrop. 6:  
 254. 1890. Schizonotus ariaefolius Greene, Fl.  
 Fr. 58. 1891, in part. Schizonotus argenteus var.  
ariaefolius Kuze. Rev. Gen. Pl. 1:255. 1891.  
Holodiscus ariaefolius Greene, Man. Reg. S. F.  
 Bay 113. 1894. Holodiscus glabrescens Heller,

Muhlenbergia 1:40. 1904. Seriotheca glabrescens Rydb. N. Am. Fl. 22:265. 1908. Sericotheca obovata Rydb. N. Am. Fl. 22:264. 1908. Sericotheca discolor Rydb. N. Am. Fl. 22:262. 1908.

Shrub reaching 15 feet, irregularly branched; bark dull brown or gray-brown.

Twigs moderately slender to stout, dull tawny-brown, 3-ribbed from leaf scars. Minutely pubescent on new growth.

Disagreeable odor when broken. Bark becoming shreddy.

X-section round. Pith 5-angled, white, continuous.

Buds 1/4 inch in length, often small, terminal bud larger than laterals. Two outer scales short, open, early deciduous; keeled, brown, lustrous, sparsely pubescent. Inner scales usually not loose, tan or rosy with dense gray-white pubescence.

Leaf scars alternate, greatly raised, crescent-shaped to 3-lobed. Bundle trace scars 3. Phyllotaxy 2/5.

Common.

### Pyrus L.

Trees or shrubs. Twigs moderate, round. Pith obscurely angled. Buds moderate, sessile, solitary; exposed scales about 4, usually keeled; in our species morphologically petioles. Leaf scars alternate, raised. Bundle trace scars 3. Stipule scars lacking.

Pyrus fusca Raf. Wild crab-apple. Plate V.

Pyrus fusca Raf. Med. Fl. 2:254. 1830. Pyrus

diversifolia Bong. Mem. Acad. St. Petersburg. VI. 2:133. 1832. Pyrus rivularis Dougl. ex Hook. Fl. Bor. Am. 1:203. pl. 68. 1833. Malus rivularis M. Roem. Fam. Nat. Syn. 3:215. 1847. Malus diversifolia M. Roem. l.c. Malus fusca Schneider. Handb. Laubh. Deuts. Dendr. Ges. 1:723. 1906.

Small tree or shrub reaching 30 feet, often growing in thickets. Bark thin, in loose red-brown plates.

Twigs moderate, pubescent, becoming glabrous, red-brown turning brown; lenticels small, pale, not raised, faintly lined from leaf scars. Spurs formed.

X-section round. Pith white, continuous, crenately round. Faintly bitter to taste.

Buds about 1/8 inch, terminal larger than laterals, bluntly acute. Scales several, apices bifid or acute-tipped, margins pubescent, faces glabrous and lustrous to pubescent, bright red; lower scales swollen, fleshy at base. Leaf rudiments imbricated.

Leaf scars alternate, raised, half elliptical to narrowly shield shaped. Bundle trace scars 3, large. Phyllotaxy 2/5.

Along streams and road sides.

### Sorbus (Tourn.) L.

Rather erect branched shrubs or small trees. Twigs moderate, cylindrical, lenticels large. Pith continuous, brown. Buds nearly conical to oblong, the terminal large, laterals mostly remaining undeveloped, solitary, sessile.



Scales several, sometimes gummy, morphologically petiole bases. Leaf scars alternate, crescent-shaped to linear. Bundle trace scars 3 to 7. Stipule scars lacking.

Sorbus sitchensis Roem. Western mountain ash. Plate V.

Sorbus sitchensis Roem. Fam. Nat. Syn. 3:139.  
1847. Sorbus californica Greene. Pitt. 4:131.  
1900. Pyrus sitchensis Piper Mazama 2:107. 1901.  
Sorbus americana var. sitchensis Sudw. U.S.  
Dept. Agr. Misc. Circ. 92:133. 1927. Sorbus  
cascadensis G. N. J. Univ. Wash. Pub. Biol.  
7:174. 1938.

Shrubs from 4 to 15 feet tall, spreading slender branches forming around-topped crown. Bark thin, light gray, smooth or slightly rough.

Twigs moderately stout, red-brown, pubescent, turning brown and glabrous, fragrant when broken; lenticels pale, slightly raised, becoming greatly elongated.

Pith 5-angled.

Buds reaching 3/4 inch, terminal larger than laterals, acute, turning dark red, rusty or white pubescent to nearly glabrous, gummy. Visible scales about 4; leaf-blade rudiments often at tip.

Leaf scars alternate, narrow, crescent-shaped, scarcely raised, long, half encircling twig. Bundle trace scars 5. Phyllotaxy 2/5.

Mountains at moderate altitudes.

Sorbus occidentalis Greene. Small mountain ash. Plate V.

Pyrus occidentalis Wats. Proc. Am. Acad. 23:263.

1888. Sorbus occidentalis Greene. Fl. Fran. 54:  
1891.

Shrub 3 to 5 feet tall, branches erect, clustered, coarse.

Twigs very similar to S. sitchensis; moderate to stout,

dark red-brown becoming grayed, nearly glabrous to finely  
pubescent with white or rusty hairs, lenticels scarcely  
raised.

X-section round, pith pale brown, continuous, sharply  
5-angled.

Buds similar to S. sitchensis, not as red nor as gummy,  
smaller, about 1/4 inch. Exposed scales several, keeled,  
often with leaf-blade rudiments at tip.

Leaf scars alternate, low, crescent-shaped, more than half  
encircling the twig, petiole cap sometimes persisting.

Bundle trace scars 5.

Mountains at high altitudes.

#### Osmaronia Greene

Shrubs with chambered pith and moderate terete twigs.  
Buds often supra-axillary and mucronulate. Leaf scars  
crowded at tip and alternate, little raised, bundle traces  
3, stipule scars lacking.

Osmaronia cerasiformis (T. and G.) Greene. Indian Peach.

Oso berry. Plate VI.

Nuttallia cerasiformis Torr. and Gray, ex Hook.

## Plate V

20. Spiraea densiflora Nutt.
21. Spiraea douglasii Hook. Hardhack
22. Holodiscus discolor (Pursh) Maxim.  
Ocean spray.
23. Pyrus fusca Raf. Wild crab-apple.
24. Sorbus occidentalis Greene. Small  
mountain ash.
25. Sorbus sitchensis M. Roem. Mountain ash.



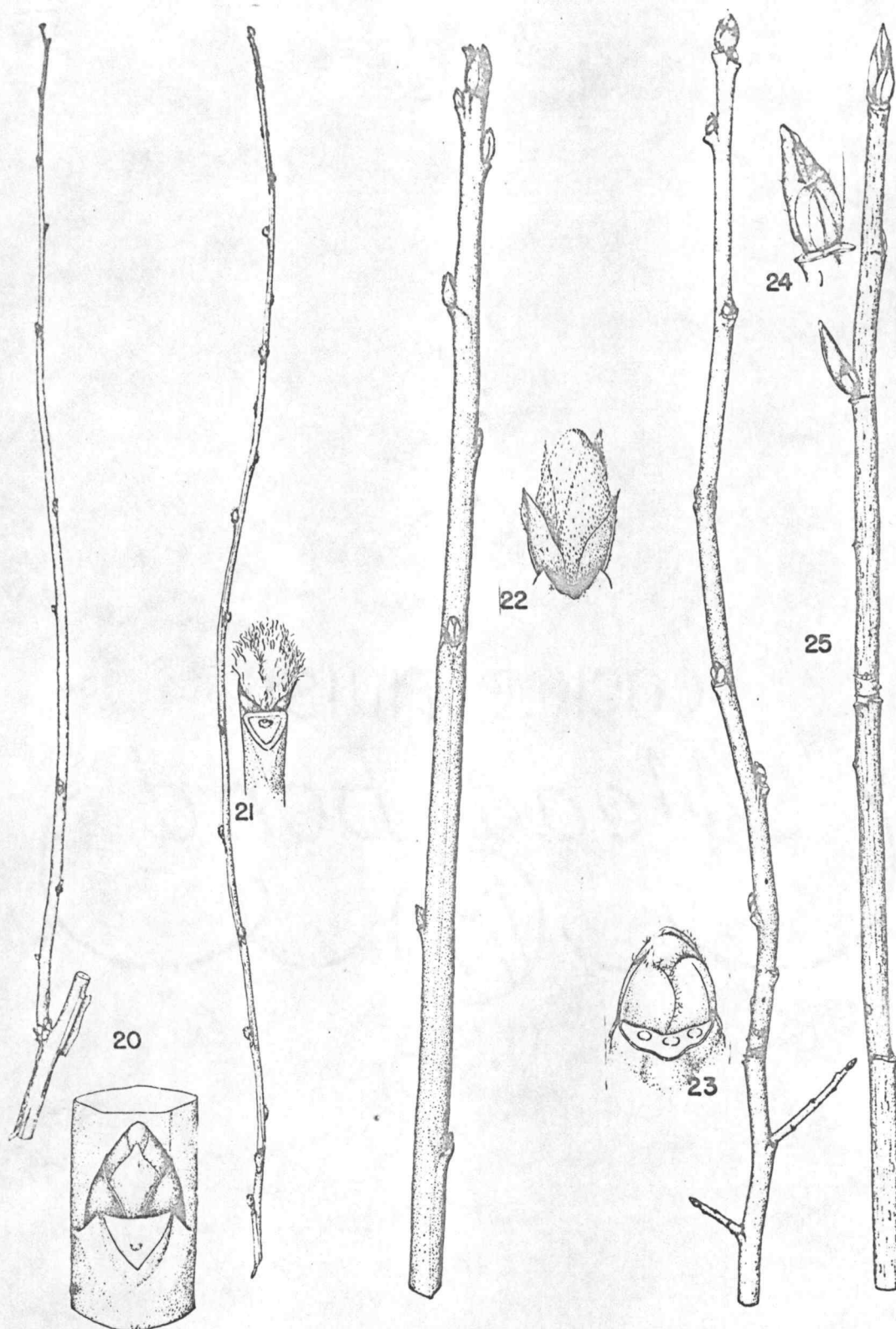


PLATE V

and Arn. Bot. Beechey 336. 1838. Exochordia  
dauidiana Baillon, Adansonia 9:149. 1869. Os-  
maronia cerasiformis Greene, Pittonia 2:191.  
 1891. Osmaronia obtusa Greene, Pittonia 5:310.  
 1905. Osmaronia demissa Greene l.c., Osmaronia  
bracteosa Greene l.c. Osmaronia laurina Greene  
 l.c. 311. Osmaronia padiformis Greene l.c.

Shrub up to 10 feet, erect, usually with one main trunk,  
 not widely branched. Bark smooth and light gray.

Twigs moderate; new growth greenish brown with pale len-  
 ticels slightly elongated vertically, glabrous. Odor  
 sharply pungent, taste bitter and slightly astringent  
 but surprisingly mild in comparison to the odor. Spurs  
 formed.

X-section round, wood greenish, pith moderately large,  
 white and chambered.

Buds conspicuously bright rosy red, the lateral supra-  
 axillary, ovoid, acute, sometimes reaching 1/2 inch,  
 but usually smaller, often asymmetrical; scales tending  
 to be bifid and acute tipped, some keeled, edges minutely  
 white ciliate. Scales loose.

Leaf scars alternate, narrow, slightly expanded at bundle  
 traces, crescent-shaped, little raised. Bundle trace  
 scars 3. Phyllotaxy 2/5.

The first shrub to flower in spring, often blossoming in  
 January.

Differing from Amelanchier with which it may be confused,  
 in the chambered pith, stronger odor, bright red in-  
 stead of dull purple buds.

Amelanchier Medic.

Shrubs or small trees with open crowns. Twigs slender, zigzag, nearly cylindrical. Pith obscurely 5-angled, pale or white, continuous, solid. Buds alternate, sessile, axillary or supra-axillary, solitary, of two kinds - the larger and more dilated flower buds and the elongated leaf buds. Scales morphologically petioles. Leaf rudiments plicate. Leaf scars alternate, raised, with 3 bundle trace scars. Stipule scars lacking.

Amelanchier florida Lindl. Service berry. Plate VI.

Aronia alnifolia Nutt. Gen. 1:306. 1818.  
Amelanchier florida Lindl. Bot. Reg. 19:pl., 1589. 1833. Amelanchier ovalis var. semiintegri-folia Hook. Fl. Bor. Am. 1:202. 1834. Amelanchier alnifolia Nutt. Jour. Acad. Phila. 7:22. 1834.  
Amelanchier glabra Greene, Fl. Fr. 52. 1891.  
Amelanchier pallida Greene, l.c. Amelanchier sub-integra Greene, Pitt. 5:109. Amelanchier venulosa Greene, Pitt. 4:21. 1899. Amelanchier gracilis Hel. Muhl. 2:59. 1905. Amelanchier siskiyouensis Schn. Ill. Handb. Laubh. 1:735. 1906. Amelanchier recurvata Abrams, Bull. Torr. Club. 37:151. 1910.

Shrubs reaching 12 feet. Branches slender, abundant, forming an open crown. Bark gray or gray-brown, smooth or slightly furrowed on older specimens.

Twigs slender, brown with red or yellow tints, becoming gray, glabrate with a few short hairs at the tips and around the buds to loosely woolly at apex; lenticels minute. Odor unpleasant, taste bitter. Spurs on older portions.



X-section round. Pith white, small, 5-angled, continuous. Buds slender, asymmetrical or curved, as long as 1/4 inch unexpanded, the terminal reaching 1/2 inch when inner scales expand. Several loose outer scales exposed, shading from dull purple to red, often yellow on margins, edges pubescent, apex emarginate with tip of keel extending between the teeth; scales often tipped with leaf-blade rudiments. Densely pubescent; inner scales usually protruding.

Leaf scars alternate, raised, narrowly crescent-shaped, constricted between bundle traces. Bundle trace scars 3. Phyllotaxy 2/5.

Common.

For distinguishing characteristics see Osmaronia cerasiformis.

#### Crataegus L.

Shrubs or trees, usually with twig-spines, stiff widely forking branches, rounded crowns. Twigs moderate to slender; pith small. Buds small, usually globose and shining, scales fleshy, morphologically petioles. Leaf scars alternate, raised. Bundle trace scars 3.

Crataegus douglasii Lindl. Western hawthorn. Western black haw. Plate VI.

Crataegus punctata var. brevispina Dougl. ex Hook. Crataegus douglasii Lindl. Bot. Reg.

21:pl. 1810. 1835. Crataegus rivularis Nutt.; Torr. and Gray, Fl. N. Am. 1:464. 1840. Crataegus consanguinea var. douglasii Torr. and Gray, l.c. Anthomeles douglasii Roem. Syn. Rosifl. 3:140. 1847. Mespulus rivularis, Crataegus brevispina Heller Cat. N. A. Pl. ed. 2. 98. 1900. Crataegus gaylussacia Hel. Bull. S. Ca. Acad. 2:69. 1903. Mespilus douglasii Aschers and Graebn. Syn. Metteleur. Fl. 62:24. 1906.

Shrubs or small trees reaching 30 feet. Branches spreading or ascending. Bark gray, smooth, appearing powdery.

Twigs slender, often with short internodes, dull red or brown, lustrous to dull with dense gray pubescence and mealy scurf; armed with stout thorns at right angles to stems, these morphologically modified branches, often having leaf scars near the base. Lenticels few, small and inconspicuous, slightly raised.

X-section round, inner bark thick, fleshy, red on rapidly growing twigs. Pith 5-angled, pale brown, continuous.

Buds mostly under 1/8 inch, blunt, oval on mature plants, acute on young rapidly growing specimens. Scales many, small, dry, sparingly scurfy, lower scales sparsely pubescent, lowest pair swollen, fleshy at base, leaf blade rudiments imbricate.

Leaf scars raised, alternate, round to half round; on young rapidly growing twigs a petiole cushion remaining, usually absent in mature slowly growing specimens. Bundle trace scars 3, obscured by mealy scurf. Phyllotaxy 2/5.

Common in pastures, roadsides and stream bottoms.

Rubus L.

Shrubs or trailing vines, usually soft-wooded. Stems round or 5-angled. Pith moderately large, crenately round or 5-angled, continuous. Buds sessile, axillary or supra-axillary, often superposed; bud scales in ours 3-parted at tips, morphologically petioles, minute buds in axils of lower scales. Leaf scars alternate, shriveled, mostly indistinguishable on persistent petiole bases. Bundle trace scars 3. Stipules often persistent.

Rubus spectabilis Pursh. Salmonberry. Plate VI.

Rubus spectabilis Pursh, Fl. An. Sept. 348. 1814.  
Rubus stenopetalus Cham. Voy. Pitt. Kamtch. 10.  
1822. Parmena spectabilis Greene, Leaflet. Bot.  
Obs. 1:244. 1906.

Shrub reaching 10 feet in height, stems erect, sparingly branched. Epidermis yellow, exfoliating.

Twigs moderate, orange-brown, nearly lustrous, minutely pubescent near tip, faintly ribbed from leaf scars; armed with short sharp prickles; lenticels not raised, inconspicuous. Bud scales persistent.

X-section round. Pith moderately large, white, continuous, obscurely 5-angled.

Buds 1/8 inch or longer, sometimes laterally multiple, ovate. Scales light colored, open, short appressed white pubescence on outer scales becoming heavier on inner scales. Lower scales acute, keeled, leaf buds in



axils.

Leaf scars alternate, raised on permanent petiole bases, shriveled. Bundle trace scars 3. Linear stipules sometimes remaining.

Rubus macropetalus Dougl. Wild blackberry. Plate VII.

Rubus macropetalus Dougl. Fl. Bor. Am. 1:178.  
1832.

Stems trailing, as long as 12 feet with long internodes, herbaceous at tip, red with a bloom causing them to appear purple, green on shaded side; glabrous or with appressed curved or spreading hairs or stalked glands; keeled and ribbed below leaf scars. Armed with straight, curved or reflexed prickles. Leaves tardily deciduous, mostly 3lobed, coarsely toothed.

X-section round. Pith large, 5-angled, white or brown in the center.

Buds 1/8 inch, superposed, unequal sizes. Scales red, glabrate to white pubescent, margins white ciliate, tips 3-parted, buds in axils of outer scales. Buds expanding early, exposing pubescent, green or brown-tinged inner scales.

Leaf scars alternate, raised on persistent petiole bases, shriveled. Bundle traces 3. Stipules persisting, long, linear. Phyllotaxy 2/5.

Common, conspicuous in burns and logged areas.

## Plate VI

26. Osmaronia cerasiformis Greene. Indian peach. Oso berry.
27. Amelanchier florida Lindl. Service berry.
28. Crataegus douglasii Lindl. Western hawthorn. Western black haw.
29. Rubus spectabilis Pursh. Balmon-berry.
30. Rubus parviflorus Nutt. Thimbleberry.
31. Rubus pedatus Smith. Trailing raspberry.
32. Rubus lasiococcus Gray. Trailing raspberry.

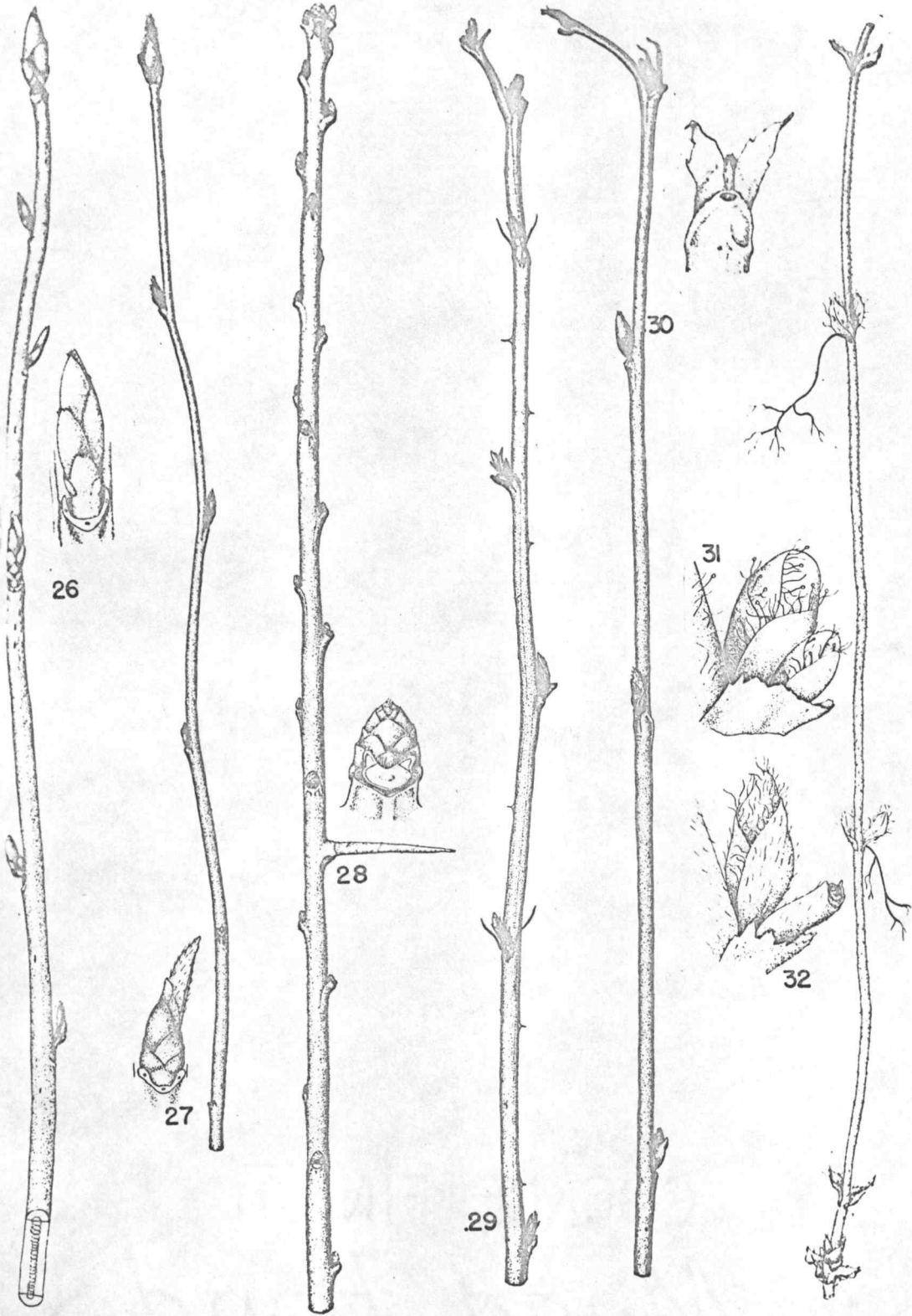


PLATE VI



Rubus leucodermis Dougl. Black-cap. Plate VII.

Rubus leucodermis Dougl. ex Torr. and Gray, Fl. N. Am. 1:454. 1840. Rubus occidentalis leucodermis Focke, Abh. Nat. Ver. Bremen. 4:147. 1874. Melanobatus leucodermis Greene, Lflts. Bot. Obs. 1:243. 1906. Melanobatus bernardinus Greene, op. cit. 1:244. Rubus bernardinus Rydb. N. Am. Fl. 22:444. 1913.

Straggling biennial shrub, new growth green, old canes light blue or lavender with heavy bloom making them conspicuous among other shrubbery. Tardily deciduous, a few leaves usually remaining on new growth, pinnately compound with 3 leaflets.

Twigs slender with long internodes, trailing at the tips.

Well armed with straight or recurving, broad-based prickles; glabrous.

X-section round. Pith pale brown, continuous, crenately round.

Buds superposed, reaching 1/4 inch. Scales loose, opening early, red or green, the lower keeled, glabrous to pubescent with long ciliate margins; tips of especially lower scales 3 parted; leaf buds in the axils. Rudimentary leaves conduplicate with stipules folded over.

Leaf scars alternate, shriveled, largely indistinguishable on a permanent petiole base. Bundle traces 3. Linear stipules occasionally persisting.

Common.

Rubus thyrsanthus Focke. Himalaya blackberry. Plate VII.

Rubus thyrsanthus Focke, Syn. Rub. Germ. 168.

Stout trailing stems 10 feet or more in length. Tardily deciduous, the palmately compound, 5-foliate leaves sometimes remaining all winter. Stems conspicuously maroon red, especially when wet. Forms large dense clumps building up over other vegetation.

Twigs conspicuously 5-angled or fluted, deep lustrous maroon red, slight bloom, sparingly pubescent at tips; well armed with flattened straight or curved prickles. Pleasant flower-like odor.

X-section 5-angled. Pith large, white, continuous, solid. Buds superposed, expanding early. Outer scales firm, brown or with red tints, sharply keeled, inner scales pale or green, all scales pubescent, 3 to 5 parted at tip. Buds in axils. Leaf rudiments conduplicate, enclosed in the stipules.

Rubus laciniatus Willd. Evergreen blackberry. Plate VII.

Rubus laciniatus Willd. Hort. Berol. pl. 82. 1807. Rubus vulgaris var. laciniatus Dippel, Handb. Laubh. Deuts, Dendr. Ges. 3:529. 1893.

Shrubs with long trailing prickly stems growing in dense clumps. Evergreen or tardily deciduous, leaflets 3 to 15, deeply incised, palmately compound.

Twigs moderately stout, green or dark nondescript shade tending toward red, glabrate to pubescent with soft

spreading hairs. Heavily armed with stout, recurved prickles, red at base shading to light tips, appearing whorled, growing from ridges of the stem.

X-section 5-angled to fluted. Pith 5-angled white continuous.

Buds small, narrowly ovate, superposed, unequal, divergent.

The several exposed scales dark colored, dry, short appressed or woolly pubescent, sharply keeled, apex 3 parted.

Leaf scars alternate, shriveled on raised petiole base.

Stipules, when present, linear. Bundle traces 3.

Phyllotaxy 2/5.

Widespread and common, an escape from cultivation.

Rubus parviflorus Nutt. Thimbleberry. Plate VI.

Rubus parviflorus Nutt. Gen. 1:308. 1818. Rubus nutkanus Moc. ex Ser. in DC. Prod. 2:566. 1825. Rubus lacer Kuntze, Meth. Sp. 103. 1879. Rubacer parviflorum Rydb. Bull. Torr. Club 30:274. 1903. Bossekia parviflora Greene, Leaflets Bot. Obs. 1:211. 1906.

Shrub reaching 7 feet, sparsely branched.

Twigs moderately sized, tawny to orange-brown, dull, minutely pubescent to nearly prickly with coarse hairs in adverse habitats; faintly ribbed from leaf scars, bluntly keeled below; lenticels not conspicuous; unarmed. Bud scales persisting. Epidermis exfoliating, exposing rust-brown inner bark.

X-section round. Pith moderately large, white, round,



continuous.

Buds reaching  $3/8$  inch long, narrowly ovoid, 4 to 5 exposed scales, papery, dull brown, two lower scales darker, sparingly pubescent near tips to densely gray pubescent, inner scales copiously appressed pubescent, margins ciliate. Buds in axils of scales.

Leaf scars alternate, raised on bases of persistent petiole bases, shriveled. Lanceolate stipules often persisting. Bundle traces 3.

Open woods, cut over areas and stream sides.

Rubus lasiococcus Gray. Trailing raspberry. Plate VI.

Rubus lasiococcus Gray, Proc. Am. Acad. 17:201. 1882. Comarobatia lasiococca Greene, Leaflets Bot. Obs. 1:245. 1906.

Low trailing plants with cord-like stems rooting at nodes, similar to R. pedatus. Stems with spreading or appressed white pubescence. Bud scales and stipules persisting.

X-section round.

Buds mostly superposed,  $1/8$  inch or smaller, hidden by persistent stipules, broad, ovoid, blunt. Scales thin, pink or purple tinted, margins long white ciliate, faces pubescent, apex 3 parted.

Open woods in mountains.

Rubus pedatus Smith. Trailing raspberry. Plate VI.

Rubus pedatus Smith, Pl. Ic. Ined. pl. 63. 1791. Dalibarda pedata Stephan, Mem. Soc. Nat. Mosc. 1:129. 1806. Comaropsis pedata DC. Prod. 2:555.

## Plate VII

33. Rubus leucodermis Dougl. Black-cap.
34. Rubus thyrsanthus Rocke. Himalaya  
blackberry.
35. Rubus laciniatus Willd. Evergreen  
blackberry.
36. Rubus macropetalus Dougl. Wild blackberry.



PLATE VII



1825. Ametron pedatum Raf. Sylva Tell. 161.  
1838. Psychrobatia pedata Greene, Leaflets Bot.  
Obs. 1:245. 1906.

Low trailing plants with cord-like stems rooting at nodes, spreading, curved or appressed white pubescence, mostly with brown long-stalked glands. Bud scales and broad stipules persisting.

X-section round.

Buds 1/8 inch or less, superposed, hidden beneath persistent stipules, ovoid, blunt. Scales glabrous, thin, almost lustrous, purple tinted, margins white ciliate, sometimes glandular, apex 3-parted.

Open woods in mountains.

R. pedatus and R. lasiococcus are by some authors considered to be possibly a single species. There is some intergrading in all winter characteristics, but the separation used in this key is reliable in most cases.

#### Rosa L.

Shrubs, erect or trailing, usually armed with slender or stout prickles. Stems cylindrical. Buds axillary or supra-axillary, ours mostly with glandular-margined scales, morphologically petioles. Leaf scars alternate, long, low narrow, usually nearly linear. Bundle trace scars 3. Stipule scars lacking.

Rosa gymnocarpa Nutt. Wood rose. Plate VIII.

Rosa gymnocarpa Nutt. Fl. N. An. 1:461. 1840.  
Rosa bridgesii Crepin, Bull. Soc. Bot. Belg.  
 15:54. 1876. Rosa spithamea var. subinermis En-  
 glm. Bot. Gaz. 6:326. 1881. Rosa glaucodermis  
 Greene, Leaflets Bot. Obs. 2:255. 1912. Rosa  
prionota Greene, l.c. Rosa piscatoria Greene,  
 l.c. Rosa crenulata Greene, l.c.

Shrubs reaching 4 feet, usually smaller. Branches slender,  
 bark brown.

Twigs slender, green in shaded locations, brown or purple  
 when exposed. Armed with straight, slender prickles  
 1/8 inch long or, often, unarmed. Prickles needle-like,  
 not expanded at base.

X-section round or oval. Pith crenately round, continuous,  
 white.

Buds often supra-axillary, divergent, occasionally laterally  
 multiple, green or pale rose, ovoid, the 4 to 6 exposed  
 scales glabrous, 3 nerved, acute tipped and emarginate,  
 white or rose colored marginal glands. Leaf rudiments  
 imbricate.

Leaf scars alternate, raised, linear, extending more than  
 half way around the stem.

Fruit ovoid, 3/8 inch long, borne singly on an unarmed  
 peduncle with stalked glands. Calyx lobes deciduous.

Woods or shaded situations.

Rosa rubiginosa L. Sweetbriar. Plate VIII.

Rosa rubiginosa L. Mant, 2:564. 1771. Rosa  
micrantha Borrer ex Smith, Engl. Bot. pl. 2490.

1813. Rosa suaveolens Pursh, Fl. Am. Sept. 346.  
 1814. Rosa walpoleana Greene, Leaflets Bot. Obs.  
 2:264. 1912.

Shrub reaching 9 feet or more, stems stout, little branched, curving outward giving the shrub a fountain-shaped appearance.

Twigs green, moderately stout, zigzag, glabrous, armed with stout recurved tawny-gray prickles; lenticels minute, white, low, numerous, inconspicuous.

X-section round. Pith white, obscurely 5-angled, continuous. Buds small, supra-axillary, divergent, globose to ovoid, apex bluntly acute. Several exposed scales, green with tints of pink, glabrous, margins usually brown, glandular ciliate.

Leaf scars linear, extending half way around the stem, alternate, low, slightly expanded at bundle traces. Bundle trace scars 3.

Fruit long urn-shaped, contracted into a neck, sparingly to densely spiny, borne singly or several in a corymb, pedicels often glandular hairy. Calyx lobes tardily falling away.

Introduced from Europe.

Rosa nutkana Presl. Common wild rose. Plate VIII.

- Rosa nutkana Presl, Epimel. Bot. 203. 1851.  
Rosa fraxinifolia Hook. Fl. Bor. Am. 1:199.  
 1834, not Borkh. 1790. Rosa lyalliana Crepin,  
 Bull. Soc. Bot. Belg. 15:39. 1876, as synonym.  
Rosa caryocarpa Dougl.; Crepin, l.c., as  
 synonym. Rosa woodsii Regel, Acta Hort.



Petrop. 5:299. 1877, not Lindl. 1820. Rosa macedougali Holz. Bot. Gaz. 21:36. 1896.  
Rosa yainacensis Greene, Pittonia 5:109. 1903.  
Rosa anacantha Greene, Leaflets Bot. Obs. 2: 265. 1902. Rosa muriculata Greene, Leaflets Bot. Obs. 2:263. 1912. Rosa brownii Rydb. Bull. Torr. Club 44:70. 1917. Rosa columbiana Rydb. N. Am. Fl. 22:514. 1918.

Shrub reaching 5 feet, branches erect.

Twigs slender, nearly straight, red sometimes tinged with purple, glabrate. Prickles heavy, laterally flattened, base expanded, elliptic or tear-drop shaped; usually straight, sometimes ascending or recurved, frequently in pairs below the nodes.

X-section round. Pith white, continuous.

Buds often supra-axillary, long ovoid, rosy red, glabrate; scales obcordate or sparsely white ciliate. Leaf rudiments imbricate, leaflets conduplicate.

Leaf scars alternate, low, linear, slightly expanded at bundle traces, reaching more than half way around stem.

Bundle trace scars 3. Phyllotaxy 2/5.

Fruit globose to vertically flattened, without a neck, orange-red, reaching 3/4 inch in diameter, calyx lobes remaining attached, mostly borne singly.

Common, widely distributed.

Rosa pisocarpa Gray. Plate VIII.

Rosa pisocarpa Gray, Proc. Am. Acad. 8:302. 1873. Rosa nutkana var. microcarpa Crepin, Bull. Soc. Bot. Belg. 15:45. 1876. Rosa rivalis Eastw. Bull. Torr. Club 32:198. 1905. Rosa copelandii Greene, Leaflets Bot. Obs.

2:264. 1912. Rosa pringlii Rydb. Bull. Torr.  
Club 44:79. 1917. Rosa chrysocarpa Rydb.  
l.c. 74. Rosa eastwoodiae Rydb. N. Am. Fl.  
22:528. 1817.

Shrub reaching 6 feet, slender, erect.

Twigs slender, lustrous deep mahogany red, glabrous, lenticels minute, white, not raised, inconspicuous. Prickles, if present, gray, slender, straight, needle-like.

X-section round. Pith white, continuous.

Buds small, diverging, supra-axillary, globose to ovoid, blunt, same color as twig. Several exposed scales glabrous, margins minutely white ciliate.

Leaf scars alternate, low, linear, extending more than half way around the stem. Bundle trace scars 3.

Fruit reaching 1/2 inch in length, globose or slightly elongated with a short neck, color, at least in the fall, a clear, translucent dark red. Calyx lobes persistent, upright, sometimes glandular. Often borne several in a corymb.

Rosa durandii Crep. Saber-thorned rose. Plate VIII.

Rosa durandii Crep. Bull. Soc. Bot. Fr. 22:19.  
1875.

Shrub reaching 9 feet. Heavily armed throughout with huge broad-based prickles as long as 1 1/2 inch in width and length; densely clothed with long needle-like prickles on the basal portion.

Twigs moderate, red-brown, well armed with gray highly

compressed prickles located roughly in pairs. Tips of twigs pubescent and glandular.

Buds small, diverging, supra-axillary, same color as twig.

Exposed scales several.

Fruit globose, one to several in a corymb, reaching  $\frac{3}{4}$  inch in diameter.

Roadsides with other roses, not common.

### Prunus L.

Shrubs or trees. Twigs slender to moderate, round or angled from nodes. Pith pale to brown, continuous. Buds sessile, mostly ovoid with several exposed scales, morphologically petioles. Leaf scars alternate, raised, small, half round to half elliptical. Bundle trace scars 3. Stipule scars present.

Prunus demissa (Nutt.) Dietr. Western chokecherry.

Plate IX.

Cerasus demissa Nutt. in Torr. and Gray, Fl. N. Am. 1:411. 1840. Prunus demissa Walp. Rep. 2:10. 1847. Padus demissa M. Roem. Fam. Nat. Syn. 3:87. 1847. Prunus virginiana L. var. demissa Torr. Bot. Wilkes Exp. 284. 1874. Padus virginiana Schn. Ill. Handb. Laubk. 1:642. 1906.

Shrub or small tree reaching 25 feet. Crown spreading, main stems mostly erect. Bark smooth or scaly, red-brown to brown.

Twigs moderately slender to stout, scarcely whip-like as in P. emarginata, red-brown to orange-brown, glabrous or



## Plate VIII

37. Rosa rubiginosa L. Sweetbriar.
38. Rosa nutkana Presl. Common wild rose.
39. Rosa gymnocarpa Nutt. Wood rose.
40. Rosa durandii Crepin Saber-thorned rose.
41. Rosa pisocarpa Gray.

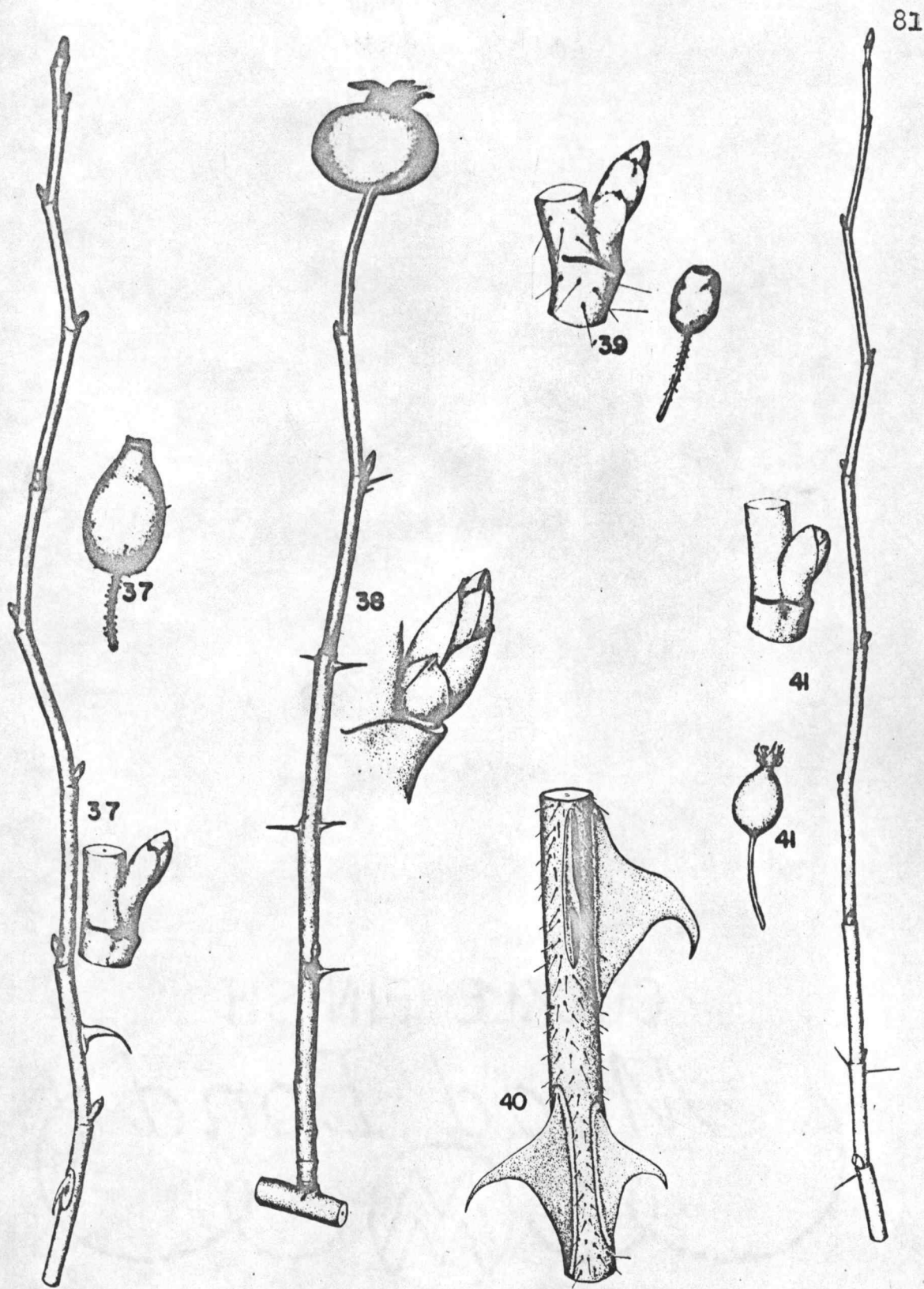


PLATE VIII

pubescent at first. Lenticels many, not conspicuously raised at first, mostly vertically elongated. Older portions of epidermis turning silvery gray but not exfoliating. Spurs formed.

X-section round. Pith pale brown, 5-angled, continuous.

Bark bitter, odor strong but not particularly unpleasant.

Buds reaching 1/2 inch, terminal larger than laterals, apical internode shortened so that it may appear multiple; laterals slightly diverging, ovoid, acute, brown with a dull luster. Scales many, lowermost swollen at base, acute-tipped and obcordate, broad at tip, margins scarious, serrate, sometimes glandular. Inner bud scales covered with sticky resin, leaf rudiments imbricate, immersed in the sticky substance.

Leaf scars alternate, raised, 3 lobed or triangular. Bundle trace scars 3. Phyllotaxy 2/5.

Fruiting structures racemes.

Common.

Prunus emarginata Walp. Wild cherry. Plate IX.

Cerasus emarginata Dougl. Fl. Bor. Am. 1:169. 1834. Cerasus mollis Dougl. l.c. Prunus emarginata Walp. Rep. 2:9. 1843. Prunus mollis Walp. l.c. Cerasus erecta Presl. Epim. Bot. 194. 1849. Cerasus glandulosa Kell. Proc. Calif. Acad. 1: 69. 1855. Cerasus pattoniana Carr. Rev. Hort. 135. 1872. Cerasus californica Greene, Fl. Fr. 50. 1891. Cerasus arida Greene, Proc. Biol. Soc. Wash. 18:57. 1905. Cerasus prunifolia Greene, l.c. Cerasus rhamnoides Greene, l.c.



58. Cerasus kelloggiana Greene, l.c. Cerasus obliqua Greene, l.c. 59. Cerasus parvifolia Greene, l.c. Prunus erecta Walp. Ann. 3:854.

Shrubs or small trees reaching 50 feet. Branches slender tending to be upright, crown symmetrical. Bark brown to red-brown, smooth.

Twigs slender, whip-like, new growth mostly glabrous but occasionally gray woolly, usually lustrous orange-brown, lenticels many, low, conspicuously pale, usually elongated horizontally. Epidermis on older portions turning silvery gray but soon peeling horizontally, leaving the bark lustrous brown with tints of red or orange.

X-section round or angled from the nodes. Pith brown, continuous, 5-angled. Bark bitter, odor strong, almost fragrant.

Buds under 1/4 inch, terminal scarcely larger than laterals, apical internode shortened so that it may appear multiple. Buds conical, appressed slightly. Scales mostly obcordate, acute, lowermost swollen at base, glabrous, sometimes keeled, margins scarious, serrate or glandular.

Leaf scars alternate, raised, 3 lobed or triangular, sometimes covered by a closely adherent petiole cap. Bundle trace scars 3. Phyllotaxy 2/5.

Fruiting structures corymbose.

Margins of woods and along streams.

## ANACARDIACEAE

Rhus L.

Shrubs, small trees or vines; when cut exuding a sometimes poisonous sap. Pith moderately large, round, continuous. Buds moderate to small, solitary, pubescent scales often poorly formed or absent. Leaf scars alternate, slightly raised. Bundle trace scars variable in number in different groups, single or grouped.

Rhus diversiloba T. and G. Poison oak. Plate IX.

Rhus lobata Hook. Fl. Bor. Am. 1:127, 1830, not Poir. 1804. Rhus diversiloba T. and G. Fl. N. Am. 1:218. 1838. Rhus toxicodendron var. diversiloba K. Bdg. Loe. 2:345. 1892. Toxicodendron diversilobum Greene. Lflts. Bot. Obs. 1:119. 1905. Toxicodendron oxycarpum Greene, op. cit. 121. Toxicodendron isophyllum Greene, l.c. Toxicodendron comarophyllum Greene, op. cit. 120. Toxicodendron vaccarum Greene, op. cit. 122. Toxicodendron dryophilum Greene, op. cit. 121.

Erect shrub, a climbing vine reaching a height of 30 to 40 feet, sometimes treelike. Bark gray, rough or warty, Branches of shrubby form ascending closely parallel to main stem giving the plant a characteristic aspect. Twigs moderately stout, short branches developing first year red with predominating overcoating of gray; ribbed from leaf scars; short-pubescent especially near the tip; lenticels numerous, slightly raised producing a distinctive appearance.

X-section round. Pith large, white, crenately round.

Taste undetermined.

Buds naked, sessile, solitary, exuding a small amount of dark brown fluid when broken; exposed leaf rudiments densely pubescent with appressed short stiff hairs.

Leaf scars alternate, low, broadly U-shaped. Bundle trace scars 5, many small auxillary traces. Phyllotaxy 2/5.

Stipule scars small.

Fruit a panicle of dry drupes, compressed, grooved, gray-white.

A highly poisonous skin irritant, identified quickly in the field by the uniform gray color, roughened appearance of twigs from the raised lenticels, and, in the shrubby form the habit of the branches growing parallel to the main stem.

## CELASTRACEAE

### Euonymus L.

Shrubs or small trees. Twigs mostly 4 ribbed or some cylindrical, characteristically green. Buds sessile, scales serrulate. Leaf scars half round or half elliptical, small, elevated. Bundle trace scars single, horizontally elongated toward upper margin leaf scar. Stipule scars minute. Also spelled Evonymus.



Euonymus occidentalis Nutt. Western burning bush.

Plate IX.

Euonymus occidentalis Nutt. Pac. R. Rep.  
4:74. 1856. Euonymus parishii Trel., Trans.  
Acad. Sci. St. Louis, 5:354. 1889.

Shrub reaching 15 feet. Branches slender, weak, drooping.

Bark smooth gray.

Twigs 4-angled, green the first season, turning gray; slender, glabrous.

X-section 4-angled.

Buds 1/4 to 1/2 inch long, narrow, purple, 2 scales exposed.

Leaf scars opposite or nearly so, raised, covered by a petiole cap. The pairs of leaf scars not connected around the stem. Bundle trace scar single, horizontally elongated, at upper margin of leaf scar.

Along shady streams in northern Oregon, not common.

## ACERACEAE

### Acer L.

Shrubs or trees. Twigs stout to moderate, nearly round to obscurely 6-angled in X-section. Pith round, continuous, pale. Buds solitary or laterally multiple, ovoid to conical, sometimes distinctly stalked, 2 or more visible scales, morphologically petioles, one or more of outer scales frequently tipped with leaf-blade rudiments;

## Plate IX.

42. Prunus emarginata Walp. Wild cherry.
43. Prunus demissa Dietr. Western chokecherry.
44. Rhus diversiloba Torr. and Gray. Poison  
oak.
45. Euonymus occidentalis Nutt. Western burning  
bush.

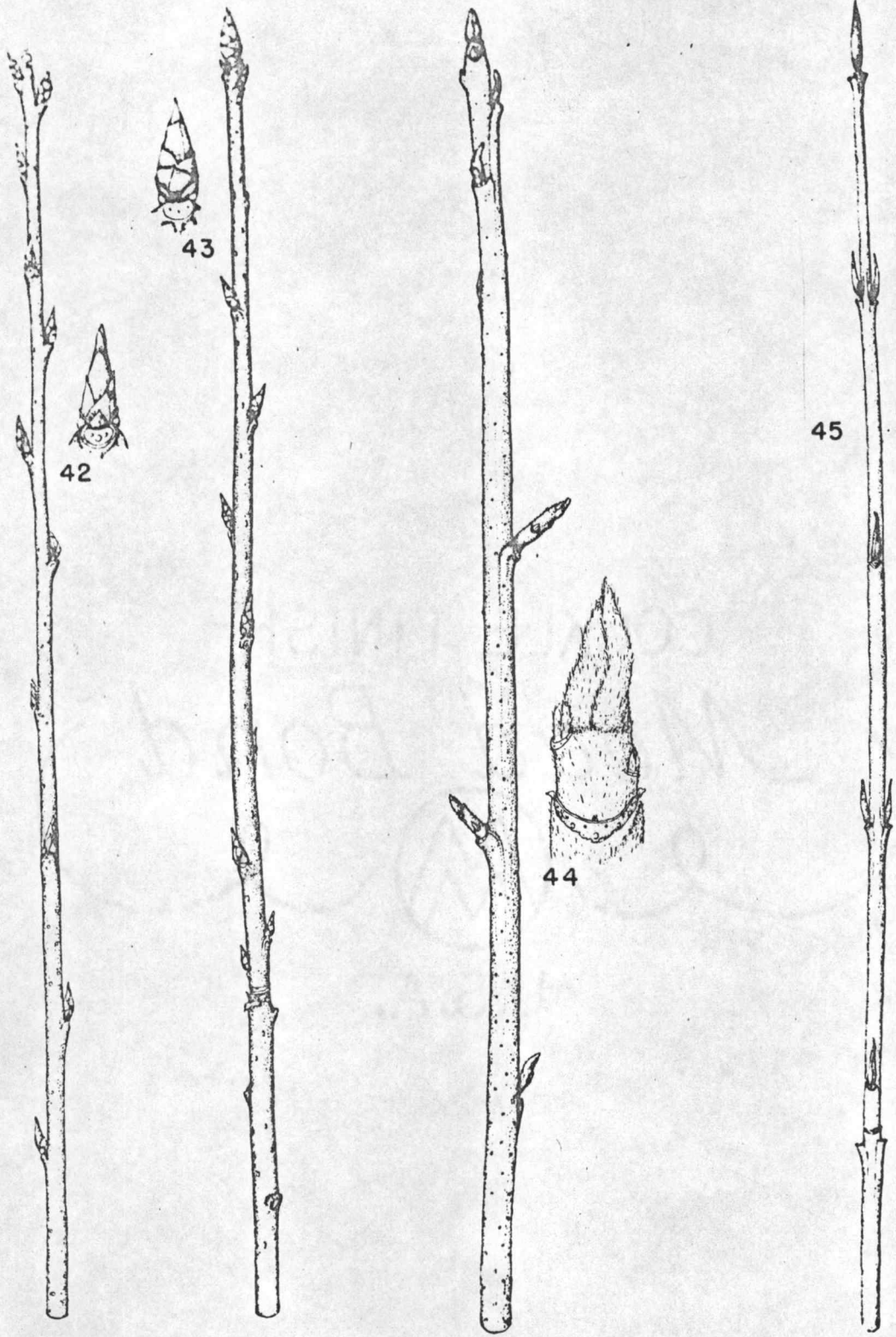


PLATE IX



inner scales commonly markedly accrescent. Leaf scars U to V shaped. Bundle trace scars 3 or more. Stipule scars lacking.

Acer macrophyllum Pursh. Big leaf maple. Plate X.

Acer macrophyllum Pursh, Fl. Am. Sept. 1:267.  
 1814. Acer palmatum Raf. New Fl. An. 1:48.  
Acer flabellatum Greene, Lflts. Bot. Obs. 2:249.  
 1912. Acer coptophyllum Greene, l.c. 250.  
Acer platypterum Greene, l.c. Acer auritum  
 Greene, l.c. 251. Acer stellatum Greene, l.c.  
 252. Acer hemionitis Greene, l.c. Acer dactylon  
Greene, l.c. Acer politum Greene, l.c.  
 254.

Trees reaching 100 feet under favorable conditions.

Branches large, crown round topped, dense. Bark on old trunks pale, gray to red-brown, rough with scaly ridges, or smooth and checkered when young.

Twigs stout, new growth red or green, glabrous, lustrous; numerous small pale vertically elongated lenticels, not raised.

X-section round or oval. Pith large, round, pale.

Buds increasing in size toward apex from minute to large, terminal bud present, 1/2 inch or less, apical internode suppressed causing terminal bud to appear multiple. Lateral buds appressed, 3 sided, slightly stalked, exposed scales about 4, green or red-brown with pale ciliate margins; tipped with tuft of longer hairs or frequently leaf blade rudiments; buds in axils of outer scales, inner scales densely pubescent; leaf rudiments

conduplicate.

Leaf scars V shaped, low tawny colored, joined around the stem in an ascending point. Bundle trace scars 7.

Fruit a double samara, brown during winter, the veined wings as long as 2 inches, not widely spreading; ovary proper covered with stiff tawny bristles.

Common.

Acer douglasii Hook. Dwarf maple. Plate X.

Acer douglasii Hook. Lond. Journ. Bot. 6:77. pl. 6. 1846. Acer glabrum subsp. douglasii Wesml. Bull. Bot. Belg. 29:46. 1890. Acer glabrum var. douglasii Dippel, Handb. Laubh. 2:438. 1892.

Shrubs or small trees ranging from 6 to 30 feet. Branches small, crown narrow. Bark smooth, gray.

Twigs flattened at nodes, smooth, lustrous, glabrous, red or with shades of purple; lenticels elongate, pale, not raised.

Buds 1/4 inch long, terminal slightly larger than laterals, ovoid, appressed, deep red or purple. Scales 2, sharply keeled, keel extending down stalk.

Fruit a double samara, wings not widely spreading, glabrous. Mountains along streams.

Acer circinatum Pursh. Vine maple. Plate X.

Acer circinatum Pursh. Fl. Am. Sept. 1:267. 1814.

Shrub or occasionally a small tree, ranging from 3 to 30 feet, sometimes sprawling, vine-like and rooting at nodes. Much branched, branches crooked, irregular in shape. Bark smooth, gray with red tinges.

Twigs slender, much branched in open-grown plants. New growth, glossy red, shading into greenish red, glabrous, occasionally ribbed below junction of leaf scars; lenticels not visible; slightly gummy.

X-section round. Pith 5-angled, continuous.

Buds  $\frac{1}{8}$  inch long, terminal generally absent, lateral buds of first node appearing terminal, enlarged, lower laterals very small. Usually 4 scales visible, red or green at base, glabrous, shining, with white-ciliate margins, and tuft of longer hairs at tip; whole bud subtended by fringe of long white hairs from upper margin of leaf scar.

Leaf scars narrowly linear at base of season's growth, broader approaching the tip, sometimes covered for a time by persisting petiole caps. Bundle trace scars 3.

Fruit a double samara, wings at nearly right angles to petiole, red at maturity becoming tawny, glabrous.

Along streams and in woods, common.



## RHAMNACEAE

Rhamnus L.

Shrubs or small trees. Twigs cylindrical. Pith round in X-section, continuous, solid. Buds naked or scaly, alternate or opposite. Leaf scars slightly raised. Bundle trace scars 3. Stipule scars minute.

Rhamnus purshiana DC. Cascara, Chittum. Plate X.

Rhamnus alnifolia Pursh, Fl. An. Sept. 1:166. 1814, not L'Her, 1788. Rhamnus purshiana DC. Prod. 2:25. 1825. Rhamnus aronaefolia Greene, Pitt. 3:16. 1896.

Shrub or small tree reaching 35 feet or more. Crown tending to be pyramidal. Bark smooth, gray, sometimes with brown tints.

Twigs moderately slender, dark red-brown, sometimes dull luster on lower portions, short gray pubescence above, occasionally becoming velvety toward ends, obscurely ribbed from stipule scars, keeled below leaf scar; lenticels small, pale, vertically elongated. Branching the first season, branches 4 ranked, leaf scars frequently displaced to one side of the branch base.

X-section round. Pith moderately large, round, pale with darker center, continuous.

Buds naked, leaf rudiments tawny, covered by short stiff rusty pubescence, conduplicate. Lateral buds small,

becoming stalked in spring as shoot elongation begins before expansion of leaf rudiments. Buds of peculiar construction: internodes of twig progressively shortened, passing into partially elongated lower internodes of terminal bud; leaves tardily deciduous, likewise passing into partially expanded lower leaf rudiments of bud. Leaf scars small, raised, oval to broadly lunar, grouped in decussate pairs, phyllotaxy 2/4, apparently leaf scars originally opposite, the units of each pair now having become separate. Oval stipule scars present. Common.

Ceanothus L.

Shrubs or small trees with spreading branches. Twigs slender, cylindrical, green or brown, ours with minute glandular blisters. Pith white, continuous, round in X-section. Buds small, branches often developing the first year. Bud scales morphologically stipules, only lower scales distinct, usually exposing the very hairy leaf rudiments. Leaf scars raised, small, half round. Bundle trace scars 1 to 3. Stipule scars present.

Ceanothus integerrimus H. and A. Deer brush. Plate X.

Ceanothus integerrimus H. and A., Bot. Beechy Voy. 329. 1839-40. Ceanothus californicus Kell. Proc. Calif. Acad. 1:55. 1855. Ceanothus thyrsiflorus var. macrothyrsus Torr. Bot. Wilkes Exped. 263. 1874. Ceanothus andersonii Greene, Lflts. Bot. Obs. 1:66. 1904. Ceanothus

peduncularis Greene, l.c. 67, perhaps.

Shrubs 3 to 8 feet tall, with widely diverging, pliant, drooping branches. Bark red-brown becoming gray.

Twigs very slender, sparsely puberulous, rough with minute glandular blisters, ribbed from leaf scars, mostly dull red, sometimes green or nondescript dark color becoming smooth dull red-brown on older portions. Branchlets ascending.

X-section round or faintly angled. Pith white, round, continuous.

Buds 1/8 inch or less, appressed, terminal bud larger, poorly covered by several narrow acuminate keeled scales, sparingly pubescent, brown usually black tipped, margins scarious, densely pubescent leaf rudiments exposed, longer than scales.

Leaf scars alternate, sometimes covered by a petiole cap, half round to elliptical. Phyllotaxy 2/5. Bundle trace scars 3.

Fruiting panicle often persistent with remains of 3 lobed capsule.

Dry hillsides.

Ceanothus sanguineus Pursh. Oregon tea. Buckbrush.

Plate X.

Ceanothus sanguineus Pursh, Fl. Am. Sept. 1:167.  
1814. Ceanothus oreganus Nutt. Fl. N. Am. 1:265.  
1838.



Shrub reaching 9 feet tall, slender, red or occasionally green branches with a gray or dark overcoating.

Twigs moderately slender, dull, dark or deep maroon red, green on shaded portions, glabrous, roughened by many minute dark glandular blisters.

X-section round. Pith white, crenately round, continuous.

Bark astringent and bitter.

Buds becoming long-stalked by spring, flower buds globose, terminal and other leaf buds conical, protected by several stipular scales, broad, acute, keeled, margins scarious, outer scales sparingly pubescent, inner scales densely woolly.

Leaf scars alternate, raised, minute, half round, often with a persistent petiole cap. Bundle trace scars 3.

Phyllotaxy 2/5. Stipular scars long-linear.

Remains of fruiting panicles sometimes persisting for more than a season. Capsule 3-lobed, corcumscissile.

Common.

#### ARALIACEAE

##### Oplopanax Koch.

Stout erect shrubs, leaf scars alternate.

Oplopanax horridum (Sm.) Miquel. Devil's club. Plate XI.

Panax horridum Sm., Rees' Cycl. 26:10. 1812.

Aralia erinacea Hook. Edinb. Journ. Sci. 6:64.

## Plate X.

46. Acer macrophyllum Pursh. Large-leaved maple.
47. Acer douglasii Hook. Dwarf maple.
48. Acer circinatum Pursh. Vine maple.
49. Rhamnus purshiana DC. Cascara. Chittum.
50. Ceanothus integerrimus Hook. and Arn.
51. Ceanothus sanguineus Pursh. Oregon tea

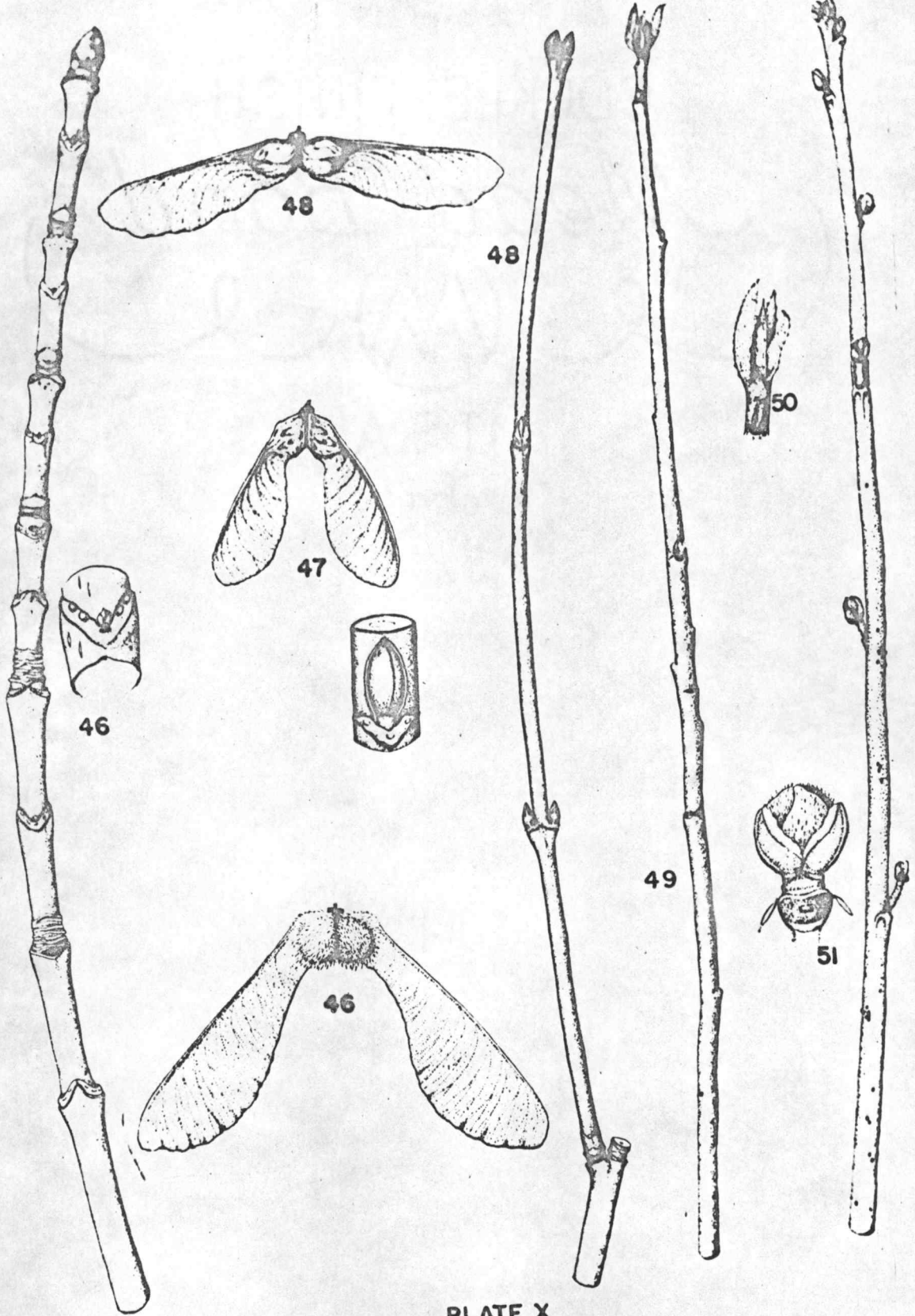


PLATE X



1827. Echinopanax horridum Dec. and Planch.,  
 Rec. Hort. 3:105. 1854. Oplopanax horridum  
 Miquel. Ann. Mus. Bot. Lugd. Bot. 1:16. 1863.  
Fatsia horrida Benth. and Hook. Gen. Pl. 1:939.  
 1867. Ricinophyllum horridum Nels and MacBr.  
 Bot. Gaz. 61:45. 1916.

Stout erect shrubs from 3 to 12 feet. Stems mostly un-  
 branched, cane-like, 1/2 inch or more in diameter, straw  
 colored, densely covered with cortical prickles 1/2 inch  
 long, arranged in spiral series on the internodes, sub-  
 tending leaf scars and surrounding the buds.

X-section round. Wood thin; pith large, white, continuous.  
 Terminal bud well developed, conical, over 1/2 inch long,  
 laterals small except occasionally uppermost ones,  
 hidden beneath a collar of closely appressed prickles,  
 scales brown papery, outer 2 loose.

Leaf scars alternate, U-shaped, bundle trace scars about  
 13 in a single series. Stipule scars lacking. Phyl-  
 lotaxy 2/5.

Moist woods.

## CORNACEAE

### Cornus L.

Small trees and shrubs with slender curved branches.  
 Pubescence often appressed, hairs attached at center.  
 Bark mostly smooth. Buds naked or with poorly developed

scales, mostly stalked. Leaf scars opposite, joined around stem, petiole caps persistent first season. Bundle trace scars 3. Stipule scars lacking.

Cornus nuttallii Aud. Common dog-wood. Flowering dog-wood.

Plate XI.

Cornus nuttallii Aud., Fl. N. Am. 1:652. 1840.  
Cynoxylon nuttallii Shafer; Britt. N. Am.  
 Trees. 746. 1908.

Small tree reaching 40 feet, often straggling. Bark smooth, gray.

Twigs slender, curved between the long nodes, mostly dull gray, red or green occasionally on new growth. At first pubescent with short appressed 2-branched hairs, becoming glabrous.

X-section round or obscurely 6-angled. Pith oval or 6-angled, spongy, pale brown.

Leaf buds narrow, 1/4 inch or more long, usually with 2 pairs narrow keeled, green red or purple scales, covered by gray closely appressed, short stiff recurved hairs. Flower buds with 2 scales opening early exposing a hemispherical, long stalked bud, 1/2 inch in diameter, the 2 scales persisting at the base, leaf buds in their axils.

Leaf scars opposite, not raised, narrowly triangular, petiole caps persisting the first season. Bundle trace scars 3.

Common, especially along streams in the mountains.

Cornus stolonifera Michx. Plate XI.

Cornus stolonifera Michx. Fl. Bor. Am. 1:92.  
1803. Cornus serica var. occidentalis Torr. and  
Gray, Fl. N. Am. 1:652. 1840. Cornus californica  
Mey. Bull. Acad. St. Petersb. Phys.-Math. 3:372.  
1845. Cornus pubescens Nutt. N. Am. Sylva. 3:54.  
1849. Cornus torrei Wats. Proc. Amer. Acad. 11:  
145. 1876. Cornus greenei C. and E. Bot. Gaz.  
16:36. 1890. Cornus occidentalis Coville,  
Contr. U.S. Nat. Herb. 4:117. 1893. Svida  
stolonifera Rydb. Bull. Torr. Club. 31:572. 1904.  
Svida californica Abrams, Bull. N. Y. Bot. Gard.  
6:429. 1910. Cornus alba sub. stolonifera  
Wangerin Pflanzenreich 4:53. 1910. Cornus in-  
stoloneus var. californica McMinn, Ill. Man.  
Calif. Shrubs 377. 1939. Cornus serica sub.  
stolonifera Fosberg, Bull. Torr. Club 69:587.  
1942.

Shrubs reaching 15 feet. Bark thin, brown, smooth or scaly  
on mature specimens.

Twigs slender, red with purple tints, lustrous, short  
white appressed straight 2-pointed hairs near tips and  
upper nodes. Ribbed below leaf scars.

X-section round. Pith 6-angled, white, continuous.

Buds about 1/4 inch long, short stalked, appressed, covered  
by 2 dark colored scale-like leaves with pale pubescence.  
Flower buds terminal, turbinate.

Leaf scars opposite, raised, narrowly V-shaped, usually  
covered by persistent petiole base. Bundle trace scars

3.

Stream sides.

Two forms are found in our area, typical C. stolonifera



with appressed pubescence and a second form (C. pubescens Nutt., and C. californica Mey), with spreading pubescence.

## ERICACEAE

### Menziesia Sm.

Shrubs with slender, cylindrical twigs, bark shredding. Pith small, round, continuous. Buds solitary, sessile, ovoid, small. Terminal and subterminal buds larger with several exposed scales. Leaf scars crowded near tips, small, tending to be 3 sided or the lower transverse. Bundle trace scar single. No stipule scars.

Menziesia ferruginea Sm. Fool's huckleberry. Plate XI.

Menziesia ferruginea Sm., Ic. Pl. 3:pl. 56.1791.  
Menziesia urceolaris Salisb. Par. Lond. pl. 44.  
 1806. Menziesia glabella Gray, Syn. Fl. 2:39.  
 1878.

Shrub reaching 6 feet, erect. Bark red-brown, shredding.

Branches often grouped, appearing whorled.

Twigs slender, rigid, short pubescent. Faintly lined from leaf scars. Internodes greatly shortened near tips.

Bark becoming shreddy second or third season, inner bark dark red-brown.

X-section round. Pith small, pale brown, continuous.

Buds conical acute, about 1/4 inch long, terminal bud

larger, 3 or 5 visible scales, short pubescent, strongly keeled, at least the lowest scales with long yellow ciliate margins. Most buds located near end of the twigs, lower buds not greatly developed.

Leaf scars alternate, shield shaped to transverse at base of season's growth, continuous with epidermis and exfoliating with it on older stems leaving only the single bundle trace scar visible on lower portions of the plants. Stipule scars lacking.

Fruit a 5-loculed capsule splitting apart at maturity and persisting like a small brown flower during the winter. Along the coast and in the Cascades.

Cladothamnus Bong.

Erect branching shrubs, leaf scars alternate. Fruit a depressed-globose capsule, the 5 to 6 locules partially splitting apart at maturity.

Cladothamnus pyrolaeiflorus Bong. Plate XI.

Cladothamnus pyrolaeiflorus Bong., Mem. Acad. St. Petersburg. VI. 2:155. 1832. Tolmiea occidentalis Hook. Fl. Bor. Am. 2:45. 1834.

Shrub as tall as 6 feet, branches erect, rigid. Bark exfoliating.

Twigs straight, dark red-brown becoming glaucous and gray, angled, glabrous except short spreading red-brown pubescence along ridges. Bud scales persisting. Bark

## Plate XI

52. Oplopanax horridum Miquel. Devil's club.
53. Cornus nuttallii Aud. Common dog-wood.
54. Cornus stolonifera Michx. Creek dogwood.
55. Menziesia ferruginea Smith. Fool's  
huckleberry.
56. Cladanthamnus pyrolaeiflorus Bong. Copper  
rhododendron.



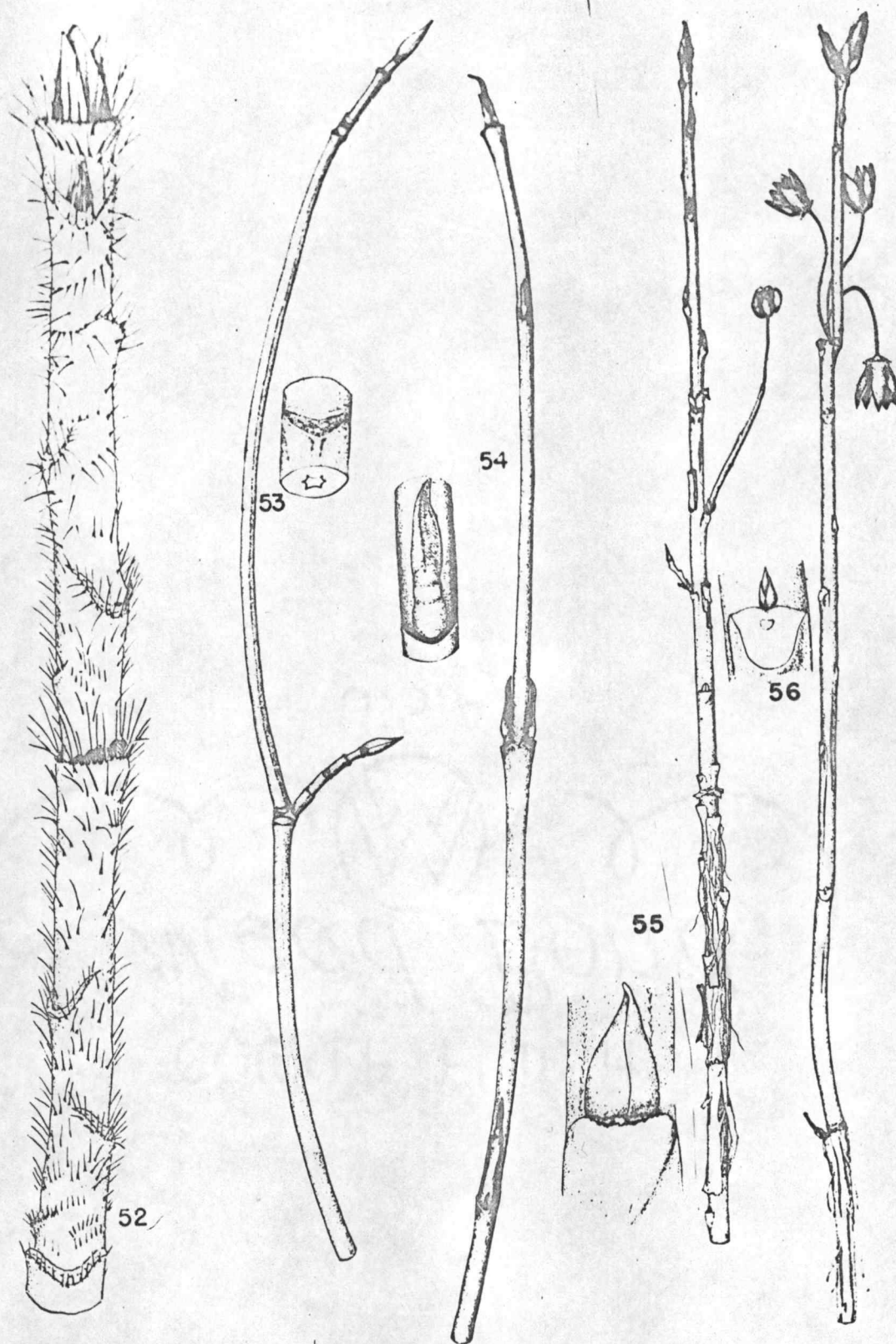


PLATE XI

exfoliating and shredding after first year, inner bark red-brown.

X-section angled. Pith brown.

Buds 1/8 inch or less, ovoid, acute, glabrous; scales 2 keeled; margins scarious.

Leaf scars alternate, low, covered by torn epidermis, single bundle trace protruding. Phyllotaxy 2/5.

Stipule scars none.

Known in northwestern Oregon only from Saddle Mountain in Clatsop County.

#### Vaccinium L.

Low shrubs, slender, usually angled twigs. Pith small, continuous. Buds small, solitary, sessile, 2 subvalvate to several imbricate scales, terminal bud wanting. Leaf scars alternate, small, raised. Bundle trace scar 1. Stipule scars lacking.

Vaccinium caespitosum Michx. Plate XII.

Vaccinium caespitosum Michx. Fl. Bor. Am.  
1:234. 1803.

Low densely tufted shrub, 1 1/2 feet or less in height.

Twigs slender, rigid, orange-brown, neither angled nor ribbed, sparingly pubescent with minute, hooked hairs pointing upwards. Bark exfoliating near base.

X-section nearly round. Pith small.

Buds small, mostly under 1/8 inch, appressed, ovoid, with

blunt, glabrate, lustrous orange-brown. Visible scales 2, subvalvate, brown shading to red, not keeled.

Leaf scars alternate, greatly raised, half round to elliptical, sometimes covered by a small petiole cap. Bundle trace scar single. Phyllotaxy 2/5.

Mountains.

Vaccinium occidentale Gray. Plate XII.

Vaccinium occidentale Gray, Bot. Cal. 1:451.  
1876.

Low rigid shrub reaching 3 feet, branches dense. Bark gray, exfoliating and shredding leaving smooth red-brown inner bark.

Twigs slender, rigid, unlined, sometimes with slight bloom at tips, glabrous, new growth pale orange-brown turning dark gray, bark exfoliating exposing smooth red-brown stem. Bud scales persistent.

X-section round.

Buds 1/16 inch, appressed, globose. Scales several, 2 visible, at first, soon exposing inner scales, bluntly keeled, glabrous, sometimes with a bloom.

Leaf scars alternate, half round, raised, small petiole cap sometimes present. Bundle trace scar single.

Mountain swamps.

Vaccinium uliginosum L. Western blueberry. Plate XII.

Vaccinium uliginosum L. Sp. Pl. 350. 1754.



Low shrub reaching 3 feet, abundantly branched, decumbant or erect. Bark brown or dark gray.

Twigs slender, orange-brown turning gray or red-brown, not ribbed, pubescence stiff white spreading. Bark becoming shreddy. Bud scales persisting.

X-section round.

Buds 1/16 inch, ovoid, diverging, brown, shining; 4 to 6 exposed scales acute, mostly glabrous, strongly keeled. Inner scale hood-like over top of bud.

Leaf scars alternate, raised, half round to crescent shaped.

Bundle trace single. Phyllotaxy 2/5.

Coastal and mountain swamps.

Vaccinium myrtillus L. Small red huckleberry. Plate XII.

Vaccinium myrtillus L., Sp. Pl. 349. 1754.  
Vaccinium microphyllum Rydb. Bull. Torr. Bot. Club 24:251. 1891, not Reinw. 1826. Vaccinium scoparium Leigerg., Mazama. 1:196. 1897.

Low wispy shrub less than 2 feet tall. Branches dense, green, upright.

Twigs very slender, frequently twisted, sharply angled and winged, green, with sparse long soft white hairs.

X-section 5-angled. Pith small white 5-angled, continuous.

Buds 1/16 inch long, yellow, appressed, ovoid, acute, 2 exposed scales imbricate at base, subvalvate above, glabrous or with long fine hairs.

Leaf scars alternate, raised, oval, sometimes with small petiole cap. Bundle trace scar single. Phyllotaxy 2/5.

Mountains.

Vaccinium parvifolium Sm. Red huckleberry. Plate XII.

Vaccinium parvifolium Sm., Rees' Cycl. 36(3).  
1819.

Shrub, irregular form, reaching 15 feet.

Twigs moderately sized, sinuous, bright green, sharply 5-angled, stiff, diverging or curving upwards, glabrate or with sparse minute hairs. Lenticels inconspicuous. X-section 5-sided. Pith green, irregularly shaped, often excentric, continuous.

Buds 1/4 inch long or less, ovoid, appressed, tips flattened; 2 exposed scales imbricate at base, subvalvate above, red or rosy.

Leaf scars alternate, raised, sometimes with small petiole cap. Bundle trace scar single. Phyllotaxy 2/5.

Common.

Vaccinium membranaceum Dougl. Mountain huckleberry.

Plate XII.

Vaccinium myrtilloides macrophylla Hook. Fl. Bor. Am. 2:32. 1834. Vaccinium membranaceum Dougl. l.c. as synonym. Vaccinium macrophyllum Piper, Cont. U. S. Herb. 11:443. 1906.

Shrub reaching 5 feet, mostly shorter, branches slender, erect or spreading. Bark gray, shredding, exfoliating. Twigs slender, gray-straw-colored to deep red, sharply angled, ribbed below leaf scars, glabrous or pubescent with minute curved hairs turning upwards.

X-section 5-angled. Pith oval or irregular in shape, green.

Buds 1/8 inch, appressed, acute, flattened at tips, 2 exposed scales imbricate at base, subvalvate above, glabrous, keeled, mostly pale red, inner scales pink.

Leaf rudiments imbricate.

Leaf scars alternate, raised, small petiole cap persisting.

Bundle trace scar single.

Mountains, 3,000 feet and above.

Vaccinium deliciosum Piper. Plate XII.

Vaccinium deliciosum Piper, Mazama, 2:103. 1901.

Low shrubs 1 foot or less in height, tending to be prostrate.

Short rigid erect branches, gray or red-brown bark.

Twigs slender, strongly ribbed below leaf scars, red-brown, glabrate, occasionally with short stiff white pubescence turned upwards. Bark exfoliating after several seasons.

X-section 5-angled.

Buds under 1.8 inch in length, appressed, not flattened at tips, ovoid. 2 exposed scales glabrous, shining, not keeled, same color as twig.

Leaf scars alternate, raised, crescent shaped, small petiole cap persisting. Bundle trace scar single. Phyllotaxy

2/5.

High Cascades.



Vaccinium ovalifolium Sm. Tall blue huckleberry. Plate XII

Vaccinium ovalifolium Sm., Rees' Cycl. 36(2)  
1817.

Shrub reaching 6 feet, branches slender, straggling. Bark gray.

Twigs slender, sharply 5-angled, strongly ribbed, almost winged, glabrous or glabrate. New growth rosy becoming gray and shreddy.

X-section 5-angled; pith small, white, 5-angled, continuous.

Buds 1/8 inch, last bud a little longer, ovoid, appressed or slightly spreading, tips not flattened; 2 exposed scales, imbricate at base, subvalvate above, keeled, glabrous, rosy.

Leaf scars alternate, crescent-shaped, raised, small petiole cap remaining. Bundle trace scar single. Phyllotaxy 2/5.

Deep woods near coast and in low mountains.

#### OLEACEAE

##### Fraxinus L.

Trees or shrubs. Twigs stout, often compressed at nodes. Pith 6-angled or elliptical. Buds sessile or in some species superposed. Leaf scars opposite, rarely alternate, large and broad, covered by membrane that in some species also partially covers the bud. Bundle trace scars

## Plate XII

57. Vaccinium caespitosum Michx.
58. Vaccinium occidentale Gray.
59. Vaccinium uliginosum L. Western blueberry.
60. Vaccinium myrtillus L. Small red  
huckleberry.
61. Vaccinium parvifolium Smith. Red  
huckleberry.
62. Vaccinium membranaceum Dougl. Mountain  
huckleberry.
63. Vaccinium deliciosum Piper.
64. Vaccinium ovalifolium Smith. Tall blue  
huckleberry.

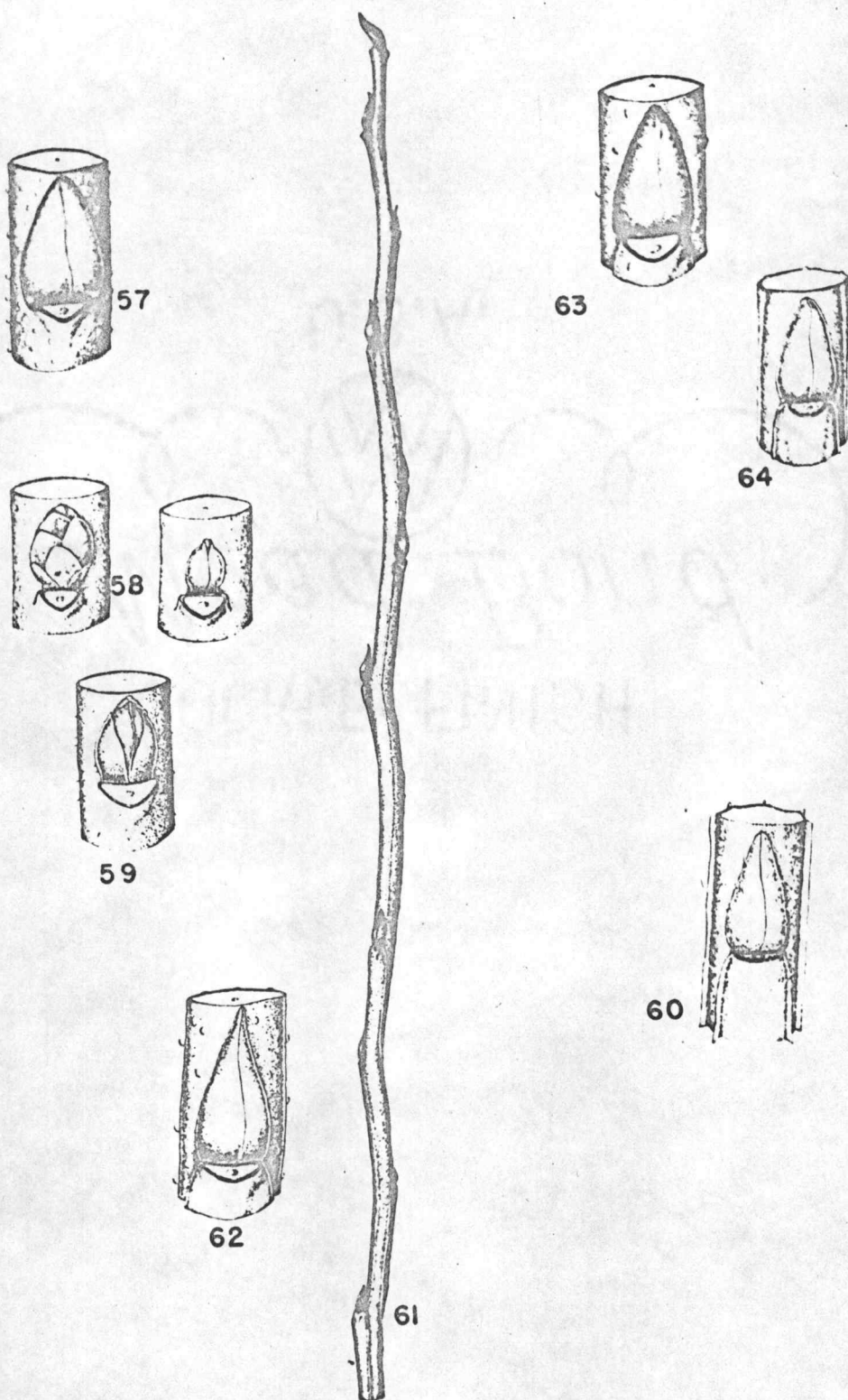


PLATE XII



many. Stipule scars lacking.

Fraxinus oregana Nutt. Oregon ash. Plate XIII.

Fraxinus latifolia Benth. Bot. Sulph. 33. 1844.  
Fraxinus oregana Nutt. N. Am. Sylva 3:59. pl.  
 99. 1849. Fraxinus americana var. oregana  
 Wesmael. Bull. Soc. Belg. 31:110. 1892.

Trees reaching 12 feet. Branches large, crown wide, round topped. Bark thick, deeply furrowed, light gray to gray-brown.

Twigs stout or moderately so, compressed at nodes, red or green becoming brown, finally gray with green tones, sometimes glabrous, generally with white to brown woolly pubescence. Lenticels light, slightly raised, vertically elongated. Bark with astringent taste.

X-section round or oval. Pith moderately large, continuous, 6-angled, white.

Terminal bud 1/4 inch, conical, sometimes subtended by pair of laterals, densely brown scruffy and pubescent. Lateral buds minute, partially covered by membrane.

Leaf scars opposite, large, shield shaped, as long as or longer than broad, covered by a yellowish or tawny membrane. Bundle trace scars many in an ellipse, usually visible through the membrane.

Common along river bottoms and swales.

## CAPRIFOLIACEAE

Lonicera L.

Shrub or twining vines. Twigs round, mostly slender; pith often hollow (in internodes). Buds single or superposed, sessile. Scales 2 or more, opposite, 4-ranked. Leaf scars small on raised petiole bases connected by lines encircling the twigs. Bundle trace scars 3.

Lonicera involucrata Banks. Bush honeysuckle. Twinberry, Inkberry. Plate XIII.

Lonicera involucrata Banks, Bot. App. Frankl. Journ. 733. 1923. Xylosteum involucratum Rich. Bot. App. Frankl. Journ. 733. 1823. Lonicera ledeburyi Esch. Mem. Acad. Petesb. 10:284. 1826.

Shrub reaching 8 feet, erect. Bark smooth, gray or tawny, tending to shred.

Twigs moderately slender, sharply keeled and ribbed below leaf scars, pale orange-brown, glabrous.

X-section round or oval. Pith oval, obscurely 6-angled, white, continuous.

Buds small, laterals 1/8 inch, terminal longer, compressed, appearing triangular, about as high as wide. Scales same color as twigs, glabrous, dry, 2 pairs exposed.

Leaf scars opposite, joined by a narrow line, slightly raised on petiole bases, obscured by a corky callus.

Bundle trace scars 3 along upper margin.

Coastal, along streams and on sand dunes; less common inland.

Lonicera ciliosa Poir. Climbing honeysuckle. Plate XIII.

Caprifolium ciliosum Pursh, Fl. Am. Sept. 1: 160. 1814. Lonicera ciliosa Poir. Encyl. Suppl. 5:612. 1817. Lonicera occidentalis Lindl. Bot. Reg. 17:pl. 14, 57. 1831. Lonicera occidentalis Hook. Fl. Bor. Am. 1:282. 1832.

Vines, climbing or twining, the slender stems as long as 20 feet.

Twigs slender, flexible, straw colored or with purple tints, glabrous except for a few short hairs around buds. Epidermis exfoliating. Bark shredding. Bud scales persisting.

X-section round or oval. Pith white, obscurely angled, hollow in center.

Buds partially hidden behind persisting petiole bases, small, dorsally flattened. Exposed scales 2 to 4, straw colored or tinted with purple, dry, sharply keeled, inner scales green margined with stalked glands; leaf rudiments imbricate.

Leaf scars opposite, joined by a transverse line, raised, obscured by a corky development, roughly triangular.

Bundle trace scars 3.

Margins of damp woods.

Lonicera hispidula Dougl. Pink honeysuckle. Plate XIII.

Lonicera microphylla Hook., Fl. Bor. Am.



1:283. 1832, not Willd. 1819. Lonicera hispidula Dougl., Bot. Reg. 21:pl. 1751. 1836. Caprifolium hispidulum Lindl. l.c.

Stems twining or trailing, reaching 9 feet in length, slender, widely branched, hispid to nearly glabrous, often with stalked glands, purple to straw-colored, lenticels inconspicuous, white, not raised.

X-section round, scarcely woody. Pith white, round or 6-angled, hollow in center.

Buds small, diverging, dorsally flattened. Exposed scales 2 or more pairs, acuminate, strongly keeled, purple and glaucous at first becoming straw colored and dry, margins ciliate, often with stalked glands. Lowest pair of scales saccate at base, pubescent, upper scales glabrous.

Leaf scars opposite, roughly triangular, joined by stipule scars, raised on petiole bases, obscured by corky development, surrounded by a few long, simple, pointed hairs.

Dry rocky locations.

Symphoricarpos L.

Small shrubs with very slender branches, usually pubescent. Pith small, round, brown, usually hollow. Buds small, usually compressed, sessile with about 3 pairs of keeled scales exposed. Leaf scars opposite, small, usually torn, on permanent petiole bases, connected by transverse

lines. Bundle traces indistinct.

Symphoricarpos albus (L.) Blake. Snow-berry. Plate XIII.

Symphoricarpos racemosus Michx. Fl. Bor. Am.  
1:107. 1803. Symphoricarpos albus Koch,  
Dendrol. 2:48. Cerca 1860. Symphoricarpos  
pauciflorus Britt., Mem. Torr. Club. 5:305.  
1894.

Shrub reaching 5 feet, erect, widely branched. Branches very slender, tawny or dead gray, epidermis shredding. At a casual glance may be mistaken for a dead herbaceous weed.

Twigs slender, greatly flattened at nodes, keeled below leaf scars, glabrous, new growth tawny, mostly dull.

X-section round or oval. Pith 6-angled, green, the center hollow.

Buds less than 1/8 inch, globose to ovate, sometimes laterally multiple. Exposed scales several pairs, tawny and papery or green with brown tips, triangular and acute. Terminal bud generally lacking.

Leaf scars opposite, roughly triangular, raised, connected by a flange in transverse line or descending V. Bundle trace scars 3, obscured by corky development, generally only central scar visible.

Fruit globose, white, berry-like, about 1/3 inch diameter.

Common, especially along roadsides with native roses, making an attractive contrast with their scarlet fruits.

## Plate XIII

65. Fraxinus oregona Nutt. Oregon ash.
66. Lonicera involucrata Banks. Bush honeysuckle. Twin berry. Ink berry.
67. Lonicera hispidula Dougl. Pink honeysuckle.
68. Lonicera ciliosa Poir. Climbing honeysuckle.
69. Symphoricarpos albus Blake. Snow berry



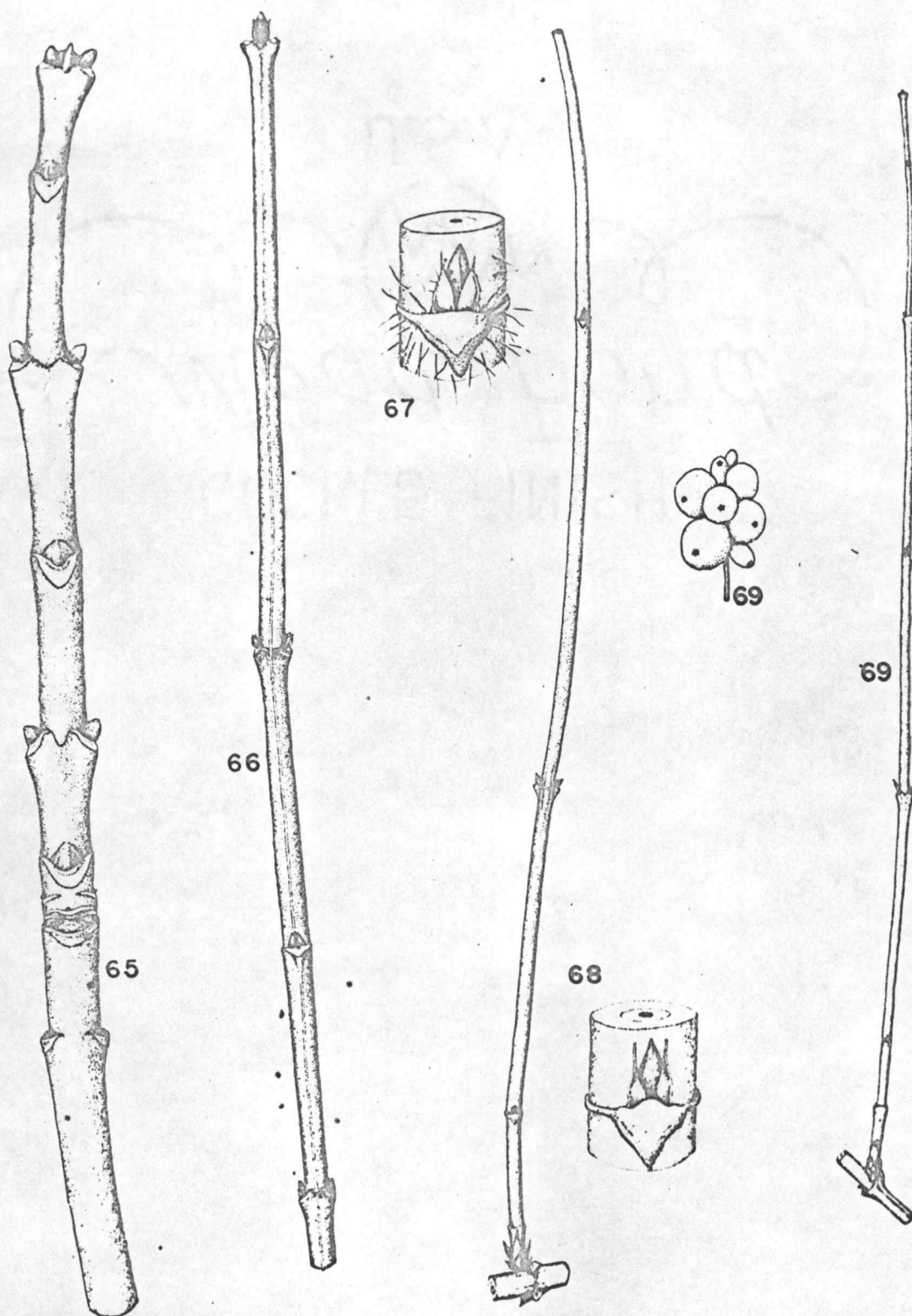


PLATE XIII

Symphoricarpos mollis Nutt. Mountain snow berry.

Symphoricarpos mollis Nutt. Fl. N. Am. 2:4.

1841. Symphoricarpos ciliatus Nutt. l.c.

Shrubs, widely branched, stems about 2 feet long, spreading or nearly prostrate.

Twigs slender, flattened at nodes, keeled and ribbed below leaf scars, short pubescent, tawny with shades of purple turning dark gray, epidermis exfoliating, bark shredding.

X-section round or oval. Pith green or brown, hollow in center.

Buds under 1/8 inch, diverging, dorsally flattened, brown or purple. 2 or 3 pairs scales, acute or acuminate, keeled, margins scarious, ciliate.

Leaf scars opposite, raised, roughly triangular, connected by flange. Bundle trace scars 3, obscured by corky development, seldom more than central trace scar visible.

Fruit globose, white, about 1/4 inch long.

Dry woods, usually at higher altitudes than S. albus.

### Viburnum L.

Shrubs, or some species small trees. Twigs moderate to slender, often 6-angled. Pith moderate, round or 6-angled continuous. Buds mostly stalked, ovoid or oblong. Scales absent, or one pair connate or several free. Leaf scars

opposite. Bundle trace scars 3. Stipule scars lacking.

Viburnum ellipticum Hook. Western wayfaring tree.

Plate XIV.

Viburnum ellipticum Hook. Fl. Bor. Am.  
1:280. 1833.

Shrub reaching 12 feet.

Twigs slender, keeled and ribbed below leaf scars, gray with shades of green or red, glabrous, lenticels minute, slightly swollen, inconspicuous, becoming warty on second year's growth.

X-section round; pith moderately large, white, 6-angled, continuous.

Buds stalked, about 1/4 inch long, terminal longer, flower buds turbinate, leaf buds ovate. Exposed scales in two or more pairs, sometimes keeled, ciliate at tip, glabrous or with scattered hairs, green with red or rosy tips.

Leaf scars narrow, V-shaped, constricted between bundle traces, sometimes subtended by a fringe of long white hairs.

Along streams and edges of deciduous woods, not common.

Viburnum pauciflorum Pylaie. High-bush cranberry.

Plate XIV.

Viburnum pauciflorum Pylaie, Fl. N. Am.  
2:17. 1841.

Shrub reaching 6 or more feet, slender, straggling gray



branches.

Twigs moderately stout to slender, 6-angled, glabrous, light orange to tawny, turning gray, epidermis exfoliating slightly.

X-section 6-angled. Pith large, white, 6-angled, continuous.

Buds stalked, about 1/4 inch long, oblong, blunt. Single pair of connate scales, heavily keeled, glabrous.

Leaf scars opposite, raised, broadly U- to V-shaped, narrow, expanded at bundle traces; bundle trace scars 3, large, raised, horizontally elongated.

Woods in Cascades.

Sambucus L.

Shrubs or small, open-branched trees. Twigs stout, obscurely many angled. Pith very large, continuous. Buds frequently multiple, supra-axillary, occasionally developing the first year, terminal bud usually absent. Leaf scars mostly opposite, very large. Bundle trace scars variable in number, 3, 5, or 7. Stipule scars commonly lacking.

Sambucus caerulea Raf. Blue elderberry. Plate XIV.

Sambucus caerulea Raf., Alsographia Am. 48.  
1838. Sambucus glauca Nutt. Fl. N. An. 2:13.  
1841. Sambucus maritima Greene Man. Bay. Reg.  
1:163. 1894.

Shrub or small tree reaching 25 feet. Branches stout,

spreading, producing a round topped crown. Bark thin, brown, often red tinged, furrowed, ridged in large older specimens.

Twigs stout, obscurely ribbed and bluntly keeled below leaf scars, lustrous olive brown; lenticels numerous, orange, shining, only slightly raised, not breaking epidermis of new growth.

X-section round or obscurely angled. Pith very large, white or discolored in water sprouts, continuous. Unpleasant odor when broken.

Buds conical, diverging, supra-axillary or apparently stalked, generally superposed, rarely laterally multiple also, uppermost bud over 1/2 inch. Exposed scales in several pairs, green turning purple in cold weather, glabrous, apices 3-parted, markedly so in upper scales. Lowest bud scales short, keeled. Leaf rudiments involute. Terminal bud frequently not developing, first internode dying back.

Leaf scars opposite, meeting around the stem, low, very deep vertically, pale in contrast with the twig, upper margin notched, the superposed buds extending into the notch, leaf scar not extending across bud stalk. Bundle trace scars 7, along lower margin of leaf scar.

Moist locations along streams or moist hillsides.

Sambucus callicarpa Greene. Red elderberry. Plate XIV.

Sambucus racemosa aborescens T. and G. Fl. N.

Am. 2:13. 1841, not S. arborescens Gilib.  
1792. Sambucus callicarpa Greene, Fl. Fran. 342.  
1892. Sambucus leiosperma Leiberg. Proc. Biol.  
Soc. Wash. 11:40. 1897. Sambucus arborescens  
How. Fl. N. W. Am. 279. 1900.

Shrub or small tree reaching 20 feet. Branches spreading.

Twigs stout, gray green with a silvery sheen, 8-angled, lenticels raised, breaking through epidermis of last season's growth, pink-brown, vertically elongated, not as numerous as lenticels of S. caerulea but larger and more prominent.

X-section 8-angled, not as definitely woody as S. caerulea.

Pith very large, brown, continuous. Odor unpleasant.

Buds appressed, ovoid and acute, laterally multiple, rarely superposed, main bud over 1/2 inch long. Exposed scales several, pairs, green, exposed portions turning purple in cold weather, glabrous, margins sometimes ciliate; lower pair of scales short, bluntly keeled. Buds sometimes in the axils of lower scales. Terminal bud frequently not developing, first internode dying back.

Leaf scars opposite, low, usually not quite meeting around stem, deeper than broad, upper margin extending over base of bud, not at all notched. Bundle trace scars 5 to 7, along lower margin of leaf scar.

Moist situations.



## Plate XIV

70. Viburnum ellipticum Hook. Western way-  
faring tree.
71. Viburnum pauciflorum Pylaie. High-bush  
cranberry.
72. Sambucus callicarpa Greene. Red  
elderberry.
73. Sambucus caerulea Raf. Blue elderberry.

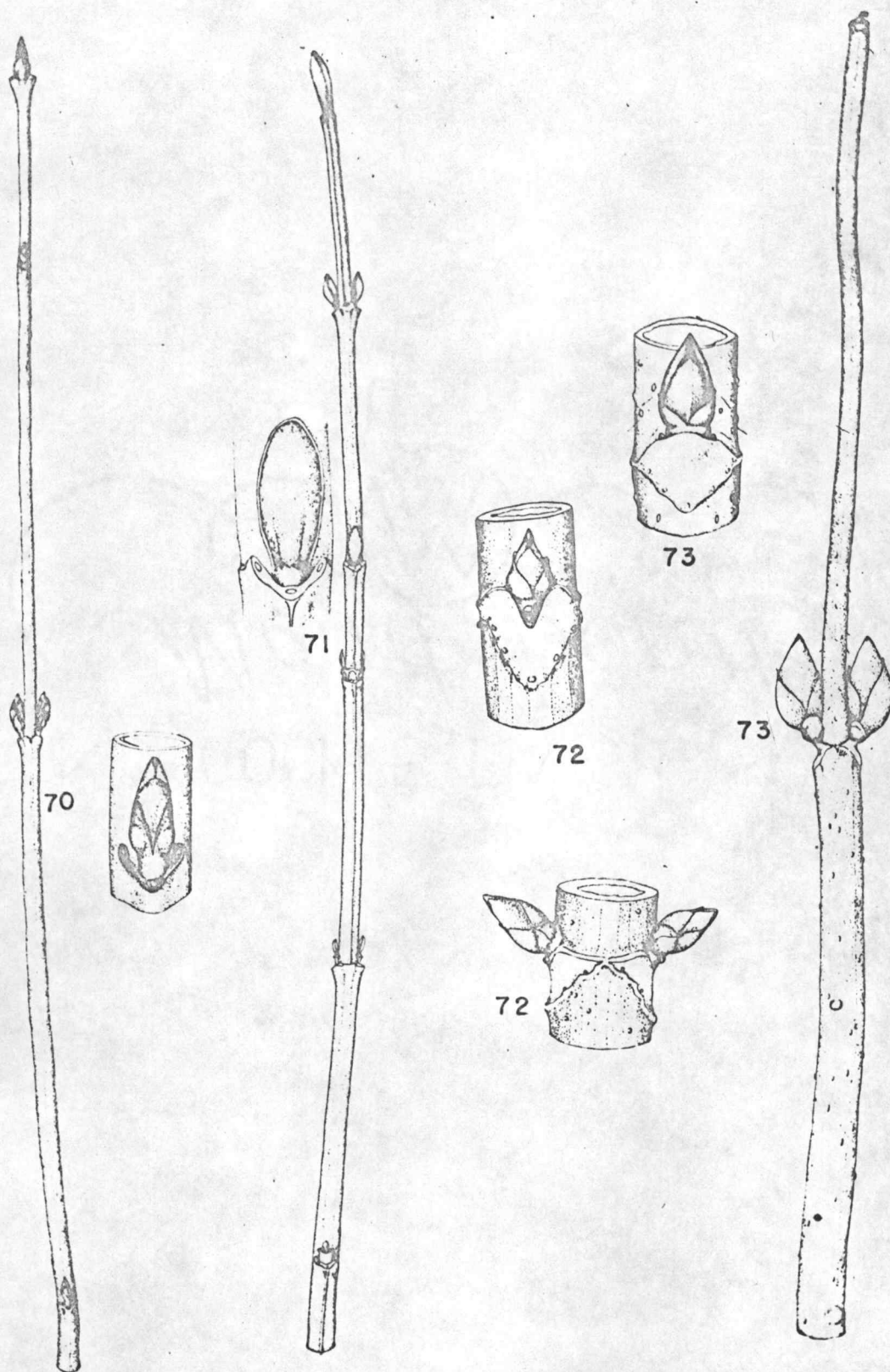


PLATE XIV

## GLOSSARY

- ACCRESCENT - as used here, increasing in size after opening of the bud.
- ACUMINATE - gradually tapering to a long point.
- ACUTE - abruptly ending in a short point.
- AXILLARY - originating in an axil, i.e., the point above the place of attachment of a leaf to the stem.
- CALLUS - thickened protective tissue, usually developing on scars.
- CILIATE - margined with long hairs.
- CIRCUMSCISSILE - dehiscing horizontally, the upper portion of an organ splitting off as a lid.
- CONDUPLICATE - with two halves of a leaf folded together lengthwise.
- CONNATE - united; grown together.
- CORYMB - an inflorescence in which the lower or outer pedicels elongate in such a way as to make it flat-topped.
- CRENATE - with rounded teeth; scalloped margin.
- DEHISCENT - opening at maturity along definite lines.
- DRUPE - pulpy or fleshy, generally single-seeded fruit, with the seed enclosed in a stone.
- EMARGINATE - shallowly notched at apex.
- ENDEMIC - native to a single region.
- ENTIRE - margin smooth; not cut nor toothed.
- EXFOLIATE - to peel off in layers.
- FUSIFORM - gradually tapering from the middle to both ends; spindle-shaped.
- GLABRATE - almost glabrous.
- GLABROUS - without hairs.
- HISPID - with stiff hairs.
- IMBRICATE - overlapping, like shingles.
- INVOLUTE - rolled inwards from the margins.
- LANCEOLATE - broadest near the base and tapering toward the ends, the total length being three to four times the width.
- LOCULE - a cavity of an ovary or a seed pod.
- MEMBRANE - a thin sheet of cells; as used here, a layer of cells extending across a leaf scar and sometimes the accompanying bud, and attached only by its margins, both faces being free.
- OBCORDATE - heart-shaped with the attachment at the point.
- OBTUSE - apex blunt or rounded.
- OVOID - egg-shaped, broadest near the base.
- PANICLE - a branched raceme or corymb.
- PLATTED - folded lengthwise.
- PLICATE - folded lengthwise.
- PRICKLE - an outgrowth of the epidermis; removable with the bark.



- PUBERULOUS - sparsely covered with fine short hairs.  
PUBESCENT - hairy.  
REFLEXED - pointing downward.  
RENIFORM - kidney or bean shaped.  
REVOLUTE - with margins rolled backward or under.  
SAMARA - a winged dry fruit.  
SCARIOUS - thin and dry; papery  
SCURFY - mealy; covered with small scales.  
SERRATE - with small sharp forward-pointing teeth as in  
the edge of a saw.  
SERRULATE - minutely serrate.  
SESSILE - without a stalk.  
SINUOUS - with a wavy margin.  
SPINE - a rigid sharp-pointed structure, morphologically  
a modified branch, leaf, etc.  
SPUR - a branch with highly reduced internodes.  
SUBVALVATE - scarcely overlapping.  
SUPERPOSED - located one above another.  
SUPRA-AXILLARY - originating apparently from a point above  
the axil.  
TERETE - round in cross-section.  
THORN - a rigid sharp-pointed structure, morphologically  
a modified branch, leaf, etc.; a spine.  
TURBINATE - top-shaped.

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