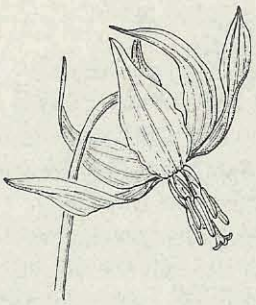


OREGON FLORA NEWSLETTER

Volume 5 Number 1 • Oregon State University • February 1999

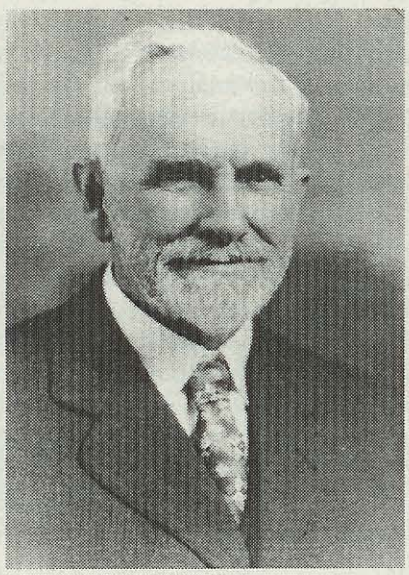
Louis F. Henderson (1853-1942), early Northwest botanist, Part I

by Rhoda Love

Louis F. Henderson was one of the most interesting and active of the pioneer botanists of the Pacific Northwest. He was an articulate writer who left voluminous descriptions of the landscapes and plants of our area as he observed them between 1877 and 1942. He was also an energetic outdoorsman who botanized in virtually every corner of Oregon, Idaho and much of Washington during his 65 years in the field. Of our early resident botanists, Henderson was the best educated and has left the most complete record. His life story is a fascinating one which demands a full-scale biography. It is almost impossible to do justice to the richness of his life in a brief biographical sketch such as this.

Louis F. Henderson, grandson of a US Senator, was born near Boston in 1853. His mother was a teacher and his father, son of the Senator from Mississippi, was a New Orleans lawyer. The family was in the South in 1861 when, due to complicated circumstances and the unexpected start of hostilities between the north and south, young Louis, his mother and brother were forced to remain on a poor farm in

See Henderson, page 2



L.F. Henderson
Archival photo, University of Oregon Knight Library

In shooting stars, little things mean a lot

by Kenton L. Chambers

In his *Synoptical Flora of North America,* published in 1878, the Harvard botanist Asa Gray—a pre-eminent figure among 19th century American taxonomists—treated the Shooting Star genus *Dodecatheon* (Family Primulaceae) as comprising a single species *D. meadia*, divided into seven varieties. Only a decade later, Edward L. Greene, a professor at the University of California, commented that Gray had "a mere herbarium acquaintance with the plants," whereas "knowledge of the plants...in the living state, either on their native soil or in gardens" was necessary to "diagnose the species."

Confident of his abilities as a field naturalist and collector of western American plants, Greene began in 1888 to divide *Dodecatheon* into numerous separate species. Over several decades he described 18 species and varieties in the western United States, while other botanists of the early 1900s, including C. V. Piper, Alice Eastwood, P. A. Rydberg, Thomas Howell, and Aven Nelson also "diagnosed" many additional new species of the genus. Apparently, in the eyes of Asa Gray, all shooting star plants looked pretty much alike, while to botanists who knew *Dodecatheon* in its native haunts, numerous differences could be found, if one looked closely enough.

In general terms, it would seem that Gray's interpretation of the genus, which is confined to North America and adjacent Siberia, as a single, highly variable species was understandable. The flowers of shooting stars have a distinctive, easily recognized pattern, and the supposed species differences are merely minor variations on a single floral theme. The pendant flowers with upraised reddish-purple petals and projecting cone-shaped anthers are adapted to pollination by bees, which gather pollen by grabbing the petals and vibrating the flowers with a buzzing of their wings. Similar "buzz-pollinated" flowers are found in genera of the potato family, such as *Solanum* and *Lycopersicon,* and perhaps in the liliaceous genus *Erythronium.* No species of *Dodecatheon* diverge from this pollination system, so their flowers must inevitably maintain the same architectural *bauplan.*

In the Oregon Vascular Plant Checklist we recognize nine species of *Dodecatheon,* with two additional subspecies under one species, *D. pulchellum.* This comes close to the eight

See Dodecatheon, page 4

Project News

The Oregon Flora Newsletter is entering its fifth year! The mailing list consists of 525 individuals and institutions.

We next plan to publish a checklist of monocots, other than the grasses, as a booklet similar to the Asteraceae Checklist we published last year. After this volume, we will publish miscellaneous dicot families as drafts become available. Recently, Ken and Henrietta Chambers have been particularly active in completing checklist treatments.

Twelve students and several volunteers are currently working on the Flora project. The Oregon Plant Atlas Project database now has 117,000 records (see map on back page). In addition there are about 20,000 records in the herbarium specimen database. Charlene Simpson is helping us check the database for accuracy and adding information needed for mapping. Jason Alexander is redesigning the herbarium database so that it better conforms with the Atlas Project. A top priority is to put together a demonstration of the electronic Atlas, using data on *Senecio* species and the Java computer program written by Clay Gautier.

Illustrations of *Erythronium oregonum* on the front and back covers by Linda Ann Vorobik.

The Oregon Flora Newsletter is published three times a year by the Oregon State University Herbarium and the Oregon Flora Project. The Editor is Rhoda Love and the Production Assistants are Alisa Anderson and Aaron Hodges.

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Henderson, continued from front page

Mississippi throughout the Civil War. They survived and were reunited with his father only to be faced with a family tragedy. The father, an abolitionist, was brutally murdered by angry whites during a New Orleans race riot in 1866. Moving back north with his mother and older brother, Henderson attended Cornell University, studying languages and botany. After graduation, he came West, first to California and then to Oregon. From approximately 1877 to 1889, Henderson was a teacher at Portland High School. During this time he started collecting and began to build a large personal herbarium.

In 1883, after what his daughter called a "whirlwind love affair," Henderson and fellow-teacher Kate Robinson were married in Portland. Their two daughters, Margaret and Connie were born in 1886 and 1888. In 1889 typhoid fever forced Henderson to resign his school position and move his family to Olympia, Washington to recuperate near the home of his brother Leland. By 1890, he had recovered sufficiently and he joined the O'Neil Expedition to explore the interior of the Olympic Peninsula. Later, he accepted a position with the State of Washington to collect plants for the state's display at the 1893 Chicago World's Fair. He and his family then moved temporarily to Chicago to set up the Washington State exhibit.

After leaving Chicago in 1893, Henderson became the first professor of botany at the new University of Idaho in Moscow, where the family lived until his daughters completed college in 1911. They bought a farm which they called "Dingly-Dell" about seven miles outside of Moscow. The Henderson girls were popular and Dingly Dell became the site of many young peoples' parties. Kate busied herself in Moscow founding a woman's service club and helping bring the first public library to Moscow. In 1900, Henderson and Kate spent a sabbatical year at Harvard University, which he later described as "the most enjoyable year I ever spent in my life." Botanist C. V. Piper of Washington State College was also on sabbatical at Harvard that year, and the Hendersons and the Pipers made a happy foursome enjoying concerts and museum tours.

During the Idaho years, Henderson collected steadily when he was not teaching. For example in 1895, from the first of June to the end of September, he and a student covered thousands of miles on foot in central Idaho. Then disaster struck. Henderson had deposited his own extensive personal herbarium of 10,000 sheets — the result of nearly 30 years of collecting — at the University, only to see it destroyed when the Administration building burned to the ground in 1906. It was estimated at the time that nearly 85,000 herbarium specimens were destroyed, most collected by Henderson.

He was then 52 years old and had lost what he called "one of the joys of my life."

[Editor's note: This brief biography of L. F. Henderson will be completed in the next issue of the Oregon Flora Newsletter.*]*

The family Fagaceae in Oregon
Part II: the Oaks

by Henrietta Chambers

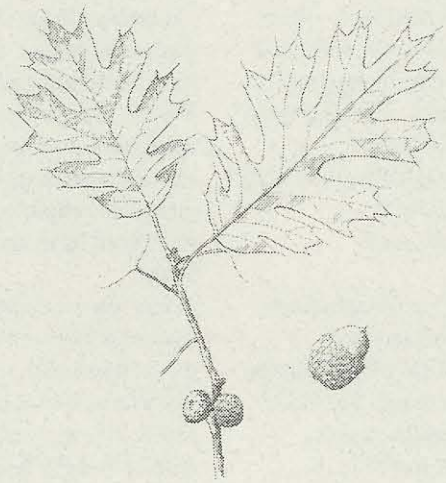
(Editor's note: Part I of Dr. Chambers' article on the family Fagaceae appeared in the October, 1998 issue of OFN.*)*

The genus *Quercus* in Oregon is represented by five species, plus one named and several unnamed hybrids. If we divide them into three groups, White Oaks, Red or Black Oaks, and Golden-cup Oaks, we can note similarities and differences among certain of the taxa. Following are the major features of each group and the species that occur in Oregon.

White Oaks - Leaves deciduous (ours), lobed but without awned teeth; acorns take one year to mature; cup scales may be tomentose but not embedded in the pubescence [species in Oregon: *Quercus garryana*].

Red or Black Oaks - Leaf blades, if lobed, then with awned teeth (if entire, then often with a bristle at the leaf apex); acorns generally take two years to mature; cup scales are not embedded in tomentum [*Q. kelloggii* and *Q. sadleriana*].

Golden-cup Oaks - Evergreen with leathery, entire or awn-toothed leaves; acorns take two years to mature; cup scales are embedded in tawny or glandular tomentum [*Q. chrysolepis* and *Q. vaccinifolia*].



California black oak (Quercus kelloggii)

Illustration by Jeanne R. Janish from Hitchcock et al. 1969, Vascular Plants of the Pacific Northwest, *courtesy of Universtiy of Washington Press.*

Many oak hybrids have been reported and named, particularly within the White and Red/Black groups. In most cases, hybridization results in solitary trees or small groups of intermediate individuals. Occasionally hybrid populations occur which cover a large geographic range.

Our single White Oak species, *Q. garryana* Douglas ex Hook var. *garryana* (Garry oak) is the most conspicuous and widespread of Oregon's oaks. These trees occur at low elevations from British Columbia to California. A shrubby or small tree variant, var. *breweri*, once considered a separate species, occurs at 1400-1900 m in elevation in the Siskiyou region of northern California and southern Oregon. Very few of the herbarium specimens of this taxon designate the size of the tree that the twig has come from, but the buds of var. *breweri* are generally small, rounded and reddish, while those of var. *garryana* are more elongate and yellowish to cream in color.

Quercus kelloggii Newb. (California black oak) is widespread in California and occurs in Oregon as far north as Lane County. The trees are up to 25 m in height with deciduous leaves that are lobed and have teeth with bristles. The distinctive acorns have a cap that covers approximately three-fourths of the nut, and the scales are broad and up to 4 mm in length.

[Do *Quercus garryana* and *C. kelloggii* hybridize where they come in contact in southern Oregon? Anecdotal evidence from the Eugene area suggests that they may, but as far as we know, the hypothesis has not been tested. Editor]

Quercus sadleriana R. Br. (Sadler's oak) is endemic to a small area that spans the Oregon-California border in the Siskiyou Mountains. This shrub species is one of the most distinctive western oaks. The large (up to 14 cm long), evergreen leaves are obovate to elliptic and have prominent veins and coarsely serrate margins.

Quercus x *morehus* Kellogg (oracle oak) is a hybrid between *Q. kelloggii* and *Q. wislizeni* A. DC (Sierra live oak, interior live oak), a widespread California species that includes trees and shrubs. The hybrids are known from several populations that occur from northern Douglas County to southern Josephine County as well as California. The entire to spinose margins of *Q. wislizeni* are apparent in the leaves of the hybrid, which are quite intermediate between the two parents.

Quercus chrysolepis Liebm. (canyon live oak, maul oak) is a widespread and variable species that occurs on ridges, canyons and rocky slopes from 200-2600 m in elevation. These plants range from medium-sized trees to shrubs. The evergreen leaves can be oblong or acuminate, and the margins vary from entire to spinulose-dentate. Both leaf forms may occur on the same plant. The lower leaf surface has a dense layer of golden, glandular and multiradiate hairs, especially early in the season. The acorn cap varies from saucer-shaped to turbinate; the acorns are oblong to fusiform. This species grows from Mexico to southern Oregon and east to New Mexico and Nevada. Its great diversity led earlier workers to name several varieties, but more recent study does not support the recognition of subspecific taxa.

Quercus vaccinifolia Kellogg (huckleberry oak) is a shrubby evergreen species that grows on dry ridges and rocky slopes from 900 to 2800 m from northwestern Nevada to northern California and southern Oregon (Josephine and Curry Counties). These low shrubs are prostrate or erect and up to 1.5 m tall. Their leaves resemble those of huckleberry but have a more leathery texture. The leaves may be entire or have irregular, mucronate teeth. This taxon can be distinquished from *Q. chrysolepis* by the absence of glandular trichomes on the undersides of the leaves, which are glaucous below, and by thinner acorn cups and smaller nut-attachment scars. These two species of golden-cup oaks hybridize at lower elevations in northern California and southern Oregon.

Dodecatheon, continued from front page

species and three additional varieties mentioned in *Flora of the Pacific Northwest*. One Oregon species, found in the northwest coastal counties and adjacent Washington, has yet to be formally described. A complete treatment of the genus, published by H. J. Thompson in 1953, was relatively conservative in recognizing 14 species and 13 additional subspecies in North America. This is a long way from the single species envisioned by Asa Gray, but it is fewer than the large number named by Greene and his contemporaries early in the present century.

Shooting stars show their greatest diversity in the Pacific Coast states, occupying a wide range of environments—from arctic and alpine tundra to mountain meadows, wet cliffs and rocky riverbanks, serpentine seeps, oak woods, moist prairies, summer-dry grasslands, and sagebrush deserts. Lacking floral differences, the species have evolved ecological and geographical barriers to intercrossing. Additionally, polyploid differences in chromosome numbers may prevent hybridization, even between plants within the same morphologically defined species.

The "little things that make a difference" in *Dodecatheon* taxonomy include minor variations in stigmas, anthers, capsules, petal numbers, leaf shape, and pubescence. The key to species in *Flora of the Pacific Northwest,* pages 352-353, illustrates these traits quite well. I found that the stigma, anther, and pubescence features are well preserved in herbarium specimens; mature capsules, however, are seldom collected. In only a few species is leaf shape consistent enough to be useful. White-flowered forms occur in several species, but only in *D. dentatum* is this trait consistent. Similarly, 4-petalled flowers are uniformly present only in *D. alpinum* but are sporadic in some other species. A list of the Oregon taxa, with some of their important features and their geographic range in the state, is given below:

Dodecatheon alpinum: Style with an enlarged "pin-head" stigma; petals and anthers *four*; filaments free; tissue between the anther sacs ("connective") transversely wrinkled; plants glabrous; mountain stream-banks and meadows [closely allied with *D. jeffreyi*].

Dodecatheon jeffreyi: Style with an enlarged "pin-head" stigma; petals and anthers usually *5*, rarely 4; filaments free; anther connective transversely wrinkled; plants glabrous or more often lightly glandular-pubescent, especially the inflorescence; mountain streambanks, marshes and meadows [plants often larger than *D. alpinum*].

Dodecatheon cusickii: Stigma not enlarged; filaments united basally into a *yellow* tube 1.5-2.5 mm long; anther connective smooth; whole plant densely *glandular-pubescent*; grasslands and sagebrush lands east of the Cascade Mtns. [closely allied with *D. pulchellum*].

Dodecatheon poeticum: Stigma not enlarged; filaments united basally into a *purplish* tube 1.5-2.0 mm long; anther connective smooth or transversely wrinkled; whole plant densely *glandular-pubescent*; oak woods, grasslands, and basalt outcrops, Columbia River Gorge [closely allied with *C. cusickii*].

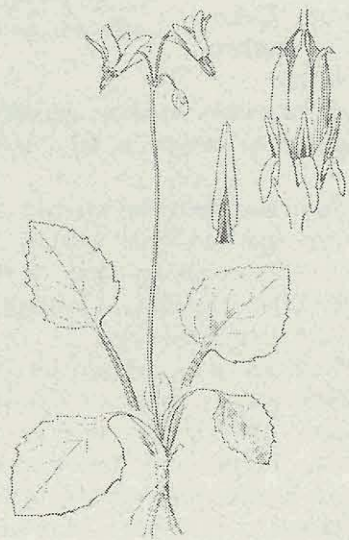
Dodecatheon hendersonii: Stigma not enlarged; filaments united basally into a purplish tube 2-4 mm long; anther connective smooth or transversely wrinkled; leaves *round to broadly obovate*, smooth-margined, glabrous; prairies and oak woods west of the Cascade Mtns.

Dodecatheon pulchellum: Stigma not enlarged; filaments usually united into a tube; leaves entire, usually glabrous; anther connective smooth. ssp. *pulchellum*: filament tube *yellow*; anthers 3.5-5.0 mm long; widespread east of the Cascade Mtns., from sagebrush lands to high alpine. ssp. *macrocarpum*: filament tube *yellow*; anthers 5.5-7.0 mm long; Columbia Gorge, Willamette Valley and adjacent foothills. ssp. *monanthum*: filament tube *purplish*; anthers 3.5-5.5 mm long; scattered sites east of the Cascade Mtns., Willamette Valley, and Siskiyou Mtns.

Dodecatheon conjugens: Stigma not enlarged; filaments *free*; anther connective strongly transversely wrinkled; leaves glabrous or lightly pubescent, often obovate, smooth margined; sagebrush lands to mountain meadows east of the Cascade Mtns.

Dodecatheon dentatum: Stigma not enlarged; petals white; filaments free; anther connective smooth; leaf blades glabrous, ovate, often with toothed margins; wet cliffs, often near waterfalls, Columbia River Gorge.

Dodecatheon species *novum*: Stigma not enlarged; petals reddish-purple; filaments free; anther connective smooth; leaf blades glabrous, oblanceolate, often with toothed margins; North Coast Range, on rocky peaks and bare basalt riverbanks, possibly also in the Siskiyou Mtns.



Dodecatheon dentatum, *the only consistently white-flowered shooting star in our flora. Illustration by Jeanne R. Janish from Hitchcock et al. 1969,* Vascular Plants of the Pacific Northwest, *courtesy of University of Washington Press.*

Ken Chambers initiates new Oregon Flora Herbarium Endowment

Professor Emeritus Kenton Chambers and his wife Henrietta have established a new Oregon Flora Herbarium Endowment Fund to help support the Oregon Flora Project. Ken recently sold a valuable 40-year stamp collection to provide the initial $28,000 funding for the endowment.

Ken has stated, "My interest in collecting stamps has been tapering off, and I felt that a better use for the value of the stamps would be to cash them in and make the money available for botanical research on Oregon's flora. Now that the new endowment has been created through the OSU Foundation, the hope is that other people may wish to add to it, specifically for the preparation of the much anticipated new Flora of Oregon."

As is usual with such endowments, the principal funds will not be tapped, but will gradually increase in value through the investment activities of the OSU Foundation. However, the annual interest on the account will be made available to the Herbarium to be spent in support of the Oregon Flora Project. Persons who wish to donate in support of the Flora of Oregon will now have a choice of where to donate funds — either directly as in the past through checks to the Foundation or the Friends Group, or to the new Oregon Flora Herbarium Endowment Fund. OFN readers may contact Scott Sundberg for more information about ways to support the Oregon Flora Project.

Karl Urban 1943 -1999

In 1995 Karl Urban wrote an article for the Oregon Flora Newsletter called, "Requiem for a laptop: seeds of the Oregon Checklist Project." In the article he described his seminal work on the Oregon Vascular Plant Checklist, which, as the article suggests, led to the untimely death of his laptop computer. It is with great sadness that we must announce his own untimely death. Karl passed away January 15 in Pendleton. Karl had an important role in the initiation and continuation of the Flora project. We miss him, both as a friend and as an accomplished botanist.

Thanks

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Tax-deductable donations can be made to the Oregon Flora Project by sending a check made out to the Oregon State University Foundation to Scott Sundberg at the address on this page. Please note on the check that it is for the Oregon Flora Project. Your donations go primarily toward newsletter expenses and student wages.

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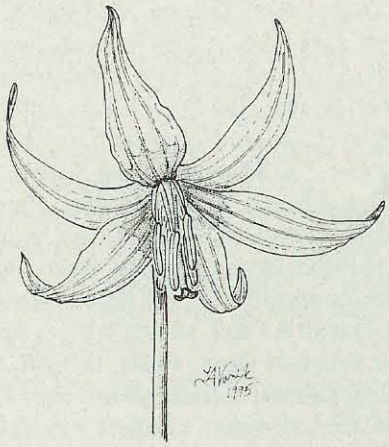
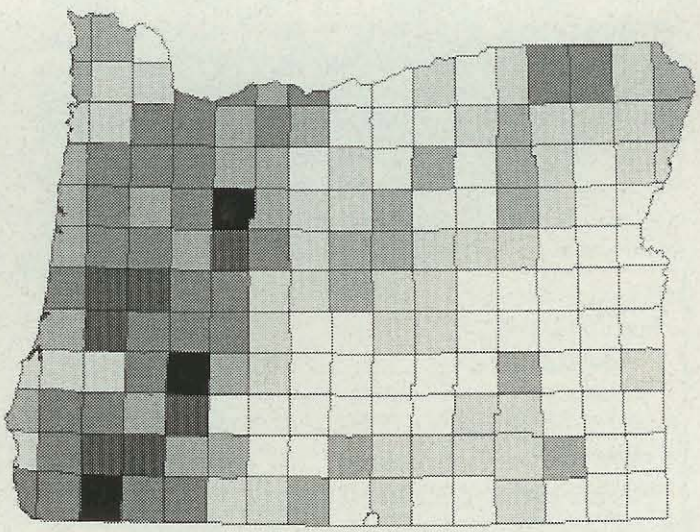


Did you know?

- The shooting star, *Dodecatheon hendersonii*, was named in 1886 by Harvard's Asa Gray for Louis F. Henderson, then a Portland high school teacher. This was one of only 2 species of *Dodecatheon* that Gray recognized in North America.

- In 1882, on a collecting trip with fellow botanist Thomas Jefferson Howell, Henderson noted hundreds of acres of tufted hairgrass (*Deschampsia cespitosa*) at Tillamook Bay. Today the Tillamook salt marshes have been mostly converted to pasture.

- In 1923, at the age of 70, Henderson swam across the Columbia River from Hood River to the Washington shore. The next year he became the first Curator of the University of Oregon Herbarium, a position he filled until he was 86 years old.



Number of species, subspecies and varieties per Atlas block in the Atlas database.

This summarizes data in a database of plant observations in January, 1999. The Atlas will also include herbarium specimen data. Tens or hundreds of thousands of records will eventually be added from other sources.

Ian Shackleford assisted with map production.