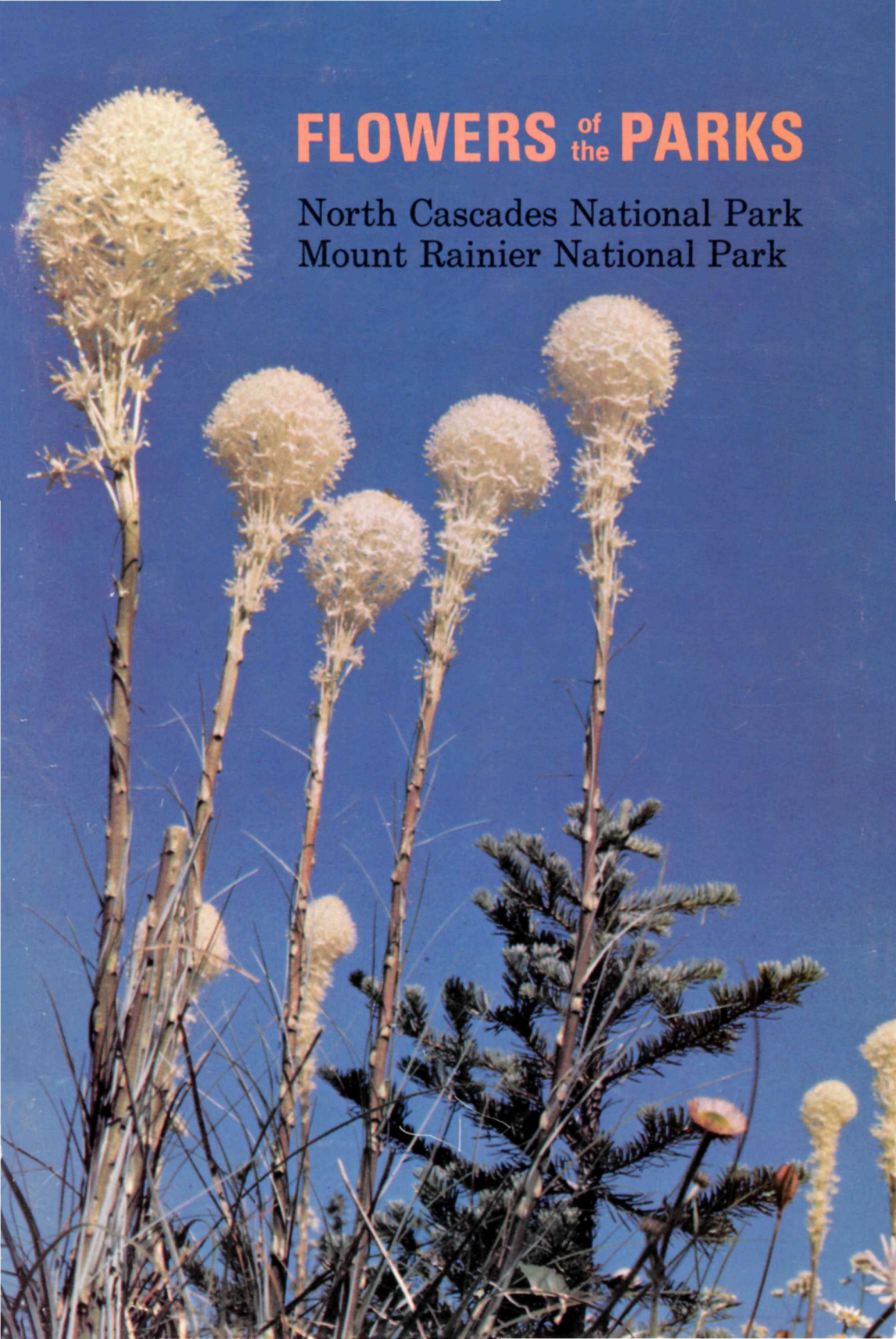


FLOWERS of the PARKS

North Cascades National Park
Mount Rainier National Park



MOUNT RAINIER NATURAL HISTORY ASSOCIATION

A non-profit group to help study and interpret
Mount Rainier National Park for its visitors.

Mount Rainier Natural History Association

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First Edition, June 1972

Manufactured in the United States of America by
Craftsman & Met Press
Seattle, Washington

Book design by Marge Mueller

Library of Congress Catalog Card No. 72-81130



Available from the Mount Rainier Natural History Association, Longmire,
Wa. 98397.

BEARGRASS (cover photo)

Xerophyllum tenax

Lily Family

Flowers from late May to August

Flowers creamy-white, small, densely packed in a ball-shaped cluster which later in the season elongates into a dense raceme up to 15 inches long. Leaves, mostly clumped about the base of the flowering stem with a few smaller ones on the stem, are long and narrow, up to 30 inches in length, with the margins rough because of minute teeth. A flowering plant may grow up to 6 feet tall. The plant is said to die after flowering. The whole flower cluster is sometimes eaten by deer. Found from low elevations to high in the mountains, most often in the silver fir and mountain hemlock and subalpine meadow zones. More commonly flowering in the open. The presence of this species, like the fireweed, sometimes indicates a forest or tree clump was once present but was destroyed by fire, wind, or insects.

FLOWERS OF THE PARKS

Mount Rainier National Park
North Cascades National Park

Text by Jan Henderson
Photos by Bob and Ira Spring
Mount Rainier Natural History Association



**National
Parks
Centennial
1872-1972**

Color plates reproduced from *Wildflowers of Mount Rainier and the Cascades* published by Mount Rainier Natural History Association and The Mountaineers, 1970.

INTRODUCTION

We have published *Flowers of the Parks* to fill the need for an inexpensive, authoritative, full-color guide to wildflowers of Mount Rainier and North Cascades National Parks. It does not replace the larger and more comprehensive *Wildflowers of Mount Rainier and the Cascades*.

We have arranged the plants included into two natural groups: "Flowers of the Forest" and "Flowers of the Meadows." Few plants live indiscriminately in both the cool, shady forest and the open, sunny meadows. Therefore, such categories are easily used to distinguish between two broad ecologic groups. A notable exception is the white rhododendron, which occurs in the forest but is more common in the meadows. Another is beargrass, which is less prominent in the forest and rarely flowers there, but is often conspicuous in the meadows.

Within these two ecologic groups the plants are arranged by the color of their flower or fruit, whichever is most conspicuous. Thus, to find a flower in this book, one need only know (1) whether it grows most commonly in forest or meadows, and (2) the color of the flower or fruit.

The "problem" species, especially on first trials, are those with more than one color. Flowers of the spreading phlox, for example, though most frequently light pink, range from pure white to dark pink. Merten's bluebells are either red or blue, and in fact both shades occur on the same plant—the young flowers (buds) are red to light pink, the mature ones blue. Violets, lupines, and paintbrushes are also variable. However, a little practice will soon lead to a near-perfect identification record.

Many of the plants included in this book extend from Oregon to British Columbia and from the Olympics to the Rockies. It is not recommended for use over such a broad area but should serve you in travels through the Cascade Range from Mount Rainier to the Canadian border.

Of the more than 700 species of flowering plants in the Washington Cascades, only about a tenth are included here; however, this tenth accounts for over half the wildflowers one is likely to encounter. If you come upon a flower not shown in these pages you need not despair, for the descriptions mention many other species resembling those pictured.

Happy flower hunting! Remember—leave them exactly as you find them so others may enjoy their beauty too.

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FLOWERS OF THE FOREST

WESTERN CORALROOT (top left)

Corallorhiza mertensiana

Orchid Family

Flowers from late June to August

Flowers less than an inch across and typically orchid-like, mostly rose-purple but spotted with white and sometimes all white, with a spur below the lip, up to 30 in an erect raceme. Whole plant purplish, reddish, or white, leaves much reduced, without chlorophyll. Plant 5 to 20 inches tall. The roots are reduced and covered with mycorrhizal fungus and give the appearance of a cluster of beads or coral. Occurs mostly in the silver fir zone where there is little other undergrowth. Similar species include spotted coralroot (*C. maculata*) a shorter, stouter column, spur sometimes missing and lip usually with several purple spots; and striped coralroot (*C. stricta*) which has sepals and petals prominently 3-to-5 striped, lip not lobed, spur missing.

PINK PYROLA (top right)

Pyrola asarifolia

Heath Family

Flowers from June to September

Flowers pinkish to rose or purplish-red, $\frac{1}{8}$ to $\frac{1}{2}$ inch broad, cup-shaped and nodding. 5 to 20 flowers in an erect raceme of 6 to 16 inches tall. Leaves attached at base of stem, somewhat leathery, dark green and shiny on upper surface, somewhat purplish beneath, not mottled. Petioles at least as long as the round-to-oval leaf blades. Flowers mostly in July and August. Found in western hemlock or lower silver fir zones. One of eight *Pyrolas* in our area. One with a single white flower is called woodnymph (*P. uniflora*) (see p. 11); several others with pink flowers are distinguished on technical characteristics, among them being *P. picta* with mottled leaves and sidebells pyrola (*P. secunda*) with flowers on one side of the stem only.

BLEEDING HEART (bottom left)

Dicentra formosa

Bleeding-Heart Family

Flowers from March to July

Flowers pink to rose-purple, somewhat heart-shaped, about $\frac{3}{4}$ inch long, 3 to 10 in a terminal flower cluster held above the level of the herbage. One to 2 feet tall and succulent, leaves delicate and deeply dissected, stems 3-angled. Flowers from March in the lowland to July in the mountains. Occurs from valley bottoms of the western hemlock zone to slopes of the silver fir zone. Distinguished from *Corydalis* (p. 5) by its long spur and tall herbage and from steer's head (*D. uniflora*) which has one whitish flower and occurs on the drier mountain slopes (reportedly found near Chinook Pass).

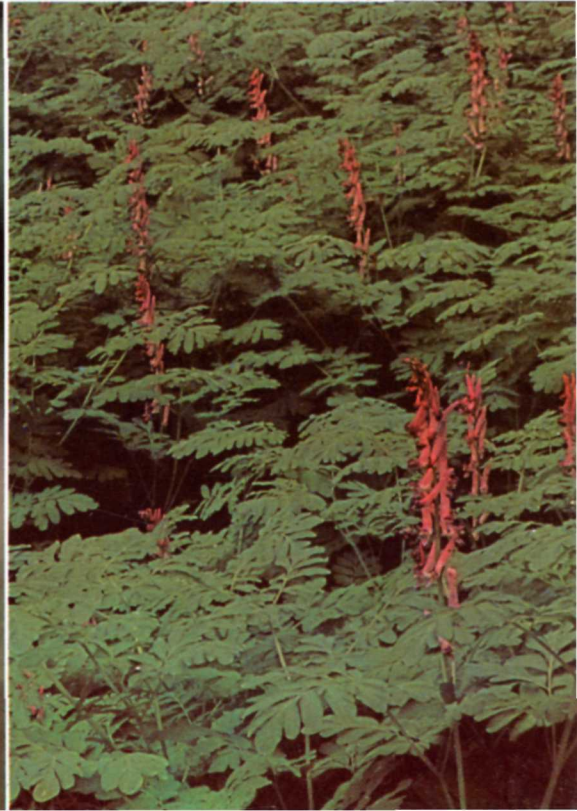
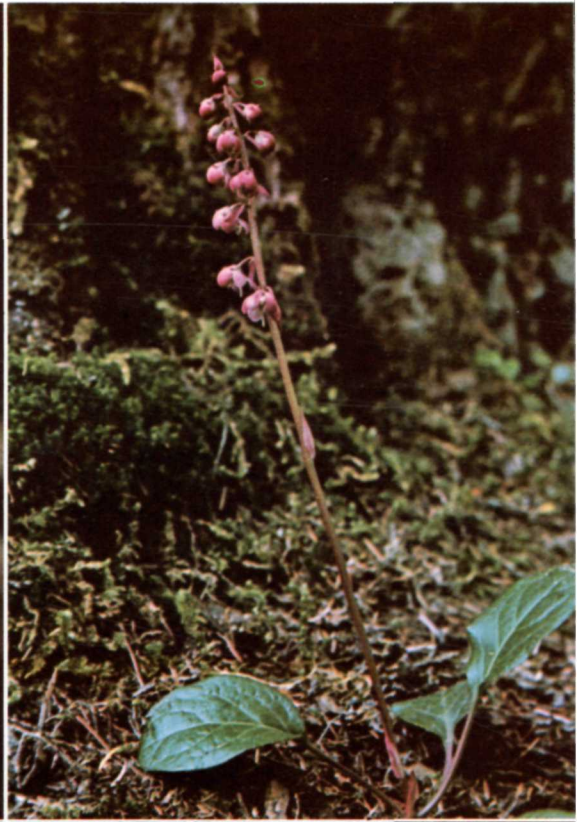
SCOULER CORYDALIS (bottom right)

Corydalis scouleri

Bleeding-Heart Family

Flowers from May to July

Flowers pink to rose, somewhat two-lipped and with a long spur, $\frac{3}{4}$ to $1\frac{1}{2}$ inches long in a 15- to 35-flowered raceme. Leaves large, succulent, and delicate, pinnately compound and again lobed or divided, stems hollow up to 4 feet tall. Found in moist places or along streams in the western hemlock zone. Common in the river bottoms of Mount Rainier, less common northward. A close relative, bleeding heart (p. 5), has a few heart-shaped flowers in a loose flower cluster, stands about a foot high.





CALYPSO

Calypto bulbosa

Orchid Family

Flowers from May to June

Flowers rose-purple to almost white, dainty, solitary, with a purple-veined or spotted slipper-like sac about 1 inch long. There is only one leaf attached at the base of the stem. It is broadly oval and has a petiole, 1½ to 3 inches long. Plant 3 to 5 inches tall from an edible bulb. Roots are much reduced and mycorrhizal like the coralroot (p. 4). Occurs in rich mossy woods in the western hemlock and silver fir zones. Cannot be confused with any other flower of the Pacific Northwest.



FOOL'S HUCKLEBERRY

Menziesia ferruginea

Heath Family

Flowers from May to July

Flowers yellowish-red to straw-orange, urn-shaped, about ¼ inch long, occurring in clusters from the end of the shoots of the previous year's growth and long stemmed. Leaves oval to elliptic, 1½ to 3 inches long, and clustered near the end of the branch. A rather tall shrub, 2 to 8 feet tall. Young branches have fine sticky hairs. The plant has the overall appearance of the huckleberries, which belong to the same family; the fruits are dry capsules, however, and not edible, hence the name "fool's huckleberry." Rather widespread, occurring from the coastal sitka spruce zone to the high subalpine zone east of the Cascades. In our area its best development occurs in the silver fir and mountain hemlock zones.

DEVIL'S CLUB*Oplopanax horridum*

Ginseng Family

Flowers from May to July

Flowers greenish-white, small, unattractive. Leaves large, up to 20 inches across, maple-like, with spines on the veins. A large deciduous shrub 3 to 10 feet tall with thick, somewhat pithy stems and long sharp spines. Berries red, attractive, borne in elongate clusters in July and August. Found in cool moist areas, especially along streams in the western hemlock and lower silver fir zones. A distinctive plant not confused with any other.

**SALMONBERRY***Rubus spectabilis*

Rose Family

Flowers from March to June

Flowers light red to rose-purple, 1 to 1½ inches broad, 1 to 4 flowers borne on a short leafy branch. Leaves pinnately compound into 3 to 5 leaflets which are oval and pointed at the apex and toothed on the margin. Fruit an aggregate of fleshy drupelets adhering together to form a raspberry-like fruit. Shrubby plant 3 to 15 feet tall reproducing from underground stems called rhizomes and hence occurring in patches. Younger branches covered with sharp spines, older ones with shedding bark. Fruit yellowish, maturing to orange-red in July. Found in lowland swamps and moist woods of western hemlock zone. A relative, the thimbleberry (*R. parviflorus*) has large maple-like leaves, is not spined, and has white flowers.





RED HUCKLEBERRY

Vaccinium parvifolium

Heath Family

Flowers from May to June

Flowers pale yellowish-pink, usually hidden by the foliage, urn-shaped. The bright red, edible berries are ripe in July. Leaves oval-shaped $\frac{1}{2}$ to $1\frac{1}{2}$ inches long. Stems green, not woody except at the base, prominently angled. Plant 2 to 8 feet tall, often growing atop an old stump or snag. Commonest in western hemlock zone but occurring from sealevel to 3500 feet. The other huckleberries have woody stems and bluish or black berries except *V. scoparium* which has small $\frac{1}{8}$ -inch diameter, red to maroon berries, is much smaller than *V. parvifolium*, and occurs at higher elevations on dry habitats.



PIPSISSEWA

Chimaphila umbellata

Heath Family

Flowers in July

Flowers pink, broadly saucer-shaped, with a small green "tea cup" in the center. The flowers nodding, about $\frac{1}{2}$ inch in diameter, 3 to 8 at the top of a single flowering stem, plant from 4 to 12 inches tall. The stem bears leathery, toothed leaves in whorls. Mainly found under dense older forests of western hemlock where the mossy soil surface is moderately dry and few other flowering plants grow. Occurs in western hemlock and silver fir zones from 2000 to 3500 feet. Several species of the heather family have flowers which resemble the pipsissewas, including the *Pyrolas*. None, however, have whorled leaves. The Menzies' pipsissewa differs mainly in its fewer leaves; these are lance-shaped but wider toward the top.

YELLOW VIOLET*Viola glabella*

Violet Family

Flowers from March to July

Flowers irregular, yellow, sometimes purplish-veined in the throat, about $\frac{1}{2}$ inch across, borne singly on long stems. Leaves either attached at the base of the stem with long petioles or borne on upper $\frac{1}{3}$ of stem, oval to broadly heart-shaped, smooth to slightly hairy, margins finely toothed. Plant 2 to 12 inches tall. The commonest yellow violet in the Cascades. Occurs in all three forested zones on the west side of the Cascades. Many species of yellow and purple-flowered violets occur in the Cascades; of these *V. semper-virens* has purplish-dotted and somewhat leathery leaves and flowers not confined to tips of branch; *V. canadensis* has flower-bearing stems shorter than leaves and the upper petals are bluish-red on the back.

**SKUNK CABBAGE***Lysichiton americanum*

Arum Family

Flowers from April to July

Flowers greenish-yellow, tightly clustered on a club-shaped stalk (spadix) which is enclosed by a conspicuous yellow leafy bract (spathe). Leaves all attached to the base of the stem, fleshy and large, up to $4\frac{1}{2}$ feet long. Flowering stalk and spathe about 8 inches long. Often attracting many insects by its odor. Its famous skunk-odor is not strong until the plant is dead and drying. Occurs in swamps and boggy areas mainly in the western hemlock zone. Could not be confused with any other Northwest plant.





**SINGLE-FLOWERED
INDIAN PIPE (below)**

Monotropa uniflora

Heath Family

Flowers from July to August

Flowers waxy-white, blackening with age, bell-shaped, $\frac{1}{2}$ to $\frac{3}{4}$ inch long, solitary and terminal at the end of a 2- to 10-inch white stem. Stems clustered, leaves lacking chlorophyll and reduced to scale-like. This is another saprophytic member of the heather family, deriving food from decaying matter in the soil rather than directly from sunlight. Occurs most commonly under the dense old-growth forests of the western hemlock zone. Easily distinguished by its single, terminal white flower. Pinesap (*Hypopitys monotropa*) has a dense cluster of straw-colored flowers.



PINESAP (above)

Hypopitys monotropa

Heath Family

Flowers from May to July

Flowers and stems pinkish to straw-colored, drying to black. Flowers bell-shaped, $\frac{3}{4}$ to $1\frac{1}{2}$ inches long in a tight, sometimes curled raceme, stems 2 to 10 inches tall. Leaves lacking chlorophyll, scale-like and reduced. Stems unbranched. This is a saprophyte, living off of dead forest litter and decaying wood. Found in both the western hemlock and silver fir zones from 2000 to 4000 feet. Closely related to the single-flowered Indian pipe, *Monotropa uniflora*, which has only one terminal whitish flower.

WOODNYMPH*Pyrola uniflora*

Heath Family

Flowers from June to July

Flowers white, somewhat saucer-shaped, with a small green "tea cup" (ovary) in the center. Solitary flowers nodding from the end of an erect stem, about $\frac{3}{4}$ inch broad. Leaves broadly oval and toothed, petiolate and clustered near the base of the stem. Stem 2 to 6 inches tall. Occurs mainly under older western hemlock forests where there is little other understory vegetation. Commonly grows on rotting wood in upper western hemlock zone or lower silver fir zone but ranges from sealevel to 3500 feet. Several other *Pyrolas* are found in our area; none have white solitary flowers.

**WHITE RHODODENDRON***Rhododendron albiflorum*

Heath Family

Flowers from July to August

Flowers creamy-white to greenish-white, 1 to $1\frac{1}{2}$ inches in diameter. One to 4 flowers in axillary clusters along the stems. Leaves deciduous, thin, deep green above, paler beneath, elliptic, $1\frac{1}{2}$ to 4 inches long. Twigs covered with short reddish hairs. Plant 3 to 6 feet tall. Found in cool, moist places, often along streams in upper silver fir, mountain hemlock, or subalpine meadow zones at edge of meadows or openings or in open woods. A related species, the pink rhododendron (*R. macrophyllum*) has evergreen leaves, large pink flowers in terminal clusters, and occurs in western hemlock zone but is not common in the Washington Cascades.





SALAL

Gaultheria shallon

Heath Family

Flowers from May to July

Flowers white to pinkish, urn-shaped, about $\frac{3}{8}$ inch long, 5 to 15 in a terminal or axillary raceme. Flower-bearing stems turn so that the flower cluster appears one-sided. Flowering stems and sepals covered with glandular hairs. Leaves coarse and leathery, oval-shaped, 2 to 4 inches long, the margin finely toothed. A small shrub up to 3 feet tall, often forming dense knee-high thickets. The insipid purple berries, ripe in August, are eaten by many animals. Found in the western hemlock zone, often under Douglas-fir on well-drained but moist sites. A couple other *Gaultheria* occur at higher elevations and have single flowers or smooth sepals: *G. ovatifolia* and *G. humifusa*.

TWINFLOWER

Linnaea borealis

Honeysuckle Family

Flowers from June to early August

Flowers pink to nearly white, bell-shaped with a long floral tube, fragrant and occurring in pairs at the end of the stem, $\frac{1}{2}$ to $\frac{3}{4}$ inch long, petals hairy on the inside. Ovary formed below the petals, as in all the honeysuckles, and glandular-hairy. Leaves borne in pairs, elliptic to oval, up to 1 inch long, somewhat toothed to smooth margins. A trailing vine which sometimes forms carpets, the flowers held 2 to 6 inches off the ground. Occurs in western hemlock and silver fir zones, from sealevel to 4000 feet; best development about 2800 feet.

VANILLA LEAF*Achlys triphylla*

Barberry Family

Flowers from April to July

Flowers creamy-white, small, tightly clustered in a dense spike up to 1½ inches long. Petals and sepals lacking. Leaves composed of 3 large, somewhat leathery leaflets on the end of a long petiole. Entire plant 8 to 16 inches tall. Herbage fragrant when dry with an odor reminiscent of vanilla. Reproduces vegetatively by underground stems called rhizomes, thus often forming dense pure colonies. Common in coniferous and deciduous woods, especially along streams in western hemlock and silver fir zones.

**FALSE SOLOMON'S SEAL***Smilacina racemosa*

Lily Family

Flowers from April to June

Flowers small, creamy-white in a tight flower cluster. Stamens longer than the petals. Leaves sessile to clasping, broadly oval, 3 to 8 inches long, 1½ to 3 inches broad. Berry red. Plants 12 to 40 inches tall. Sometimes flowers into July at higher elevations. Found in moist woods and along stream banks from sea-level to middle elevations in the mountains, mainly in the western hemlock zone. A similar species, *S. stellata*, has few flowers, a sparse raceme, and a stamens shorter than the petals.





TRILLIUM

Trillium ovatum

Lily Family

Flowers from March to July

Flowers white turning purple with age, petals and sepals, 3 each. Flower $1\frac{1}{2}$ to 4 inches across, attractive, solitary from between a whorl of 3 large green leaves. Entire plant 5 to 20 inches tall, from a short underground stem. Common, with a wide range. Found along stream banks to open or thick woods, often where boggy in spring, from western hemlock and silver fir zone, west to Engelmann spruce-subalpine fir zone east of Cascade Crest. Prized by the woodsman, but never picked, it heralds the coming of spring, flowering soon after the warm weather begins or after the snow melts in the mountains.



QUEEN'S CUP

Clintonia uniflora

Lily Family

Flowers from June to early July

Flowers white, solitary, somewhat bell-shaped, 1 to $1\frac{1}{2}$ inches broad. Flowers composed of 3 sepals and 3 petals, all white and appearing like petals. Leaves attached at the base of the flowering stem 2 or 3, parallel veined, and 3 to 8 inches long. Plants up to 6 inches tall, often forming rather pure colonies. The attractive but inedible metallic-blue berries develop in July and August. Occurs in the upper western hemlock and silver fir zones from 2000 to 5000 feet, usually where rather moist but not wet.

BUNCHBERRY DOGWOOD*Cornus canadensis*

Dogwood Family

Flowers from June to August

Flowers small, greenish-white, clustered together in a condensed cyme and surrounded by 4 white, conspicuous, petaloid bracts. The inflorescence, including the bracts, $\frac{3}{4}$ to $1\frac{1}{4}$ inches across. Leaves 1 to 3 inches long, elliptic to oval, 4 to 7 in a whorl just below the inflorescence, dark green above, pale green below. Its parallel-appearing (actually arcuate) venation is typical of all dogwoods. Plants connected underground by rhizomes and thus developing in colonies. Most common in the silver fir zone. Flowers mainly from June to August but sometimes again in October and November. Clusters of attractive but inedible orange-red berries develop in August and September. A close relative is the Pacific dogwood (*Cornus nuttallii*), a small tree of the western hemlock zone.

**CREeping RASPBERRY***Rubus lasiococcus*

Rose Family

Flowers from June to August

Flowers composed of 5 white petals surrounding numerous stamens and pistils, the sepals fused to form a disc-like base. Flowers about $\frac{1}{2}$ inch broad, 1 or 2 to a stem. Leaves usually 3 from the rooting nodes, long-petioled and 3-lobed, margin doubly toothed. Stems trailing, unarmed and finely hairy, up to 6 feet long. Flowering plant only 4 inches high. Fruits composed of a few juicy, red drupelets. Found on moderately dry soil in thickets or sparse-to-dense woods from 1500 to 5500 feet, mostly in silver fir and mountain hemlock zones. Distinguished from trailing rubus (*R. pedatus*) which has compound leaves of 5 leaflets and from *R. nivalis* which is armed with recurved spines.





MERTEN'S BLUEBELLS

Mertensia paniculata

Borage Family

Flowers from May to August

Flowers light pink changing to blue, bell-shaped to funnel-shaped, about $\frac{3}{8}$ inch long, nodding, numerous in a branched and open flower cluster. Leaves from the base of the stem, heart-shaped and with petioles, those on the stem lance-shaped to oval 1 to 6 inches long. All leaves thin and prominently veined. Plants clustered 8 to 40 inches tall. Found along stream banks, in wet meadows, in damp thickets or at the base of wet cliffs. Most common in the silver fir and mountain hemlock zones, also in the Englemann spruce-subalpine fir zone on the east side of the Cascades.



WILD GINGER

Asarum caudatum

Birthwort Family

Flowers from April to July

Flowers purplish-brown to greenish, sepals conspicuous with long "tails." Flowers borne close to the ground from between 2 broadly heart-shaped leaves. Leaves 2 per node, dark green above, paler beneath, up to 4 inches long. A low-growing, somewhat trailing plant, forming large mats, usually not more than 4 inches high. The flowers are hidden by the leaves. Common in the western hemlock and silver fir zones in moist shaded woods with rich leaf litter. The thick underground stems called rhizomes have a faint odor of ginger. Should not be confused with any other species in our area.

JACOB'S LADDER*Polemonium pulcherrimum*

Phlox Family

Flowers from June to August

Flowers blue, sometimes with a yellow "eye," more or less bell-shaped, $\frac{1}{4}$ to $\frac{1}{2}$ inch long in a congested flower cluster. Leaves attached at the base of the main stem, well-developed, pinnately compound with 11 to 25 leaflets, stem leaves smaller. Plant 2 to 20 inches tall. Perennial, with a cluster of stems from an underground storage root. Herbage more or less glandular. Occurs in moist shaded places in the mountain hemlock, Engelmann spruce-subalpine fir, or subalpine meadow zones. Distinguished from the skunk-leaf *Polemonium* which has densely glandular herbage with a faint skunk odor and occurs mainly in rock crevices in the alpine zone.

**ROSY TWISTED STALK***Streptopus roseus*

Lily Family

Flowers from June to July

Flowers rose-lavender to greenish, usually with white tips, bell-shaped, up to $\frac{1}{2}$ inch long on long slender stems from the axils of linear-oval leaves. Leaves 2 to 4 inches long. Plant 6 to 16 inches tall. Found at middle elevations (2500 to 4000 feet) along streams and in damp woods. Western hemlock and silver fir zones on west side, Engelmann spruce-subalpine fir zone on the east side. Several other wild lilies have a similar appearance: *S. streptopoides* has flattened rather saucer-shaped flowers; the white-flowered twisted stalk (*S. amplexifolius*) has branched stems with greenish saucer-shaped flowers, is 2 to 3 feet tall, occurs at lower elevations than *S. roseus*, and has a bend in the flower bearing stem; Fairy bells (*Disporum* spp.) has no bend or twist in pedicels, has branching stems and creamy-white to greenish-yellow flowers.





FLOWERS OF THE MEADOWS

COLUMBINE

Aquilegia formosa

Buttercup Family

Flowers from July to August

Flowers red and yellow, colorful and conspicuous, 1 to 2 inches across, solitary and nodding. Hummingbird pollinated. Leaves mostly attached at the base of the stem, smaller ones attached on the stem. Leaves divided into 3 thin leaflets, which are again lobed. Herbage smooth. Plant 1 to 3 feet tall. Occurs in moist to moderately dry subalpine meadows or in openings in mountain hemlock zone or along streams. A related species, the yellow-flowered columbine (*A. flavescens*), occurs in the alpine zone in the North Cascades.

MAGENTA PAINTBRUSH

Castilleja parviflora var. *oreopola*

Figwort Family

Flowers from late June to September

Flowers deep rose-pink, not orange, bracts that enclose the flower colorful and conspicuous, petals fused together forming a 2-lipped flower. Flowers held in compact-to-loose, erect spikes. Leaves alternate, at least the lower ones divided into 3 lobes. Plant 6 to 14 inches tall. Grows in all but the driest habitats (where *C. miniata* is found) or the wettest (where the white-flowered *C. cryptantha* may be found) in the subalpine meadow zone, 5000 to 6300 feet. Two common reddish-flowered paintbrushes occur in our area: *C. miniata* has leaves not lobed or dissected and flowers orangish, although variable; *C. rupicola* has leaves dissected into 7 to 9 lobes, deep orangish-red flowers, 3-6 inches tall, and lives in high rocky places. (See also white paintbrush, p. 27.)

ROSY SPIREA*Spirea densiflora*

Rose Family

Flowers from late June to August

Flowers pink to rose, small, in a dense, nearly flat-topped cluster, 1 to 1½ inches broad. Leaves oval to elliptic and finely toothed for at least half the leaf margin, paler and strongly veined on lower surface. Plants 20 to 40 inches tall, bark reddish or purplish-brown. Found along streams and lakes or on wooded-to-open rocky slopes in the mountain hemlock and subalpine meadow zones. Three other species occur in our area: *S. betulifolia* is white-flowered; *S. pyramidata* (glabrous leaves) and *S. douglasii* (white tomentose leaves) have elongated, rosy-pink flower clusters.

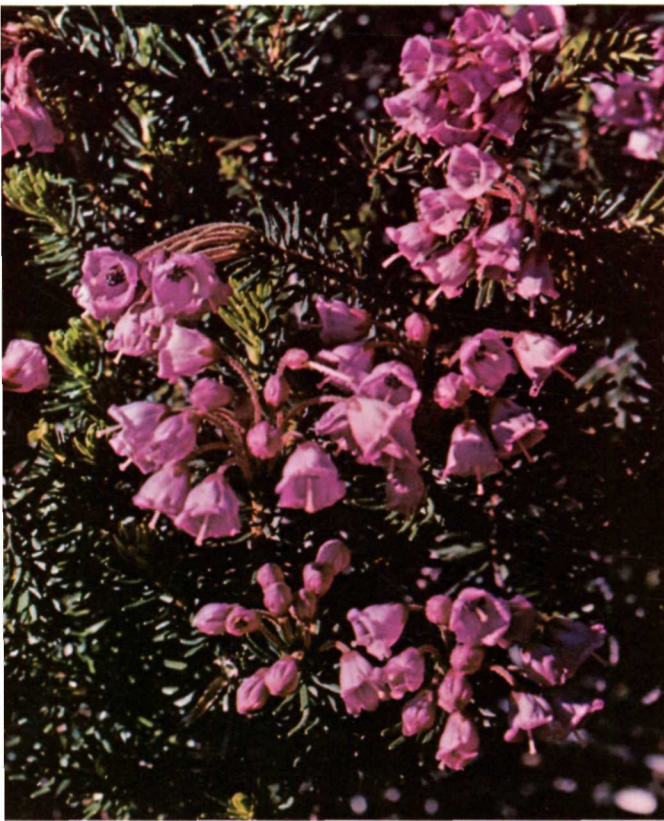
**INDIAN THISTLE***Cirsium edule*

Sunflower Family

Flowers from July to September

Flowering heads globose, composed of tubular disc flowers only, bright pink to purple, 1 to 2 inches across, often attracting bumblebees. Stems 3 to 6 feet tall, succulent, somewhat hairy, bearing alternate lobed and prickly leaves. Found in moist meadows from 4000 to 5500 feet, sometimes lower and sometimes higher on sandy ridge tops. Several other species of thistle, somewhat coarse and not succulent, occur in the Puget Sound area at low elevations.





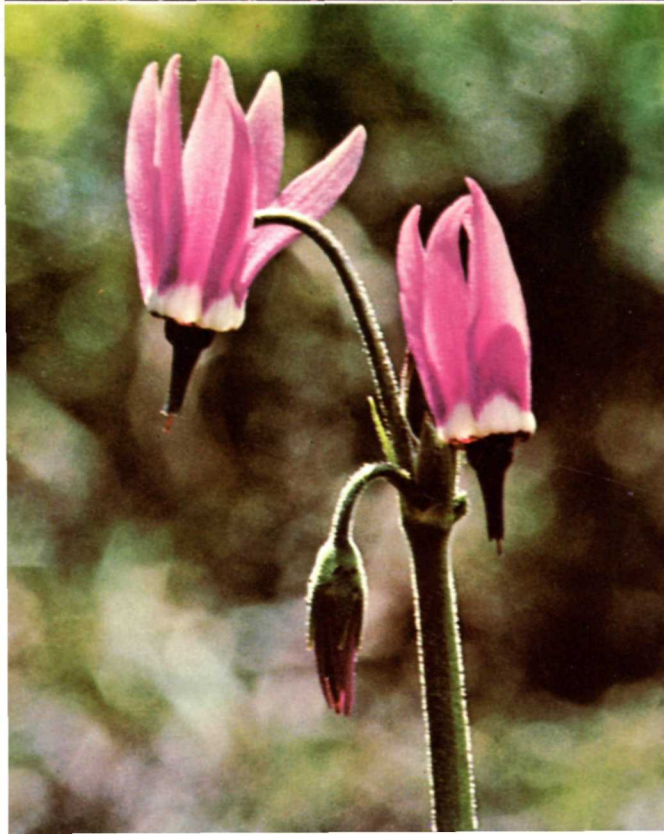
RED HEATHER

Phyllodoce empetriformis

Heath Family

Flowers from June to August

Flowers rose to pink, bell-shaped, $\frac{1}{4}$ inch broad, borne singly from leaf axils but clustered near the tip of the stem. Leaves alternate, linear, evergreen, about $\frac{1}{2}$ inch long, alternately arranged and deeply grooved and somewhat rolled inward. Plant 4 to 16 inches tall. Found in cool moist subalpine meadows, 5000 to 6000 feet elevation. The fruits develop in August or September and are eaten by several upland birds. A similar species, yellow heather (*P. glanduliflora*), has yellow, urn-shaped flowers and occurs at higher elevations. White heather (see p. 32) has white flowers and distinctively different herbage.



JEFFREY SHOOTINGSTAR

Dodecatheon jeffreyi

Primrose Family

Flowers from June to August

Flowers reddish to lavender or rose-pink, $\frac{1}{2}$ to $1\frac{1}{4}$ inches long, 3 to 15 in a terminal cyme. Petals abruptly turned backward exposing the fused stamens and the stigma, hence the common name "Shooting Star." Leaves oval to broadly lance-shaped with the widest point nearer the tip, 2 to 6 inches long, stems and leaves in dense clumps, 4 to 20 inches tall. Found on wet ground and along slow-moving streams in the subalpine meadow zone. A distinctive plant in our area; several other shootingstars occur elsewhere.

LEWIS MONKEYFLOWER*Mimulus lewisii*

Figwort Family

Flowers from June to August

Flowers rose-red to pinkish-purple, marked with yellow, 2-lipped with 5 lobes, 2 upper and 3 lower, from the leaf axils or terminal. Leaves without a petiole, strongly veined from the base, oval to elliptic, 1 to 4 inches long, the margin often toothed. Grows in many-stemmed clusters arising from stout, branching underground stems called rhizomes. Herbage sticky-hairy. Plant 12 to 40 inches tall. Found along streams and other wet places in the subalpine meadow zone. Several other species of yellow or pink monkeyflowers occur in the Cascades.

**BIRDSBEAK PEDICULARIS***Pedicularis ornithorhyncha*

Figwort Family

Flowers from July to August

Flowers dark rose-purple, clustered near the tip of the flowering stem in a tight raceme. The beak is straight (distinguishing it from most other species of *Pedicularis*). The flower is $\frac{1}{2}$ to $\frac{3}{4}$ inch long and resembles the head of a duck or goose. Leaves are all attached at the base of the stem, are reddish-green and pinnately compound with the lobes again toothed or dissected. Up to 12 inches tall. Grows in cool moist subalpine meadows, often with heather. Found from Mount Rainier northward. Several other species of *Pedicularis* may be encountered: Coiled-beak pedicularis (*P. contorta*) (dissected leaves) and ramshorn pedicularis (*P. racemosa*) (seriate but not dissected leaves) have creamy-white flowers; bracted pedicularis (*P. bracteosa*) (tall with few basal leaves) and Rainier pedicularis (*P. rainierensis*) (with a beak and mostly basal leaves) have yellow flowers; Elephanthead (*P. groenlandica*) (see p. 22) has pink flowers.





ELEPHANTHEAD

Pedicularis groenlandica

Figwort Family

Flowers from late July to August

Flowers purplish-pink, shaped like an elephant's head complete with trunk, ears, and forehead. Flowers borne in a raceme. Leaves mostly attached at the base of the stem, pinnate and incised, 2 to 10 inches long. Plant 6 to 12 inches tall. Found in the subalpine meadow zone along cold, slow-moving streams or in moist meadows. The most distinctive of the pedicularis species but one of the least common. (See discussion of birdsbeak pedicularis on page 21.)



SPREADING PHLOX

Phlox diffusa

Phlox Family

Flowers from June to August

Flowers white to pink, with a long trumpet-shaped tube with 5 lobes at the opening, $\frac{3}{8}$ inch long, solitary at the ends of the branches. Leaves linear, pointed, $\frac{1}{4}$ to $\frac{3}{4}$ inch long and occurring in pairs. Perennial from a deep taproot, forming a low-growing, dense mat, up to 4 inches high. Flowers shortly after the snow leaves the ground in the spring (usually June) and continuing into August. Found on dry, open rocky slopes mainly in the subalpine and alpine zones. Also found in the sagebrush deserts east of the Cascades.

FIREWEED*Epilobium angustifolium*

Evening Primrose Family

Flowers from June to September

Flowers rose to purple or rarely white, $\frac{1}{2}$ to $\frac{3}{4}$ inch long, 15 to 50 in an erect raceme with 4 petals. Leaves alternate on the stem and are narrowly lance-shaped, 4 to 6 inches long. Plant 2 to 8 feet tall. Perennial from wide-spread underground stems called rhizomes. Found from the coast to well up in the mountains especially along roads and in burns, hence its name. The silky-winged fruits are common in the fall. Several other fireweeds occur in our area; none should be confused with this one, however, since they are all much smaller.

**DWARF FIREWEED***Epilobium latifolium*

Evening Primrose Family

Flowers mainly in August

Flowers rose to deep purplish-pink, $1\frac{1}{2}$ inches in diameter, 3 to 12 in a raceme. The 4 petals are delicately dark-veined. Leaves are broadly lance-shaped, borne in pairs below and singly above, up to 2 inches long, entire to finely toothed. Plant 6 to 16 inches tall. Flowers from late July to early September. Grows in high moist subalpine meadows. Several other short fireweeds occur in our area but are distinguished only on technical characteristics and are not common.



Flowers of the Meadows, Orange to Yellow



BUTTERCUP

Ranunculus eschscholtzii

Buttercup Family

Flowers from June to July

Flowers shiny yellow, cup-shaped, solitary, $\frac{1}{2}$ to 1 inch across. Petals free from each other enclosing a whorled cluster of many stamens. Leaves mostly from the base of the stem, lobed or dissected, 1 to 2 inches long. Two to 8 inches tall. Flowers from late June through July or even August in late years, near the edge of a receding snowbank. Found in the subalpine meadow zone from 4500 to 6000 feet. Several less common buttercups may be encountered which are distinguished by technical characteristics. The cinquefoil (*Potentilla flabellifolia*), a member of the rose family, may be confused with the buttercups, except that its petals are fused to a cup which supports the rest of the flower; it is also larger, up to 15 inches tall, and has stipules at the base of the petioles.



COLUMBIA TIGERLILY

Lilium columbianum

Lily Family

Flowers from June to July

Flowers yellow-orange to red-orange, about $1\frac{1}{2}$ inches across, conspicuous, dark-spotted, sepals and petals strongly recurved, making the flower resemble a Turk's cap and exposing the stamens and pistil. Several flowers in a loose raceme. Leaves lance-shaped, usually whorled but sometimes scattered on the stem, 1 to 4 inches long, somewhat succulent. Plants 1 to 4 feet tall, smooth, growing from ovoid scaly bulbs. Found in open woods and meadows up to 5500 feet.

YELLOW MONKEYFLOWER

Mimulus tilingii

Figwort Family

Flowers from July to September

Flowers yellow, sometimes red-spotted in the throat, usually solitary and showy. Leaves without petioles, rhombic to oval, small, about 1 inch long. Plants 2 to 8 inches tall, perennial and clumped from well-developed, often sod-forming underground stems called rhizomes. Found along streams and other wet places in the upper subalpine meadow zone. Distinguished from the Lewis monkeyflower (*M. lewisii*) by its pink flower and from the yellow-flowered common monkeyflower (*M. guttatus*), which occurs at lower elevations, has 5 or more flowers, and is taller.



STONECROP

Sedum divergens

Stonecrop Family

Flowers from July to September

Flowers yellow, 1/2 to 3/4 inch across, 3 to 15 in a loose terminal inflorescence. The fleshy, oval leaves, up to 1/2 inch long, occur in pairs. The whole plant usually is only 3 to 6 inches tall. The name of the species is derived from the way the fruits (follicles) spread apart (diverge) at maturity. Found in dry places mostly subalpine and alpine (5000 to 7000 feet elevation), but may be found at lower elevations (3000 feet) on rocky outcrops.



SENECIO

Senecio integerrimus

Sunflower Family

Flowers from June to July

Flower heads of both disc and ray flowers, both yellow. Heads 1 to 2 inches across, several in an umbellate flower cluster. Commonly crawling with insect pollinators. Basal leaves 3 to 8 inches long, 1/2 to 3 inches wide. Stem leaves smaller, becoming reduced toward the flower cluster. Solitary stems 6 to 28 inches tall. Young herbage stiff-hairy becoming smooth with age. Found on high, moderately dry alpine ridges, 5000-7000 feet, sometimes on sunny, fairly dry spots at lower elevations. Distinguished from similar species by its sparser and fewer ray flowers, umbellate flower cluster, and alternate somewhat coarse herbage.





GLACIER LILY

Erythronium grandiflorum

Lily Family

Flowers from June to July

Flowers yellow, with anthers pale to white in our area, nodding, 1 to 3 per plant. Leaves 2 or 3 from the base of the stem, oval, 4 to 8 inches long. The flowering stem 6 to 12 inches tall. Flowers in the subalpine meadow zone just as the snow melts or sometimes before it is completely gone. This species also occurs in the sagebrush desert east of the Cascades where it blooms in March. Easily distinguished from its relative, the avalanche lily, which is white-flowered (see p. 27).



GOLDEN FLEABANE

Erigeron aureus

Sunflower Family

Flowers from late July to August

Flower heads golden-yellow, up to an inch across, solitary and usually not over 5 inches high. Both disc and ray flowers present. Leaves mostly attached at the base of the stem, 2-4 inches long, up to an inch across, widest point nearer the tip, finely hairy. This is a typical plant of high, moderately dry alpine ridges, 6500 to 7500 feet elevation on Mount Rainier, and slightly lower to the north. Often found with Lyall's lupine (*Lupinus lepidus*), alpine paintbrush (*Castilleja rupicola*), and yellow heather (*Phyllodoce glanduliflora*).

AVALANCHE LILY*Erythronium montanum*

Lily Family

Flowers from late June to July

Flowers white with a yellow throat, becoming pinkish with age, 2 to 4 inches broad, 1 to 5 flowers at the end of an 8- to 10-inch stem. Leaves 2 or 3 from the base of the stem, oval, 4 to 8 inches long. Usually the plants turn brown and die and shed their seeds in August. Found in moist subalpine meadows early in the season, before most other plants flower. Fields of this flower are sometimes conspicuous soon after the snow melts, the area being dominated by other lush herbs such as valerian, lupine, and bistort later in the season. The yellow-flowered glacier lily is described on p. 26.

**WHITE PAINTBRUSH***Castilleja parviflora* var. *albida*

Figwort Family

Flowers from July to August

Flowers white or light pinkish with sharp-pointed calyx lobes (variety *oreopola* has blunt calyx lobes). Leaves divided into 3 to 5 lobes, smooth to sparsely silky-hairy. Perennial, blackening with age, erect, 6-12 inches tall, from a woody base. Occurs in moist subalpine meadows in the North Cascades. Not known on Mount Rainier. Closely related to the magenta paintbrush described on p. 18.





WESTERN ANEMONE

Anemone occidentalis

Buttercup Family

Flowers from June to July

Flowers creamy-white with 6 petal-like sepals surrounding a dense cluster of the pollen-bearing stamens, large, up to 2 inches in diameter, conspicuous and solitary on the end of a short, thick, usually densely woolly stem, the stem elongating as the season progresses until it is tall and thin when the conspicuous plumose fruits are ripe. Leaves mostly from the base of the stem, long-petioled and finely dissected. Plant 4 to 6 inches tall when in flower, up to 20 inches in fruit. Fruit-heads conspicuous in July and August; the silky plumed seeds begin to shed during the first heavy rain in early September or late August. Found on moderately dry subalpine slopes between 5000 and 6500 feet, usually flowering at the edge of a melting snow bank. A couple of similar alpine species occur in our area but are not common.



CASCADE MOUNTAIN-ASH*Sorbus scopulina*

Rose Family

Flowers from May to early July

Flowers small, white, densely clustered in large flat-topped bunches. Leaves pinnately compound into 9-13 blunt-tipped leaflets. A shrub up to 8 feet tall. Bright coral-red berries are conspicuous in fall and eaten by many animals, although not edible for man. Most common at the edge of meadows or thickets above 3500 feet in the mountain hemlock and subalpine meadow zones. A similar species, *S. sitchensis*, is also common in similar habitats but is covered with small, copper-red colored hairs and has sharp-pointed leaflets.

**MARSH MARIGOLD***Caltha biflora*

Buttercup Family

Flowers from May to August

Flowers white to cream, 1 to 2 inches across, similar to the anemone or buttercup which belong to the same family. One or 2 terminal flowers per plant. Leaves mostly from the base of the stem, round, broader than long, up to 4 inches long, toothed. Flowers held 3 to 12 inches from the ground. Found in wet subalpine habitats, usually along cold rivulets which are free of snow early in the season, 4000 to 5500 feet elevation. A closely related species, *C. leptosepala*, has leaves longer than broad and is more common in some places than *C. biflora*. The distantly related and rare *Trollius laxus* is found in the same habitats as *Caltha* on Mount Rainier. It flowers very early, however, and has deeply lobed leaves.





MOUNTAIN BISTORT

Polygonum bistortoides

Buckwheat Family

Flowers from July
to early September

Flowers small, white, turning pinkish with age but persisting into fall. Inflorescence a dense spike-like raceme only slightly larger than the bumblebee sometimes found clinging to it in late summer. Leaves mostly attached at the base of the stem, linear-oblong, from 4 to 8 inches long with a few reduced ones on the flowering stem. Flowering stem 12 to 24 inches tall, conspicuous in the subalpine meadows from 5300 to 6600 feet on Mount Rainier, less common and slightly lower to the north. Might be confused with valerian (p. 30), with which it is sometimes growing; valerian has opposite, pinnately lobed, succulent leaves and completely different, although white, flowers.



PARTRIDGEFOOT

Luetkea pectinata

Rose Family

Flowers from June to August

Flowers white, $\frac{1}{4}$ inch in diameter, clustered at the end of the stem. Leaves mostly at the base of the stem, finely divided. Mostly 4 to 7 inches tall, semi-shrubby, forming dense mats at high elevations, 5500-7000 feet, in the subalpine and alpine zones. Sometimes associated with red or yellow heather, more commonly forming a rather pure stand. Commonest on raw, sandy or gravelly, moist alpine soils where snow patches remain until late in the season.

BOG ORCHID*Habenaria dilatata*

Orchid Family

Flowers from June to September

Flowers white to slightly greenish, irregular, orchid-like, about $\frac{1}{2}$ inch across in a spicate raceme. Lower leaves oblong, 2 to 4 inches long, upper leaves sheathing, lance-shaped, $\frac{1}{2}$ to 1 inch long. Plant usually 6 to 10 inches but up to 3 feet tall. Found in wet boggy ground in open-to-shaded ground mainly in western hemlock and silver fir zones. Similar species include *H. saccata* with green flowers, saccate spur shorter than the lip, spike sparsely flowered, growing in bogs in silver fir and mountain hemlock zones and *H. hyperborea* with green flowers, spur shorter than the lip, and densely flowered spike.

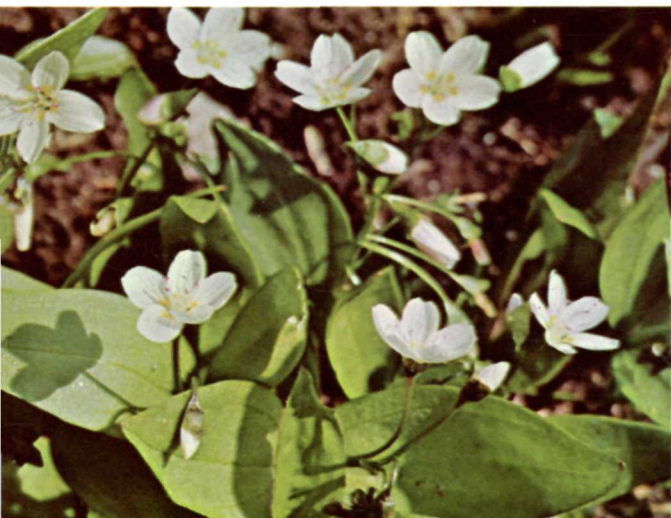
**MEADOW PARSLEY***Ligusticum grayi*

Parsley Family

Flowers from July to September

Flowers white, small, in a compound umbel. Leaves mostly from near the base of the stem, sometimes 1 or 2 reduced leaves on stem. Leaves finely divided, petioles sheathing the stem. Herbage smooth, plants 8 to 28 inches tall. Found in moist to dry, tall herbaceous meadows in the subalpine meadow zone. Many similar species occur mainly at lower elevations or with different flower color. In the subalpine meadows, valerian and mountain bistort have white flowers and from a distance might be confused with this plant, but the flowers and herbage are distinctively different.





SPRING BEAUTY

Claytonia lanceolata

Purslane Family

Flowers from June to early July

Flowers pink to white with pink lines, $\frac{1}{4}$ to $\frac{3}{4}$ inch wide, 2 to 10 in a cluster. Two leaves from about halfway up the stem, 1 to $2\frac{1}{2}$ inches long plus 1 or 2 from the base. Perennial from a tuberous edible bulb which tastes somewhat like potato when cooked. Found on dry grassy slopes in the subalpine zone before most other species even start growing. Often found near the edge of a retreating snow bank where ample water is available.



WHITE HEATHER

Cassiope mertensiana

Heath Family

Flowers from July to August

Flowers white, bell-shaped to urn-shaped, $\frac{1}{4}$ inch long, with several from the leaf axils near the tips of the stems. Leaves small, scale-like, opposite and 4-ranked sessile and appressed to the stem, grooved only at the base. Plant 5 to 15 inches tall. Found in subalpine meadows, 5500 to 6500 feet, on open but cool and moist slopes. Often grows with red heather, Cascades huckleberry, and subalpine lupine. The fleshy berry-like fruits are eaten by several animals in August and September. Moss heather (*C. stelleriana*) bears flowers singly and terminally, leaves alternate, not common.



TOLMIE SAXIFRAGE

Saxifraga tolmiei

Rose Family

Flowers from July to August

Flowers white, $\frac{1}{4}$ to $\frac{1}{2}$ inch across, 1-4 in a loose flower cluster. Leaves fleshy (similar to stonecrop's), alternate on lower portion of stem to opposite above, up to $\frac{1}{2}$ inch long, smooth-margined except for a few silky hairs at base. Usually found at high elevations (6000-7000 feet) although it has been found down to 3000 feet on gravelly soil. A low, mat-forming plant usually about 3 to 4 inches tall, a pioneer on moist bare pumice or talus slopes where little else grows. At the upper limit of its range is usually found only in protected rock crevices. Might be confused with stonecrop, which has yellow flowers.

CASCADES HUCKLEBERRY*Vaccinium deliciosum*

Heather Family

Flowers in July

Flowers pinkish, round, somewhat urn-shaped, $\frac{1}{4}$ inch in diameter, solitary on short stems. Leaves 1-1½ inches long, finely toothed, dull green to blue-green turning to red-brown in fall. A small shrub from 3 inches to over a foot tall. The tasty bluish-to-dark-purple berries are ripe in September. Found on moderately dry, gentle slopes in the subalpine zone, often with the heathers. Similar species include thin-leaved huckleberry (*V. membranaceum*) which is taller (2-4 feet), has larger berries, and grows at lower elevations. Other species of blue-to-purple huckleberries also occur at lower elevations. The back-cover photograph shows this plant in fruit.

**SITKA VALERIAN***Valeriana sitchensis*

Valerian Family

Flowers from July to August

Flowers white, about $\frac{1}{2}$ inch long, petals fused to form a slightly irregular flower with a bulge on one side. Many flowers in a compact, somewhat round-topped flower cluster, becoming open and expanded in fruit. Leaves mostly borne on the stem, few if any from the base, usually 2 to 5 pairs each divided into 3 to 7 leaflets with toothed margins. Plant 1 to 3 feet tall, somewhat purplish when young. Common in moist herbaceous subalpine meadows from 5000 to 6000 feet.

**COLTSFOOT***Petasites frigidus*

Sunflower Family

Flowers from April to July

Flowers whitish to light purple or pink condensed into compact heads $\frac{1}{2}$ to $\frac{3}{4}$ inch across. Ray flowers lacking. Heads clustered near the top of the flowering stem. Leaves mostly attached at the base of the stem, long-petioled, triangular to heart-shaped, deeply incised or lobed and up to 14 inches across. Leaves developing after the flowers, stem-leaves reduced to bracts, flowering stems stout, up to 3 feet tall. Occurs in all zones west of the Cascade Crest in meadows, along streams or roadways where it is cool and moist.





COW PARSNIP

Heracleum lanatum

Parsley Family

Flowers from June to August

Flowers white in a large terminal, flat-topped compound umbel. Leaves compound into 3 leaflets which are large and palmately lobed and serrate, petioles expanded and sheathing the stem. A robust, single-stemmed perennial from a stout taproot, 3 to 8 feet tall, the umbellate flower cluster 4 to 8 inches broad. Herbage usually somewhat hairy. Found from the lowlands to moderate elevations in the mountains, along stream banks and on moist ground. Western hemlock and silver fir zones. Distinguished from all similar species by its size.



GREEN HELLEBORE

Veratrum viride

Lily Family

Flowers from late June to

September

Flowers yellowish-green, inconspicuous, $\frac{1}{2}$ inch across, in a loose upright panicle, lower flowering branches drooping. Largest leaves attached near the base, others reduced upward, oblong, 6 to 12 inches long, strongly veined. Plant 3 to 6 feet tall. Found from 3000 to 6000 feet, mainly in the subalpine meadow zone, especially where cool and moist or even swampy, but sometimes on rather dry slopes, although not flowering there. A similar species, white hellebore (*V. californicum*), has whitish to slightly yellow-green flowers, flowering branches crowded and not drooping, found at lower elevations and generally east of the Cascades.

MOUNTAIN DAISY*Erigeron peregrinus*

Sunflower Family

Flowers from July to August

Flowers of two types, disc flowers tubular and yellow, ray flowers lavender and strap-shaped; together they form a compact flower cluster called a "head." (Heads appear to mimic other kinds of simple flowers.) Heads 1 to 3 inches in diameter, solitary or only a few on the flowering stem. Basal leaves petiolate up to 8 inches long, stem leaves getting smaller above. Plant up to 25 inches tall. This is a fibrous-rooted perennial fairly common in lush herbaceous meadows in the subalpine zone. *Erigeron* can be distinguished from asters which have fewer ray flowers per head and a deep involucre. (An involucre is a cup-shaped cluster of green bracts where the head is attached to the stem. The presence of an involucre is a key to the recognition of this important family.)

**ALPINE ASTER***Aster alpinus*

Sunflower Family

Flowers from July to August

Flower heads of both disc and ray flowers. The inner disc flowers yellowish, outer ray flowers violet to purple. Heads 1 to 1½ inches across, solitary on stems 2 to 6 inches tall. Leaves attached at the base of the stem, fleshy, usually 3- (sometimes 5-) veined, 1 to 10 inches long, up to ½ inch wide. Occurs on rocky or sandy high-elevation slopes and ridges, usually with little competition, commonest between 5500 and 7000 feet. Sometimes found in moist sedge meadows at lower subalpine elevations. The only aster in our area with all basal leaves and solitary flower heads.



Flowers of the Meadows, Purple to Blue



PLEATED GENTIAN (top left)*Gentiana calycosa*

Primrose Family

Flowers from August to September

Flowers deep blue, sometimes streaked with green or yellow, tubular to bell-shaped, 1½ inches long, 1 to 3 from the tip of the stem. Leaves opposite, succulent, usually 7 to 9 pairs on a stem, semi-heart-shaped, smooth, about 1 inch long. Entire plant 6-10 inches tall. One of the last subalpine plants to flower, ordinarily about the same time the Cascades huckleberry is ripe. Occurs in clumps in moist subalpine meadows at 5000-6500 feet. In the absence of flowers it might be confused with veronica which is smaller and has 4 blue-to-white spreading petals but with succulent, opposite leaves.

MARSH VIOLET (top right)*Viola palustris*

Violet Family

Flowers from May to July

Flowers deep lilac to white with purple lines, irregular, ¼ to ½ inch long, solitary at the end of an erect stem. Leaves heart-shaped with blunt-toothed margins. Flowers and leaves both arising from underground stems called rhizomes. Found in moist meadows and along streams at most elevations in the mountains but commonest from 3500 to 5000 feet. Many species of white, purple, or yellow-flowered violets occur in our area; this is the most common of the lavender-flowered ones.

SUBALPINE LUPINE (bottom left)*Lupinus latifolius* var. *subalpinus*

Pea Family

Flowers from July to August

Flowers pale blue to blue or lavender or sometimes completely white. Irregular flowers typical of the Pea family. Flowers 25 or more in a raceme 5 to 12 inches tall. Leaves alternate, divided into 5 to 9 leaflets which all attach at the same point on the petiole, from densely hairy to nearly smooth. Plant up to 26 inches tall, often succulent, especially when growing in shade. The seeds, shed in late August and September, supply food for several animals including the ground squirrel. Deep-rooted and common in moist soil in the subalpine meadow zone from 4700 to 6500 feet. Easily distinguished from Lyall's lupine which occurs above 6500 feet and is smaller and densely silky-hairy or even woolly.

HAREBELL (bottom right)*Campanula rotundifolia*

Campanula Family

Flowers from June to September

Flowers light blue, bell-shaped, ½ to 1 inch long, solitary or a few in a loose terminal raceme where the terminal flower blooms first. Leaves of two types, those at the base of the stem with long petioles and heart-shaped to round blades and stem leaves alternate and linear, ¾ to 3 inches long. Plant 4 to 30 inches tall. Flowers from June to July at low elevations and from August to September at higher elevations. Occurs in a wide variety of habitats in western hemlock zone and in subalpine meadow zone. In the subalpine, usually on rather dry places. The most similar species to the harebell is the pleated gentian which is shorter but with longer, darker-blue flowers and succulent, heart-shaped opposite leaves.

ECOLOGY OF PLANTS

Identifying a plant is only the first step in learning about its fascinating world. Having learned the name given it by others you may then want to know where it lives, and why, and the names of the species it lives with.

Given the proper set of environmental, soil, and historical conditions, plants form distinct *communities*, a fact of much value in understanding plant ecology. Once an assemblage of plants is recognised as a community, information can be applied which has been gathered from similar communities elsewhere, since the environment, soil, and history may be assumed to be about the same.

With several prominent plants identified, one may be able to put a name on the community to which they belong and quickly spot a variety of typical characteristics. For example, if many lupines and valerians are encountered in a subalpine meadow, undoubtedly this is a Lupine/Valerian community. Among the associated species to be expected are magenta paintbrush, mountain bistort, meadow parsley, Cascades huckleberry, cinquefoil, and mountain daisy. Study of the soil will show it to be deep, fine-textured, and moist and often formed into mounds several feet high.

Another easy-to-recognise subalpine assemblage found throughout the Cascades and Olympics is the Heather/Huckleberry community, dominated by red heather, white heather, and Cascades huckleberry. Associated species include the birdsbeak pedicularis, partridgefoot, pussytoes, avalanche lily, and magenta paintbrush. The soil is shallower, moister, and stonier than in the Lupine/Valerian community and forms flat or slightly concave slopes.

Other important communities can be learned with observation and practice, making the traveler feel at home wherever he walks.

So closely linked are plants and their environment we can not only characterize the environment by identifying plants but by noting the environment can predict the kinds of plants likely to occur.

Plants of high alpine ridges have several things in common. They are low-growing, often mat-forming, and usually have small leaves and deep, thick taproots or storage roots. Examples are spreading phlox, alpine aster, golden fleabane, yellow heather, and Lyall's lupine. They hug the ground because only there can they absorb enough warmth and be protected from fierce winds. The leaves are small partly from the diminutive size of the plants but also to guard against excessive drying and damage by the occasionally intense radiation from the sun. The deep, thick taproots provide anchorage, store food for the long winter, and supply energy to resume growth in the following spring.

Lower in the mountains, in the less severe environment of the subalpine meadows, plants are larger and more succulent than their alpine cousins and usually have bigger, showier flowers. Compare, for example, the subalpine lupine with its alpine relative, the Lyall's lupine, which is much smaller and grows in little clumps, its leaves covered with dense woolly hairs for protection from the sun. The golden fleabane of the high ridges has several counterparts in the subalpine meadows, all showier and more exuberant.

Lower yet, in the forest, where growing conditions are best of all and large trees dominate the land and control the environment near the ground, plants are quite different. Forest wildflowers have not been forced to develop defenses against sun and wind; they have not evolved such large, showy flowers because their reproduction is less dependent on flying, pollinating insects.

VEGETATION ZONES

The obvious differences between "forests" and "meadows" are useful in

separating two assemblages of similar plants. However, we can make finer distinctions, defining forested areas by the climax tree species and distinguishing between two kinds of meadows—the *subalpine*, with scattered trees, and the true *alpine* where conifers exist only as shrubs or not at all. Such logical groupings of similar plant groups are called *zones*.

The concept of *life zones*, developed in the late 19th century by C. H. Merriam, has been replaced by the more useful and accurate *vegetation zones*. Forest zones are named for the dominant climax trees; Merriam's names have been retained for the meadow zones.

For any given area vegetation zones are also, roughly speaking, elevational zones or belts. They usually include many characteristic and faithful species and invariably cover areas of relatively similar climate. The description of each flower in this book notes either its elevational range or vegetation zone, thereby conveying by implication much other information about the environment and associated species.

The principal vegetation zones in the North Cascades and Mount Rainier National Parks are the (forest) *western hemlock*, *Pacific silver fir*, *mountain hemlock*, *Engelmann spruce-subalpine fir*, and the (meadow) *subalpine* and *alpine*.

The *western hemlock zone* extends from the lowest elevations in the two National Parks up to about 2500 feet in the North Cascades and 3000 feet on Mount Rainier. It is found occupying moist river bottoms and flood plains as well as the lower mountain slopes. The dominant trees are western hemlock, Douglas-fir, western redcedar, bigleaf maple, red alder and at the upper limit, Pacific silver fir. In this zone are virgin stands of trees many hundreds years old and up to 12 feet in diameter, often with little understory vegetation except mosses and lichens; also here are the rainforests of the North Cascades. Important shrubs include vine maple, salal, red huckleberry, Oregon grape, and devil's club. Important herbs include twinflower, trillium, skunk cabbage, pink pyrola, pipsissewa, and vanillaleaf.

Next higher is the *Pacific silver fir zone*, which in the North Cascades may extend below 2500 feet in cool river bottoms and up to about 4500 feet, and on Mount Rainier to about 4900 feet. The dominant climax tree is Pacific silver fir. Its most common associates are western hemlock at the lower elevations and mountain hemlock at the higher; other trees include western white pine, Douglas-fir, Alaska—cedar, and noble fir in the south. This zone, which covers more of the North Cascades and Mt. Rainier National Parks than any other, is cool and moist, characterized by a permanent winter snowpack from about November to April or May, and coincides with the zone of greatest available precipitation. Because Pacific silver fir is not a long-lived tree, several generations without disturbance are sometimes required before others species die out and a self-perpetuating climax stand becomes established. Important shrubs include several species of huckleberries, devil's club, fool's huckleberry, and white rhododendron. Important herbs include bunchberry dogwood, trailing raspberry, queen's cup, twinflower, Indian pipe, coralroot, and calypso.

The *mountain hemlock zone* is the highest forested zone in the western Cascades. (On the drier east slopes it is replaced by the *Engelmann spruce-subalpine fir zone*.) The range is from about 4500 to 5200 feet in the North Cascades and 4900 to 5500 feet on Mt. Rainier. Frequently associated with the climax dominant, mountain hemlock, are subalpine fir, Pacific silver fir, and Alaska—cedar. Important shrubs include the thin-leaved huckleberry, mountain ash, fool's huckleberry, and white rhododendron. Important herbs include

Jacob's ladder, Merten's bluebells, trailing raspberry, and wood rush.

Meadows of the *subalpine zone* occur sporadically between the mountain hemlock or Engelmann spruce-subalpine fir forests below and either the alpine zone or bare rock above. This zone is dominated by perennial herbs or shrubs with an occasional tree or tree group. The range is from about 5100 to 6500 feet in the North Cascades and 5400 to 6900 feet on Mount Rainier. Three major vegetation types constitute the zone. First is the colorful, tall herbaceous type for which Paradise is famous, dominated by such showy herbs as Sitka valerian, subalpine lupine, magenta paintbrush, cinquefoil, anemone, and mountain bistort, plus fescue on drier ground. The Valerian/Lupine community, mentioned earlier, belongs to this type. Second are the heather meadows, the most common meadows throughout the Cascades, dominated by red heather, white heather, yellow heather, and Cascades huckleberry. Third is a group of low herbaceous or semi-shrubby communities occurring mostly on disturbed or very wet sites, with plants including black sedge, alpine aster, elephanthead, pussytoes, partridgefoot, and cinquefoil.

Highest of all is the *alpine zone*, found above 6700 feet on Mount Rainier and best developed on the northeast side of the mountain near Sunrise, and in the North Cascades above 6500 feet, scattered on only the highest peaks. The zone is treeless and often characterized by repeated freezing and thawing which churns the soil and intensifies the already harsh environmental conditions. Plants are low-growing, mostly cushion types, a form which takes best advantage of the warmth at the soil surface and avoids wind and snow damage. Coniferous species such as subalpine fir, mountain hemlock, Engelmann spruce, and white-bark pine may occur, but only as shrubby, low growing forms called "krummholz." Common plants include golden fleabane, Tolmie saxifrage, Lyall's lupine, crowberry, and yellow heather.

GLOSSARY

ANTHER—The fertile or pollen-bearing part of a stamen.

AXILLARY—Said of flowers or buds which are borne at the junction of a leaf and the stem.

BRACT—A modified leaf usually attached just beneath a flower or flower cluster.

CYME—A flower cluster in which the first flower to develop is the terminal one, the lower ones develop later.

DRUPE—A fleshy, one-seeded fruit, such as a cherry, with the seed enclosed in a pit or stone.

DRUPELET—A small drupe, usually occurring in clusters such as in the fruit of a raspberry.

GLANDULAR—Having or pertaining to small secreting structures which are usually sticky and are often found on the tips of short hairs.

KRUMMHOLZ—German for "crooked wood."

LEAF—The photosynthetic organ of a plant. A complete leaf is composed of a blade, petiole and stipules.

LEAFLET—The small leaf-like parts of a compound leaf.

MYCORRHIZAL—Where the roots of a plant are covered with a mantle of symbiotic fungus, without which many plants could not exist.

PETAL—A colorful, modified leaf which surrounds the reproductive parts of a flower.

PETIOLE—The stem or stalk of a leaf.

PETIOLATE—Having a petiole, as opposed to being sessile.

PINNATELY COMPOUND—Said of a leaf which is composed of leaflets, and where the leaflets are attached along the length of a stalk.

PISTIL—The egg-bearing or female part of a flower.

RACEME—A flower cluster in which the flowers are borne laterally on small individual stems along a stalk. The terminal flowers develop last.

SEPAL—A green or colored, modified leaf which surrounds the petals and the reproductive parts of a flower.

SESSILE—Where a leaf lacks a petiole and the blade attaches directly to the stem.

SPIKE—A flower cluster in which the flowers are borne laterally along a stalk, but without small stems as in a raceme.

STAMEN—The male or pollen-producing part of a flower.

STIGMA—The sticky, pollen-catching end of a pistil.

STIPULE—A leafy or spiny appendage of a leaf, when present, found at the base of the petiole.

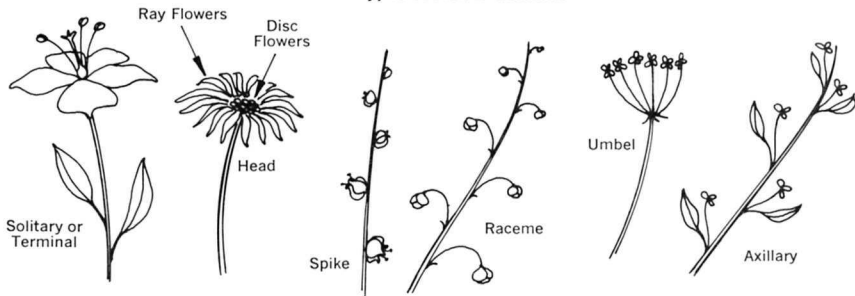
TERMINAL—Borne at the end of a stem or stalk.

UMBEL—A flat-topped flower cluster whose branches arise from the same point.

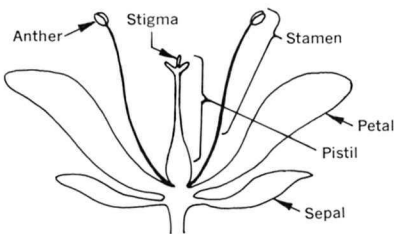
UMBELLATE—Like an umbel.

ILLUSTRATED GLOSSARY

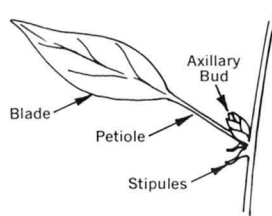
Types of Flower Clusters



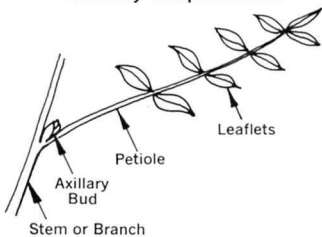
The Parts of a Flower



Parts of a Simple Leaf



Pinnately Compound Leaf



Palmately Compound Leaf

