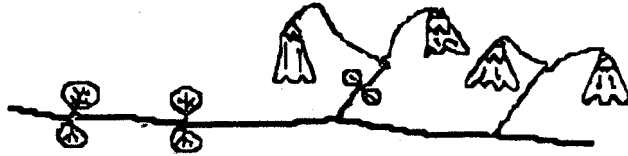


BOREALIS

published monthly
October thru May
by the

November 1988



ALASKA NATIVE PLANT SOCIETY

P.O. BOX 141613, Anchorage, Alaska 99514

MEETING NEWS

The November meeting of the Anchorage Chapter will be held on Monday, Nov. 7 at 8PM in Room 15 at Central Junior High School, on 15th Ave. between C & E Streets.

BOARD MEETING---The Board of Directors will meet at 7:15PM immediately preceding the General Meeting.

BUSINESS OF THE EVENING---Annual Election of the Anchorage Chapter. The nominating committee has presented the following slate of officers:

President-----Lynn Cattin
Vice-President-----Frank Pratt
Secretary-----Peggy Pletcher
Treasurer-----Larry Haller
Rep. to State Board-----Frank Bogardus

Additional nominations will be accepted from the floor at the November meeting. As soon as nominations are closed, the voting will follow. We urge you to attend and cast your votes for the candidates of your choice. If you cannot attend, but wish to vote, please write your choices on a slip of paper, and enclose it within 2 sealed envelopes (to maintain secrecy of balloting) and mail to the Post Office box indicated above to arrive no later than Saturday, November 5.

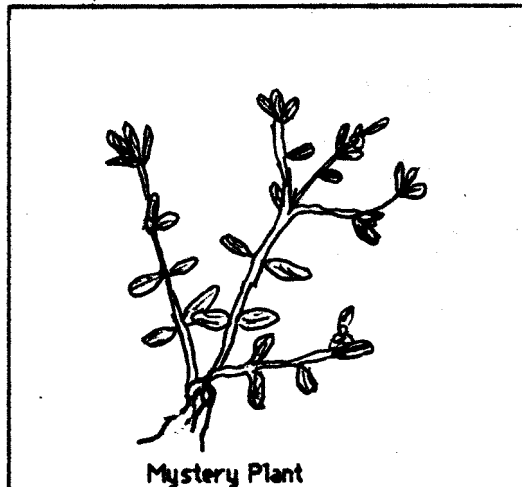
Please note that this election is for the Anchorage Chapter. Election of STATE Officers is in the Spring.

PROGRAM---"Plants of the Noatak and North Fork of the Koyukuk Rivers in the Gates of the Arctic National Park" will be presented by Nancy Michaelson, former naturalist with the Alaska State Parks.

PLANT FAMILY---Elaeagnaceae---Oleaster---presented by Verna Pratt. Worldwide, there are 3 Genera in this family and 50 species. In Alaska, we have 2 Genera; Shepherdia, with one species, Soapberry, and Elaeagnus, with one species, Silverberry. This family consists of woody shrubs having small flowers with 4 sepals, no petals, 4 or 8 stamens and a soft fleshy fruit with 1 seed.

MYSTERY PLANT

This very small annual plant could easily be overlooked except where it grows in profusion. It favors wet bare earth and is frequently seen along wet alpine meadow trails. The plant is very reddish, glabrous, with very small ovate leaves, and flowers borne singularly or in clusters. The tiny flowers usually have 3 (sometimes 4) greenish-white sepals, no petals, with an equal amount of stamens.



Mystery Plant

The following article was published in "Primroses", Quarterly of the American Primrose Society. 46:54.60 1988
The author, Sylvia "Tess" Kelso, an ANPS member earned her Masters Degree in Botany while studying the Primroses of Alaska, particularly the Seward Peninsula, while a student at UAA, Fairbanks.

The Primroses of Alaska

by Sylvia Kelso
Dept. of Biology, Colorado College
Colorado Springs, CO 80903

Oil and gold, glaciers and blizzards, giant grizzly bears and salmon, northern lights and the midnight sun: the State of Alaska is famous for all of these. But we should also add to the list of its many attributes a claim to being the state with the most number of native species of *Primula*. Nine species of primrose can be found there, a fact that may be surprising to those unacquainted with the flora of the North. These nine species represent four different sections of the genus. In section *Aleuritia*, we have *Primula anvilensis* (the Anvil Mt. Primrose), *P. borealis* (the Northern Primrose), *P. incana* (the Mealy Primrose), and *P. mistassinica* (the Mistassini or Bird's Eye Primrose). In section *Armerina* there is *P. nutans* (the Siberian Primrose) and *P. egalikensis* (the Greenland Primrose); in section *Cuneifolia* there is one species, *P. cuneifolia* (the Wedgeleaf Primrose), and finally, in section *Crystallophloia*, there are two species, *P. Tschuktschorum* and *P. eximia* (the Chukchi Primrose and the Extraordinary Primrose).

Why are there so many primroses in Alaska? Certainly the large size of the state with its diverse landscape offers many ecological opportunities. However, the basis for the plentitude of arctic primroses may lie in Alaska's

geographic position and the environmental changes that have occurred there in the last 100,000 years.

On a clear day at Cape Prince of Wales on the west coast of Alaska, the Cape Dezhnev cliffs on the Asiatic coast loom up only 50 miles away across the stormy Bering Strait. To the east, the mountain chains of the Seward Peninsula connect to the high peaks of the Brooks and Alaska Ranges, which in turn join the coastal and Cordilleran mountains on North America. Westward, the peaks of the Chukchi Peninsula link to the great Asiatic ranges: the Altai and the Himalayas. The Bering Strait region is not the only North American connection to Asia. The long chain of the Aleutian Islands reaches out across the time zones to merge with the coastline and islands of the North Pacific: the Commander Islands, Kamtchatka, the Kurile Islands, Sakhalin, and the Japanese Archipelago. Over many thousands of years, these links to Asia have provided highways for the migration of many plant species from the rich floristic regions of Asia to the North American continent. Undoubtedly, the famous *Primula* belt of mountainous Central Asia has been the ultimate ancestral home for many of the species we see in Alaska today.

But are all the Alaskan species Asian immigrants? Probably not. Alaska has had a fascinating environmental history during the past 100,000 years. During this period, lengthy episodes of

glaciation occurred over much of North America. Periods of cold temperatures and extensive ice-cover alternated with warmer periods when glaciers melted, and temperatures were as warm or warmer than they are today. These cycles of change drastically affected plant and animal species. Almost certainly extinctions occurred. Plants and animals migrated south and north, east and west. Some groups were isolated for long periods of time when glaciers cut them off from other populations of the same species. Climates changed, ecological conditions changed, and species changes with them.

Twenty to thirty thousand years ago in Alaska, alpine glaciers filled the mountain valleys, but most of the state and the lowlands of the neighboring Yukon Territory were ice-free. The picture was very different in the rest of North America: massive ice sheets covered most of Canada and northern United States, and Alaska was essentially cut off by the glacial ice in the Canadian Rockies. Gradually, the climate began to warm again, the glaciers retreated to the relatively few we see today, and the mountains once again became potential habitats and migrations routes for plants and animals.

I believe that these periods of isolation and traumatic climate change were critical for several species of Alaskan primroses. One species, the Anvil Mt. Primrose of northwestern Alaska, is most closely related to the eastern mistassini or Bird's Eye Primrose.

It probably developed from a branch of that species when Alaska was isolated from the rest of North America by long periods of extensive glaciation. While the Fairy Primrose can be found in Alaska today, it is quite rare, and most likely migrated north along river valleys later in the postglacial era.

The cases of the Wedgeleaf Primrose and the two close relatives, the Chukchi Primrose and the Extraordinary Primrose, are quite similar. Here I believe that ecological changes, particularly the loss of critical pollinators, led to the development of the forms we see today.

Primrose enthusiasts all know that many species have two forms of flowers called pin and thrum, that differ in the placement of their reproductive organs. These must be crossed in order for successful seed set. This reproductive system called heterostyly was first studied in detail by Charles Darwin. For heterostylous species, insect pollinators are crucial. If pollination and seed production are not successful over a long period of time, the species may be doomed to extinction.

Not all species of *Primula*, however, are heterostylous. There are some homostylous species, and in these, the reproductive organs are set close together and flowers are able to self-fertilize. Genetically we know that only a simple mutation is required to convert heterostyly to homostyly. However, as many plant breeders are well aware, prolonged self-fertilization may lead to the expression of deleterious genes and weak or inferior individuals. Thus, while mutations to homostyly

may occur frequently in heterostylous primroses, only rarely does a homostylous species succeed in getting established.

The origin of the Alaskan primroses is quite complex and involves some fascinating stories in plant evolution. Of course, we cannot see the past to know for certain from where they came, but thoughtful speculation and ecological detective work is part of the fun of plant geography.

Alaska is a bridge between East and West and its flora reflects that position as a crossroads. But, Alaska is a unique place as well, and as truly native Alaskans, the endemic primroses there exemplify well its specialness.

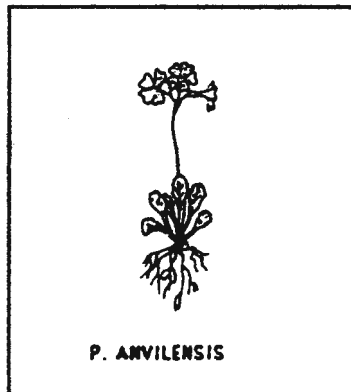
SECTION ALEURITIA (Farinosae)

Primula Anvilensis Kelso
"Anvil Mountain Primrose"
Named for Anvil Mountain in the Nome area.

Range: Endemic to the Seward Peninsula or Northwestern Alaska.

Habitat: Gravelly limestone slopes, stream banks, and snowbeds.

Description: A small delicate plant characterized by a few-flowered umbel, white flowers with a yellow throat, flat bracts, and efarinose denticulate leaves.
Heterostylous.



P. ANVILENSIS

Primula borealis Duby "Northern Primrose"

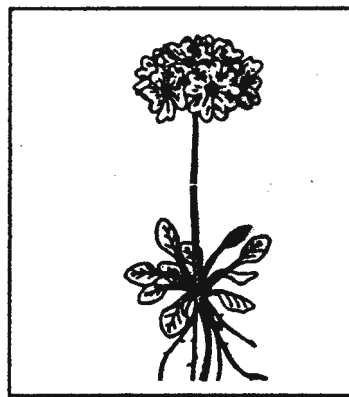
Range: Mackenzie River Delta in the Yukon south along the coast of Alaska to the Bering Sea.

Habitat: Salt marshes and dunes along the shore.

Description: A small plant characterized by a symmetrical umbel of violet flowers, saccate bracts, and farinose flowers.

Heterostylous. Often found growing with the Siberian Primrose, *P. nutans*, *P.*

borealis closely related to the Japanese species *P. modesta* and is probably a derivative that arrived in Alaska via the Bering Sea route.



P. BOREALIS

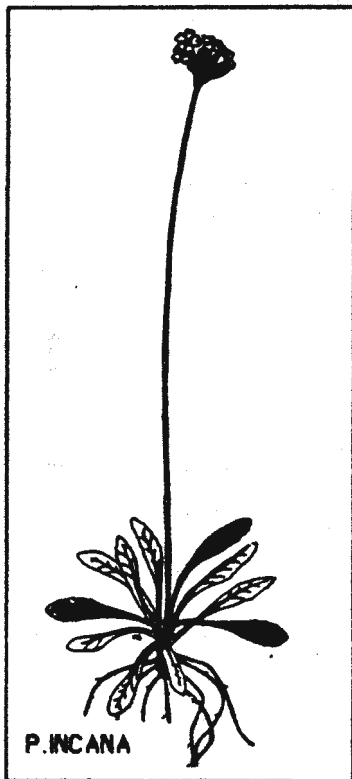
Primula incana Jones "Mealy Primrose"

Range: In Alaska known only from the interior, particularly along the Tanana River and its tributaries. Otherwise, known from the Canadian Prairie Provinces and south to Colorado.

Habitat: Alkaline clay river flood plains in successional plant communities.

Description: A tall slender plant with a tight umbel of tiny lavender flowers, and a distinctive heavy coating of white or cream-colored farina. Homostylous.

(drawing on next page)



NOTE: Most Alaskan floras list the arctic species *Primula stricta* Hornemann as present in Alaska. These records are based on misidentifications of several species, including *P. anvilensis* on the Seward Peninsula, *P. incana* in the interior of the state, and *P. borealis* on the north coast. *Primula stricta* is a high arctic maritime species found in the Canadian Arctic Archipelago and the European Arctic; in North America it is not found west of the Mackenzie River delta.

SECTION ARMERINA
(Farinosae)

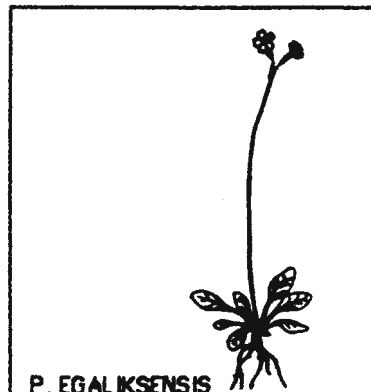
Primula egaliksensis
Wormskjold

"Greenland Primrose"
Named for a location called Igaliko in Greenland where it was discovered.

Range: Infrequent, but found throughout all of Alaska, across northern Canada east to Greenland, and south to two isolated locations in Colorado and Wyoming.

Habitat: Cold mossy streambanks.

Description: A small and inconspicuous species, characterized by 1 or 2 tiny white or lavender flowers, and efarinose ovate or elliptical leaves. Homostylous.



Primula nutans Georgi
"Siberian Primrose"
(formerly called *P. sibirica* Jacq.)

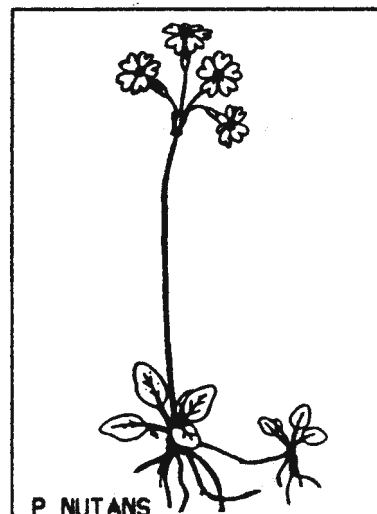
"Nutans" means nodding, a reference to the drooping flowers.

Range: In Alaska common along the west coast of the Bering Sea and the coastal Seward Peninsula. Known also from a few locations in the interior in the Yukon-Tanana Uplands.

Habitat: Along the west coast, in salt marshes and saline bogs. In the interior found in cold, wet, freshwater bogs.

Description: A heterostylous species that is superficially similar to the Northern Primrose, but easily distinguished by its fewer lavender flowers on droopy pedicels, distinctive auriculate bracts, and efarinose ovate leaves. *Primula nutans* is also known from northern Europe across the steppes of Central Asia. It may have been more abundant in North America prior to the glaciations. If so, the Alaskan populations represent relicts that survived only in the unglaciated lowlands of the north.

Interestingly, this species is the only one of the northern primroses that sometimes reproduces vegetatively by runners.



Primula mistassinica Michaux
"Mistassini or Bird's Eye Primrose"

Named for Lake Mistassini in Quebec

Range: Very rare in Alaska, known from a few scattered locations in the Alaska Range, along the Tanana River, and the western Brooks Range.

Otherwise known from across the boreal forest region from Newfoundland to the Yukon.

Habitat: Riverbanks.

Description: A variable species, with 2-3 violet flowers, flat bracts, and efarinose denticulate leaves. Heterostylous.



**SECTION CRYSTALLOPHLOMIS
(Nivales)**

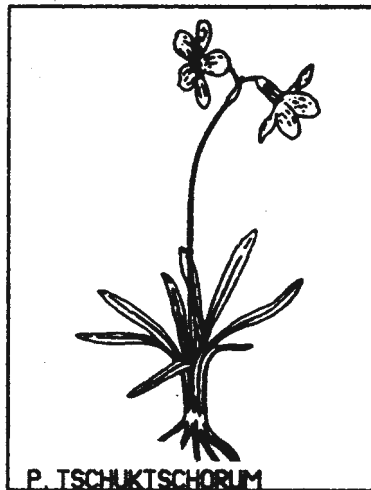
Primula Eximia Greene
"Extraordinary Primrose"
The specimen used by Greene to name this species was dramatically large and robust, probably from the effects of massive amounts of bird fertilizer. St. Mathew Island in the Bering Sea from which it was described, is known for its abundant seabird colonies. Range: The Aleutian Islands north along the west coast of Alaska and south along the south coast, inland throughout the Alaska Range east to the Mackenzie Mountains in the Yukon. Habitat: Late snowbeds along coastal bluffs and ravines, in the mountains in alpine herb and herb-sedge communities and in streambeds.



Description: I have distinguished this as a separate species from its close relative *P. tschuktschorum* (see Kelso, S. 1987. *Primula tschuktschorum* Kjellm. and *Primula eximia* Greene: a distylous species and its homostylous derivative from Alaska. Brittonia 39: 63-72) on the basis of its consistently larger size, broader leaves, and more numerous homostylous flowers. It is

usually a robust plant with an umbel of large magenta flowers and fleshy farinose leaves. Both *P. tschuktschorum* and *P. eximia* are closely related to *P. nivalis* Central Asia.

Primula tschuktschorum
Kjellman
"Chukchi Primrose"
Range: a rare endemic of the Bering Strait region, including the Chukchi Peninsula in the USSR, St. Lawrence Island, and the Seward Peninsula in Alaska. Habitat: frost boils and late snow beds. Description: This is a small and delicate species with very narrow linear leaves, and 1 or 2 heterostylous magenta flowers. Its rarity is of concern, and the species is a candidate for the threatened and endangered plant list in Alaska.



SECTION CUNEIFOLIA

Primula cuneifolia Ledebour
ssp. *cuneifolia* "Wedgeleaf Primrose"
Range: Known only from the western Aleutian Islands of Attu, Agattu, and Adak. In Asia, common in the Commander and Kurile

Islands, Kamtschatka and northern Japan. Habitat: Moist herb meadows. Description: This subspecies differs from its relative ssp. *saxifragifolia* in having larger heterostylous flowers, and a taller stem. The leaves are efarinose, with broad teeth, and the flowers are pink.

Primula cuneifolia ssp. *saxifragifolia* (Lehm.) Smith & Forrest
Range: The Aleutian Islands north and south along coastal Alaska, and throughout the mountains of the interior of the state. Also known from the coastal mountains of British Columbia.



QUIZ ANSWER:

Koenigia islandica
Polygonaceae or
Buckwheat family

YOUR TRAVEL DOLLARS CAN HELP THE ALASKA NATIVE PLANT SOCIETY!

Through an ongoing program, Sanctuary Travel Services is sharing its commissions with A.N.P.S.. 2% of the cost of all travel arrangements can be routed to this organization every time you travel! Best of all there is no extra cost!

The winter travel season is fast approaching; so please book through Sanctuary Travel and designate Alaska Native Plant Society as the organization of your choice.

- * COMPETITIVE PRICES
- * KNOWLEDGEABLE STAFF
- * TICKET DELIVERY PROGRAM
- * TOLL FREE 800 NUMBER OUTSIDE ANCHORAGE
- * SUPPORT FOR THE ALASKA NATIVE PLANT SOCIETY

***SANCTUARY TRAVEL
SERVICES,
INC.***



3701 EAST TUDOR RD.
ANCHORAGE, ALASKA
99507

(907) 561-1212 or Toll Free: 1-800-247-3149

ALASKA NATIVE PLANT SOCIETY
Treasurers Report
Year-To-Date
September 30, 1988

Opening Balance, 1/1/88 \$1,340.19

Receipts

Membership Dues	\$ 1,110.00
Sale of Original Art	-0-
Sale of First Annual 1985 Prints	272.25
Sale of Second Annual 1986 Prints	265.00
Sale of Third Annual 1987 Prints	102.50
Sale of Fourth Annual 1988 Prints	171.50
Sale of Decal Stickers	3.00
Sale of Sew-On Patches	7.00
Sale of Seeds	113.50
Contributions to Scholarship Fund	-0-
Contributions to Eklutna Lake Project	105.50
Unrestricted Contributions	50.00
Advertising	31.00
Prepaid Postage; Sales Items	2.40
Rebates from Sanctuary Travel Agency	208.43

2,442.08

Disbursements

Newsletter Postage	238.00
Business License	25.00
Fourth Annual 1988 Prints (750)	1,434.50
Post Office Box Rent	29.00
Seed Sale Envelopes	12.55
Administrative Supplies/Postage	114.44
One half of Revenue from Sale of Original Art	-0-
Postage; prepaid on sales items	-0-

(1,853.49)

Closing Balance, 9/30/88 \$1,928.78*

* Includes \$75.00 (current as well as prior years) cumulative contributions to scholarship fund which are restricted funds

There are 137 paid members at 9/30/88

Respectfully Submitted,
Larry Haller, Treasurer



Alaska Native Plant Society
P.O. Box 141613
Anchorage, AK 99514

