

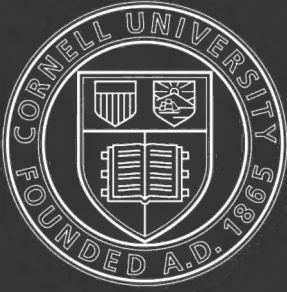
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A list of the plants of the Pribilof Isl



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A LIST OF THE PLANTS OF THE
PRIBILOF ISLANDS,

WITH

NOTES ON THEIR DISTRIBUTION.

BY

JAMES M. MACOUN,

Assistant Naturalist to the Geological Survey of Canada.

(Extracted from *The Fur Seals and Fur-Seal Islands of the North Pacific Ocean*,
Part III, pp. 559-587, Plates LXXXVII-XCIV.)

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XXIII.—A LIST OF THE PLANTS OF THE PRIBILOF ISLANDS, BERING SEA. WITH NOTES ON THEIR DISTRIBUTION.

By JAMES M. MACOUN

Assistant Naturalist to the Geological Survey of Canada.

This list is believed to include all the plants that have been found on the Pribilof Islands since their discovery in 1786. The early travelers who made such complete collections on Unalaska and other islands of the Aleutian chain seem to have spent very little time on the Pribilof Islands, only 35 species being recorded from them in Ledebour's *Flora Rossica*. I have been able to find no record of any collection having been made there between the time of Chamisso and Eschscholtz and the purchase of Alaska by the United States. Mr. Charles Bryant, in 1875, made a large collection on the Pribilof Islands. A set of these plants is in the United States National Herbarium at Washington, and, I believe, in the Gray Herbarium also. In 1890 Mr. William Palmer collected about 100 species of flowering plants there, and many mosses and lichens. The phaenogams were determined by Mr. Theodor Holm, the mosses by Dr. Kindberg, the lichens by Mr. Calkins. In 1891 Dr. C. H. Merriam, one of the United States Bering Sea commissioners, made extensive collections (over 90 species) on both St. Paul and St. George islands, and in 1892 published a list of the plants he had collected.¹ In 1895 Messrs. F. W. True and D. W. Prentiss, jr., brought from the Pribilof Islands a very fine collection of flowering plants (90 species). Their specimens are the best I have seen from that region. They were determined by Dr. J. N. Rose and are in the National Herbarium at Washington.

My own collections were made in the years 1891, 1892, 1896, and 1897, principally on St. Paul Island, and comprise 182 species and varieties of phaenogams and vascular cryptogams. In 1897 I had ample time at my disposal, and had then seen the collections of other visitors to the islands, so that I was able to greatly extend the number of species collected by me in former years. Reference is made in the text to the species that I failed to find. St. George Island has never been well botanized, and future collectors on that island will probably add many species to this list.

Through the courtesy of Mr. F. V. Coville and Dr. J. N. Rose, the curator and assistant curator of the United States National Herbarium, I have been enabled to examine all the Pribilof Island plants in that herbarium, and have admitted no species into the present list of which I have not seen specimens.

¹ Proceedings of the Biological Society of Washington, Vol. VII, pp. 133-150.

For the use of books from their private libraries and much kindly assistance in the preparation of this paper I have to thank my friends Dr. Edw. L. Greene, Mr. Theodor Holm, and my father, Prof. John Macoun. Mr. Holm's beautiful and correct figures of new species were made after a careful study of the plants they represent. Species which I considered new have been described by specialists, and other difficult species have been submitted to botanists who have made a special study of the groups to which they belong—the Carices to Messrs. Bailey, Kukenthal, Holm, and Wheeler, the grasses to Prof. Scribner—but I have in every instance given the result of my own work. Where I have failed to agree with others who have examined my specimens I have given the result of their investigation as well as my own.

Dr. Nils C. Kindberg, Dr. J. W. Eckfeldt, Pastor J. S. D. Branth, and Dr. C. Warnstoff have verified or corrected my determinations of the cryptogams.

BRIEF DESCRIPTION OF THE PRIBILOF ISLANDS WITH SPECIAL REFERENCE TO THEIR VEGETATION.

Dr. Merriam's description of the natural features of the Pribilof Islands is so good that I shall not attempt to improve upon it. He says:

The Pribilof group in Bering Sea is about 350 kilometers (220 miles) north of the Aleutian chain and comprises the islands St. Paul and St. George, separated by about 64½ kilometers (40 miles) of sea, and two islets, known as Walrus and Otter islands, near St. Paul. St. Paul is the largest, measuring about 23½ kilometers (14 miles) in length by 12 kilometers (7½ miles) in greatest breadth. St. George is a little less than 19.3 kilometers (12 miles) in length by a little more than 8 kilometers (5 miles) in greatest breadth. The highest land is on St. George, where a precipitous cliff fronting the sea and a hill in the interior exceed 275 meters (900 feet). The highest land on St. Paul is a little over 183 meters (600 feet). The group is of volcanic origin and the general surface is rolling with precipitous cliffs along the water front in many places, alternating with broad valleys and basins. The cliffs predominate on St. George. In summer the islands are almost constantly enveloped in fog. The atmosphere is saturated (the wet and dry bulbs registering the same) and the temperature is uniformly low, the thermometer ranging from 7° C. (45° F.) to 9° C. (48° F.), or rarely 10° C. (50° F.).

The sandy shores and dunes of the Pribilof Islands support a very scant vegetation. *Cochlearia officinalis*, *Arenaria peploides*, and *Elymus mollis* are the characteristic species. *Lathyrus maritimus* and *Mertensia maritima*, though not rare, are far from common, and these five species are the only shore plants that were seen. A few plants that are not of general distribution grow on cliffs near the sea. Among these are *Draba hirta*, *Nesodraba grandis*, *Arabis ambigua*, *Sagina linnaei* and *Saxifraga bracteata*. Near the village on St. Paul Island and elsewhere on the lower levels on both islands the ponds and lakes are surrounded by mud flats, on which a number of species grow that are not found elsewhere. The commonest of these are *Ranunculus hyperboreus*, *Ranunculus reptans*, *Montia fontana*, *Stellaria humifusa*, and *Potentilla anserina*. *Chrysanthemum arcticum* is sometimes found with them, but is commoner in wet places on higher levels, especially on St. George Island.

The number of bog and marsh plants is very small, though many of the species that grow elsewhere are also found on the damp, boggy spots that are so characteristic of both islands. There is but one true bog on St. Paul Island, several on St. George. On these *Rubus chamaemorus*, *Saxifraga hirculus*, *Pedicularis sudetica*, and *Petasites frigida* grow in profusion, but they are all found on other parts of the island.

The greater part of the surface of both islands is tundra-like and much resembles the barren grounds of arctic America. The commonest plants throughout the wind-

blown and elevated parts of the islands are *Silene acaulis*, *Arenaria macrocarpa*, and *Eritrichium chamissonis*, all forming cushions a foot or more in diameter, *Eutrema edwardsii*, *Papaver radiculatum*, *Geum rossii*, *Potentilla villosa*, *Artemisia globularia*, *Campanula lasiocarpa*, *Pedicularis langsdorffii*, and *Pedicularis lanata*. On the more exposed places and of not nearly so general distribution are *Cardamine bellidifolia*, *Lychnis apetala*, *Chrysosplenium beringianum*, *Saxifraga davurica*, *Saxifraga serpyllifolia*, *Aster sibiricus*, and *Gentiana glauca*.

Grassy banks and upland meadows are frequent, generally near the sea, and on these grow many species that are not found on the bleaker and more elevated parts of the islands. Conspicuous among these are *Ranunculus altaicus*, *Ranunculus Eschscholtzii*, *Valeriana capitata*, *Taraxacum officinale* var. *lividum*, two species of *Polemonium* and *Pedicularis verticillata*. *Claytonia sarmentosa*, *Viola langsdorffii*, *Gentiana frigida*, and *Primula eximia* are sometimes found with the above species, but are more common in damp sheltered places among the rocks in the interior of St. Paul Island. On one bank near a little pond at the southwest end of St. Paul Island I found *Coptis trifolia*, *Geranium erianthum*, *Arnica unalaskensis*, and *Veronica stelleri*, not seen elsewhere on the Pribilof Islands.

There are many level areas of considerable extent on both islands, called by Dr. Merriam "moss-bogs," but no true bog plants are found on them, though the soil is saturated with water and covered with a thick carpet of moss, principally *Hypnum* and *Racomitrium*—little *Sphagnum*. No plants are found on these areas that do not grow on the higher and drier ground, though *Empetrum nigrum* is in such places more abundant than elsewhere.

Special reference has been made to but a small part of the whole number of species on the islands, but those named give, it is hoped, a general idea of the nature of the vegetation. Many of the commoner species have not been mentioned and no grasses or carices have been referred to, but the relative abundance, and generally the habitat, of each species is given elsewhere.

GEOGRAPHICAL DISTRIBUTION OF THE PHAENOGAMS AND VASCULAR CRYPTOGRAMS KNOWN TO OCCUR ON THE PRIBILOF ISLANDS.

No part of this paper has been prepared more thoroughly and carefully than that showing the geographical distribution of the plants found on the Pribilof Islands. Some of the plants may have a wider range than I have indicated, but I have in all cases good authority for the occurrence of species in the districts I have referred them to. The authorities consulted will be found at the end of the list itself. This part of my paper was written in conjunction with Mr. Theodor Holm. Mr. Holm has collected from Greenland eastward to Nova Zembla, I from Labrador and Hudson Bay westward to Bering Straits and Kamchatka.

As will be seen from the list itself, the great majority of the plants found on the Pribilof Islands are circumpolar in their range, and in this respect the flora of the Pribilof Islands affords a marked contrast to that of the Commander Islands, in nearly the same latitude, on the west side of Bering Sea. Many of the species are the same on both groups of islands, but on the Commander Islands the number of species that are essentially Asiatic far exceeds the number of those on the Pribilof Islands that are distinctly American.

ANNOTATED LIST OF SPECIES.

PHAENOGAMS.

1. *Anemone richardsoni*, Hook.

Very abundant among moss and grass. Flowering in June and difficult to discover later in the season. Specimens collected with underground stems from 2 to 3 feet long.

2. *Ranunculus trichophyllus*, Chaix.

Found in only one locality on St. Paul Island—a small lake near the village. The water in this lake varies in depth in different years, and three forms have been collected there—the typical, the subterrèstrial (var. *caespitosus*), and “the dwarf form with capillary, flabby leaves” (var. *confervoides*).

3. *Ranunculus hyperboreus*, Rottb.

Common by lakes and on mud flats on both islands. Generally associated with *Montia fontana*.

4. *Ranunculus pygmaeus*, Wahl.

St. Paul Island. Collected only by Mr. William Palmer.

5. *Ranunculus reptans*, L.

Common by ponds and lakes on both islands.

6. *Ranunculus pallasii*, Schl.

Growing in *Sphagnum* by a small pond on St. George Island.

7. *Ranunculus altaicus*, Laxm.

Common in upland meadows on both islands. The specimens from these islands have been generally referred to *R. nivalis*, but in the writer's opinion are not that species.

8. *Ranunculus eschscholtzii*, Schl.

Not rare on St. Paul Island on grassy banks where the snow lies late in the spring.

9. *Coptis trifolia*, Salisb.

Two specimens of this species were found in 1896 on a grassy bank near the south end of St. Paul Island.

10. *Aconitum delphinifolium*, DC.

From 3 or 4 inches high on bleak uplands to 2 feet high among grass near the sea level. Common on both islands.

11. *Papaver radicum*, Rottb.

P. nudicaule, L. var. *arcticum*, Elkan.

Common on both islands. The flowers of this poppy are on the Pribilof Islands larger and more showy than I have seen them elsewhere. Murbeck has shown (fide Botaniske Litteraturblade, No. 13, p. 208) that the arctic poppy so generally referred to *P. nudicaule* is not that species.

12. *Papaver macounii*, Greene, Pittonia, Vol. III, p. 247. (Plate LXXXVIII.)

Perennial, scapose, the very stout scapes often a foot high in fruit, three or four times surpassing the tuft of leaves, hirsute hispid; leaves, even the petioles, comparatively devoid of hairiness, sometimes wholly glabrous; leaf outline ovate rather than obovate, the pinnae oblong lanceolate to almost linear; petals 4 (rarely 5), round

obovate, erodentate, often $1\frac{1}{2}$ inches long, yellow, fading greenish; pods 1 inch long, narrow, clavate oblong, 4 to 5 angled, hispid except on the prominent angles or ribs.

Easily distinct from all other boreal poppies by its narrow capsules, which are almost acute by the ascending position of the 4 or 5 rays of the stigma, thus approximating the scarcely tenable genus *Meconopsis*.

This beautiful poppy flowers about two weeks later than *P. radicum*. It was while collecting the latter species in 1897 that the author's attention was attracted by the leaves of *P. macounii*, which differ in color as well as shape, etc., from those of *P. radicum*. Visiting the same spot later, *P. radicum* was found with ripened seeds, while *P. macounii* was only in flower. It was found in abundance later in the season on other parts of St. Paul Island.

13. *Corydalis pauciflora*, Pers.

Not uncommon on St. Paul Island, generally in moss. Flowering early it is soon hidden by grass and the foliage of other plants.

14. *Nasturtium palustre* DC.

Among Mr. Palmer's plants from St. Paul Island were specimens of this species. After carefully looking for it in all localities where it was likely to grow but without discovering it, I am forced to the conclusion that Mr. Palmer's specimens were collected elsewhere. As I may be mistaken in this, however, I include it in the list.

15. *Draba hirta*, L.

Draba incana, Merriam's List.

Common on the edges of cliffs and on sandy slopes, St. Paul Island.

16. *Draba wahlenbergii*, Hartm.

Rare on exposed hilltops on St. Paul Island.

17. *Nesodraba grandis*, Greene, Pittonia, Vol. III, p. 253. (Plate LXXXIX.)

Draba grandis, Langsdorff.

Peduncles about twice the length of the central tuft of leaves and 5 to 10 inches high; pods nearly 3 lines broad and from orbicular to oval, on ascending pedicels of one-half to three-fourths inch long.

Common on dampish rocks and cliffs on both islands.

This is without doubt *Cochlearia spathulata* DC., collected on St. George and St. Paul islands by Chamisso and Eschscholtz. Fruiting specimens are in general appearance much more like a *Cochlearia* than a *Draba*.

18. *Eutrema edwardsii*, R. Br.

Not rare on uplands; generally growing among moss

19. *Cochlearia officinalis*, L.

Common on both islands.

20. *Cardamine bellidifolia*, L.

Rare on the most exposed parts of the interior of both islands.

21. *Cardamine pratensis*, L.

Common by ponds on both islands.

22. *Cardamine umbellata*, Greene, Pittonia, Vol. III, p. 154. (Plate XC.)

Stems several, 10 to 20 inches high from slender horizontal rootstocks, erect, sparingly leafy to the summit, the herbage glabrous; all the leaves pinnate, the lowest

with from 3 to 5 rounded or oval, the upper with 5 or 7 more elongated, leaflets, these all entire or very sparingly toothed; flowers few, small, white, often 3 to 5 only and from corymbose to subumbellate; stamens 6; pods erect (on pedicels of about one-half inch), about three-fourths line wide, three-fourths to 1 inch long including the prominent beak; valves not elastic; seeds about 8 or 9 under each valve, rather large.

Species somewhat nearly allied to the Californian *C. Breweri*.

Very common in damp places on both islands. Collected in a great variety of forms, according to habitat, but all answering well to Dr. Greene's description.

23. *Cardamine hirsuta*, L.

A small perennial plant much resembling the European *C. intermedia* has been referred here. It is rare on St. Paul Island.

24. *Arabis ambigua*, DC.

Not rare on gravelly, rocky, and sandy banks, St. Paul Island.

25. *Viola langsdoerffii*, Fisch.

Common on hillsides and in depressions on both islands.

26. *Viola palustris*, L.

Rare on damp banks on St. Paul Island.

27. *Silene acaulis*, L.

Common on exposed hillsides on both islands.

28. *Lychnis apetala*, L., var. *glabra*, Regel.

Common on uplands on St. Paul Island. The St. Paul Island plants are widely different from typical *L. apetala* and probably constitute a good species.

29. *Arenaria macrocarpa*, Pursh.

Forming large cushions on the uplands on both islands.

30. *Arenaria arctica*, Stev.

With the last on St. Paul Island, but much more common.

31. *Arenaria peploides*, L.

Common on both islands.

32. *Stellaria media*, Smith.

Common on low grounds near the villages on both islands.

33. *Stellaria borealis*, Bigel.

S. crassifolia, Merriam's List.

Rather rare on St. Paul Island.

34. *Stellaria borealis*, Bigel, var. *corallina*, Fenzl.

Damp places on St. Paul Island. Common.

35. *Stellaria calycantha*, Bong.

Rather rare on St. Paul Island.

36. *Stellaria longipes*, Goldie, var. *laeta*, T. and G.

A few immature specimens of what I believe to be this variety were collected on St. Paul Island in 1891. Dr. B. L. Robinson, however, thinks them a form of *S. ruscifolia*, Willd.

37. *Cerastium alpinum*, L.

Common on both islands. Very variable, according to habitat. *C. arvense*, included in Dr. Merriam's list on the authority of Dr. Vasey, could not be found in the United States National Herbarium at Washington and has been excluded. The specimens so named were probably a form of *C. alpinum*.

38. *Sagina linnaei*, Presl.

Common on earth and rocks on both islands.

39. *Sagina nivalis*, Fr.

Rare on St. Paul Island.

40. *Sagina* ———.

A few specimens of a minute caryophyllaceous plant were collected on St. George Island by Mr. Trevor Kincaid in 1897. Dr. Robinson, to whom the specimens were submitted, decided that it was different from any caryophyll known to him, but the material was too poor to base a new species upon. Though thought by Dr. Robinson to be an *Arenaria*, I agree with Mr. Holm, who also examined the specimens, that they should be referred to *Sagina*.

41. *Claytonia sarmentosa*, C. A. Meyer.

C. arctica, Merriam's List.

Common on both islands, generally with *Viola langsдорffi*.

42. *Montia fontana*, L.

Common on mud flats and damp rocks on both islands.

43. *Geranium erianthum*, DC.

On a grassy bank by a pond near the south end of St. Paul Island.

44. *Lupinus nootkatensis*, Don.

One of the most conspicuous and characteristic plants on the Pribilof Islands.

45. *Lathyrus maritimus*, Bigel. var. *aleuticus*, Greene.

On beaches and among sand dunes on both islands.

46. *Rubus chamaemorus*, L.

In boggy places on both islands.

47. *Rubus stellatus*, Smith.

Upland meadows and on sandy soil on both islands.

48. *Rubus arcticus*, L.

Not so common as the last, but not rare on either island. Specimens easily separable from either species were collected in 1897, but as they may possibly be the result of hybridization between *R. arcticus* and *R. stellatus* no attempt to describe them has been made.

49. *Geum rossii*, Seringe.

Hillsides and uplands on both islands.

50. *Sibbaldia procumbens*, L.

Rare on exposed banks and in the interior of St. Paul Island.

51. *Potentilla anserina*, L.

By ponds and marshes on both islands.

52. *Potentilla fragiformis*, Willd. f. *villosa*, Pall.
Common on rocky banks on both islands.
53. *Potentilla emarginata*, Pursh.
Exposed hillsides on both islands.
54. *Comarum palustre*, L.
Marshy places and by bogs and ponds on both islands.
55. *Saxifraga hieracifolia*, Waldst. Kit.
Not uncommon in damp mossy places on both islands.
56. *Saxifraga davurica*, L.
Rare on exposed slopes on both islands.
57. *Saxifraga stellaris*, L., var. *comosa*, Poir.
Rare on high interior of St. George Island.
58. *Saxifraga nelsoniana*, Don.

A common and variable Saxifrage, generally referred to *S. punctata*, L., is found on shores and islands throughout the Bering Sea region, but a comparison of this plant with Morrison's figure, to which Linnaeus refers, shows that it is not *S. punctata*.

59. *Saxifraga serpyllifolia*, Pursh.
S. chrysantha, Merriam's list.
Not rare on exposed parts of interior of St. Paul Island.
60. *Saxifraga bracteata*, Don.
Common on damp rocks on both islands.
61. *Saxifraga hirculus*, L.
In boggy places, St. Paul Island.

62. *Saxifraga hirculus*, L., var. *alpina*, Engler, Mon. Sax., p. 124.

Low, 2 or 3 inches high, densely caespitose, the leaves broader than in the type, subspatulate, petals larger, deep yellow. With *Chrysosplenium beringianum* on the more exposed hillsides in the interior and toward the northwest end of St. Paul Island.

63. *Chrysosplenium beringianum*, Rose, Bot. Gaz., Vol. XXIII, p. 275. (Plate CXI.)

"Rootstock 2.5 to 5 cm. long (?), creeping, sending off many long fibrous roots; radical leaves and stems several, spreading and forming a dense rosette; radical leaves small; petiole slender, 1.3 to 4.5 cm. long, broader at base, the margins (especially below) ciliate with long purplish hairs; blade reniform, 6 to 11 mm. broad, 4 to 5-crenate, crenations sometimes gland-tipped, thickish, pale, and glabrous below, dark green and glabrous or somewhat pilose above; stem 2.5 to 5 cm. high, naked or bearing a single leaf below the involucre; involucre leaves several, entire or 3-crenate, extending beyond the flowers; calyx 5 to 6 mm. broad, 4-lobed, purplish or becoming so; sepals very broad, nearly orbicular, rounded at apex; disk very prominent, strongly 8-lobed; fruiting calyx turbinate, 1 mm. high; capsule 2-horned, 6 to 10 seeded; seeds oblong, 0.5 mm. long, shining, delicately reticulated.

This species has been confused with *C. alternifolium*, from which it appears to be abundantly distinct. *C. alternifolium* differs in its habit in lacking the thickish rootstocks and possessing only slender stolons and filiform roots; in its larger, usually

much larger, leaves more numerous and generally double crenations, the smaller indentations containing a gland, or when simply crenate each crenation gland-tipped, thin, membranaceous in texture, (when dry) paler in color; petioles with margins usually glabrous but sometimes ciliate with a few white hairs.

Our form, which resembles *C. tetrandrum* in the size and shape of the leaves, has 8 stamens instead of 4, purple instead of greenish flowers, larger and definite seeds (6 to 10 instead of 30 to 50), stronger-lobed disk, and apparently differs also in its habit."

Abundant on disintegrated scoria in the interior of St. Paul Island.

64. *Chrysosplenium alternifolium*, L.

A few specimens were collected on St. George Island in 1897 by Mr. Trevor Kincaid.

65. *Parnassia kotzebuei*, Cham. and Schl.

Not rare on St. Paul Island.

66. *Hippuris vulgaris*, L.

Common on St. George Island, rarer on St. Paul Island.

67. *Epilobium clavatum*, Trelease.

Rather rare with *Gentiana tenella* on bare spots on low hills. The *E. anagallidifolium* of Dr. Merriam's list seems to be referable here.

68. *Epilobium behringianum*, Hausskn.

Not rare in damp, springy places on both islands.

69. *Epilobium spicatum*, Lam.

Not noted until 1897, when plants were found in several places on St. Paul Island. It is doubtful if it ever matures its seed there, as the only specimen seen in bloom was collected by Mr. Kincaid September 1, very soon after which date all plants are frozen.

70. *Ligusticum scoticum*, L.

Common in upland meadows and on hillsides on both islands.

71. *Selinum benthami*, Hook.

Common on both islands.

72. *Coeloplureum gmelini*, Ledeb.

Heracleum lanatum of Merriam's list.

Very abundant on both islands. The "poochka" of the natives on the Pribilof Islands, and eaten by them as *Heracleum lanatum* is eaten elsewhere.

73. *Cornus suecica*, L.

C. unalaskensis, Merriam's list.

Not rare on grassy and mossy slopes on either island.

74. *Galium trifidum*, L.

Wet banks of ponds on St. Paul Island.

75. *Valeriana capitata*, Pall.

Common in meadows and on damp, grassy slopes on both islands. *V. sylvatica*, recorded in Dr. Merriam's list as having been collected on St. Paul Island by Mr. Townsend, has been excluded.

76. *Aster sibiricus*, L.
Common in exposed places on St. Paul Island.
77. *Achillea millefolium*, L.
Common on both islands.
78. *Chrysanthemum arcticum*, L.
Low saline meadows and on damp uplands. Common on both islands.
79. *Artemisia globularia*, Cham.
Common on barren moors and hilltops on both islands.
80. *Artemisia novegica*, Fries, var. *pacifica*, Gray.
Common on both islands.
81. *Artemisia richardsoniana*, Bess.
Rare on St. Paul Island.
82. *Artemisia vulgaris*, L., var. *tillesii*, Ledeb.
Common on hillsides on both islands.
83. *Arnica unalaskensis*, Less.
A few plants in one locality near the south end of St. Paul Island.
84. *Petasites frigida*, Fries.
By all ponds and boggy places on both islands.
85. *Senecio pseudo-arnica*, Less.
Sandy shores and sand dunes on both islands.
86. *Taraxacum officinale*, Weber, var. *lividum*, Koch.
Common on grassy slopes and rocky banks on both islands.
87. *Campanula uniflora*, L.
Common among moss on the lower hills on St. Paul Island. *C. pilosa* of Merriam's list has been excluded, as no specimens could be found in the United States National Herbarium, and it has been reported by no one else.
88. *Campanula lasiocarpa*, Cham.
On grassy banks and uplands. Common on both islands and very variable. Small specimens collected in 1896 in general appearance are widely different from typical plants, but closer examination shows that except as to size they differ only in being less pilose on the calyx and less ciliate along the petioles.
89. *Pyrola minor*, L.
Rare on St. Paul Island.
90. *Armeria vulgaris*, Willd.
Common on both islands.
91. *Primula eximia*, Greene, Pittonia, Vol. III, p. 251. (Plate XCII.)
Rootstock simple; scape, 6 to 16 inches high, twice or thrice exceeding the foliage; spatulate-oblong or oblanceolate leaves thin, glabrous, entire or obscurely crenate or dentate; upper portion of the scape, and more particularly the pedicels, densely white-farinose; umbel few-flowered and somewhat one-sided, the flowers inclining one way; calyx cleft to the middle or a little more, the segments oblong-linear, scarcely acute;

corolla very large, rich black purple, its segments entire or somewhat erose, not emarginate. Usually referred to *P. nivalis*.

Very common on St. Paul Island, flowering a little later than *P. macounii*, but in bloom for a much longer period. Rarer on St. George.

92. *Primula macounii*, Greene, Pittonia, Vol. III, pp. 251 and 260. (Plate XCIII.)

Stouter than the last; the rootstock branched, and the scapes and leaf clusters thus tufted forming a mass; leaves obovate to oblanceolate, entire, glabrous, the inflorescence slightly glandular, but without a trace of farinose indument; umbels many-flowered and perfectly equilateral; calyx cleft well below the middle, its broad segments oval, or, if narrower, somewhat spatulate-oblong; corolla much as in the preceding, but of a lighter purple.

More nearly related to *P. parryi* than to *P. nivalis*. The foliage in this last is of much thinner texture, much more conspicuously veiny, even reticulately venulose, the reticulations showing central glandular dots. The dried leaf is so thin as to be perfectly translucent, and its margin is finely dentate, as Pallas's figure shows. But in *P. macounii* the leaves are thick, completely opaque when dry, scarcely veiny, not in the least reticulate or dotted; nor is there any trace of farinose indument.

Very abundant on St. George Island, flowering and maturing earlier than the last. In living plants the flowers are much lighter in color in *P. eximia* than in *P. macounii*, varying much, however, in dried specimens.

93. *Androsace villosa*, L.

Common on the slopes of the lower hills on both islands.

94. *Trientalis europaea*, L., var. *arctica*, Ledeb.

Never abundant, but found in many places on both islands.

95. *Gentiana tenella*, Rottb.

Rather rare on St. Paul Island. Found only on a few bare spots on low hills. Flowers ochroleucous or blue.

96. *Gentiana frigida*, Haenke.

Common on both islands.

97. *Gentiana glauca*, Pallas.

Rare on the most exposed places on both islands.

98. *Polemonium caeruleum*, L., var. *grandiflorum*, Ledeb.

Abundant on the slopes of the lower hills on both islands.

99. *Polemonium pulchellum*, Bunge, var. *macranthum*, Ledeb.

Often with the last, but also on the more exposed hillsides. White-flowered plants very common.

100. *Eritrichium chamissonis*, A. DC.

Common on St. Paul Island.

101. *Mertensia maritima*, Don.

Not rare along the seashore on both islands.

102. *Veronica serpyllifolia*, L.

Springy places, St. Paul Island.

103. *Veronica stelleri*, Pall.

Grassy banks by a pond near the south end of St. Paul Island.

104. *Pedicularis verticillata*, L.

Common on both islands.

105. *Pedicularis sudetica*, Willd.

Not rare about marshes on St. Paul Island.

106. *Pedicularis langsдорffi*, Fisch.

Hillsides and uplands on both islands.

107. *Pedicularis lanata*, Willd.

Common with the last on St. Paul Island.

108. *Euphrasia officinalis*, L.

One locality on St. Paul Island.

109. *Gynandra gmelini*, Cham. and Schl.

Rather rare on both islands.

110. *Gynandra stelleri*, Cham. and Schl.

Rare on St. Paul Island.

111. *Koenigia islandica*, L.

Rather rare on both islands

112. *Polygonum viviparum*, L.

Common on both islands.

113. *Polygonum macounii*, J. K. Small. (Plate XCIV.)

Perennial by a horizontal chaffy rootstock. Foliage bright green, glabrous or nearly so. Stems usually several together, 3 to 4 dm. tall, simple, leafy to the top; leaves basal and cauline; blades oblong, 5 to 12 cm. long, obtuse, more or less strongly revolute, sometimes minutely pubescent beneath, marginal nerves prominent; the basal and lower cauline leaves long petioled, the upper cauline short petioled or nearly sessile; ochreae very thin, 5 to 8 cm. long on the lower part of the stem, 1 to 4 cm. long on the upper parts; raceme 3 to 3.5 cm. long, short peduncled, the lower part producing numerous conic bulblets 5 to 6 mm. long, continuous; pedicels about 1 or 1.5 mm. long; ochreolae very thin, acute; perianth pink, 2 to 2.5 mm. long; segments oval or rhombic oval, obtuse; filaments strap shaped; ovary oval, 3-angled; styles 3-parted; achenes not seen. A remarkable species of *Polygonum*, in habit like a gigantic *P. viviparum*. Besides its much more robust habit, the compact raceme, with its large ochreolae and very small calices, serve as a ready means of distinguishing between the two species.

In boggy ground near a ditch on St. Paul Island.

Intermediate between *P. viviparum*, L., and *P. bistorta*, L.; perhaps a hybrid between these species or *P. viviparum* and *P. bistortoides*, Pursh, though differing widely from both and of much larger size than either. Mr. Holm's excellent drawing is of a small specimen; the average height is from 18 to 30 inches.

114. *Polygonum bistorta*, L.

By a little brook near Zapadni rookery, St. George Island. Specimens were not collected and, though recorded under the above name, the specimens seen were probably *P. bistortoides*, Pursh.

115. *Oxyria reniformis*, Hook.

Common in damp ravines or on damp spots on hillsides on both islands.

116. *Rumex acetosella*, L.

On sandy soil on St. Paul Island.

117. *Salix arctica*, Pall.

The common willow on both islands.

118. *Salix arctica*, Pall., var. *obcordata*, Anders.

Rarer than the last.

119. *Salix phylicoides*, Aud.

Collected on Bogoslov Hill by Dr. Merriam.

120. *Salix reticulata*, L.

Common on hillsides and uplands on both islands.

121. *Salix diplodictya*, Trautv.

Not rare on St. Paul Island. Determined by Mr. P. A. Rydberg.

122. *Salix ovalifolia*, Trautv.

Rare on St. Paul Island.

123. *Salix rotundata*, Rydberg MS.

A little willow, very abundant on a hillside near the village on St. Paul, has been collected there every year since 1891. Mr. M. S. Bebb determined specimens collected in 1891 and 1892, and wrote that he believed them to be intermediate between *S. rotundifolia* and *S. ovalifolia*. Mr. Theo. Holm, who examined specimens collected in 1897, considered them to be *Salix retusa*, L., forma, *rotundifolia*, Trautv., while Mr. P. A. Rydberg believes them to be new. Lundström, to whom specimens were sent, has at this writing not yet reported on them. This is, I believe, the same plant of which Mr. Bebb wrote Dr. Merriam "intermediate between *S. arctica* and *S. ovalifolia*—may possibly be a hybrid." I can not think it a hybrid. Distributed from the herbarium of the Geological Survey of Canada as No. 16645.

124. *Empetrum nigrum*, L.

Common on both islands.

125. *Streptopus amplexifolius*, DC.

In ravines on both islands.

126. *Fritillaria kamtschaticensis*, Ker.

In wet ground, generally by rivulets and brooks. Common on St. George Island; in one locality only (Tolstoi) on St. Paul Island.

127. *Lloydia serotina*, Reich.

Very abundant on parts of St. Paul Island, but flowering early and soon hidden by grass.

128. *Juncus balticus*, Deth., var. *haenkii* (Mey.), Fr. Buch.

Common in marshy places on both islands.

129. *Juncus biglumis*, L.

Not rare on either island.

130. *Luzula arcuata*, Hook., var. *unalaschkensis*, Fr. Buch.
Exposed hilltops on both islands.
131. *Luzula confusa*, Lindb., var. *latifolia*, Buch.
With the last, but also on lower levels on both islands.
132. *Luzula campestris*, Desv., var. *multiflora*, Celakovsky.
L. campestris, var. *sudetica*, Merriam's list.
Same distribution as the last, but not quite so abundant.
133. *Potamogeton filiformis*, Pers.
In a shallow pond on St. Paul Island.
134. *Eriophorum polystachyon*, L.
In boggy places on St. Paul Island.
135. *Eriophorum vaginatum*, L.
Bogs on St. George Island.
136. *Carex leiocarpa*, C. A. Meyer.
On boggy tundra on St. George Island. Not rare. On a grassy bank near a pond on St. Paul Island.
137. *Carex pyrenaica*, Meyer.
Young plants of what I believe to be this species were found growing with the last on St. Paul Island. My plants answer well enough to Meyer's description of *C. micropoda*, which, according to Boott, is identical with *C. pyrenaica*. Herb. No. 16611.
138. *Carex norvegica*, Schk.
Collected on St. Paul Island by Dr. Merriam.
139. *Carex lagopina*, Wahl.
Common on both islands. The var. *gracilescens* in bogs.
140. *Carex lagopina*, Wahl., var. *longisquama*, Geo. Kukenthal.
Spikes, 4 to 6, more elongate than in typical *C. lagopina*. Scales a little longer than the perigynia, broadly hyaline on the margins. Mossy uplands, St. Paul Island. Herb. No. 16620.
141. *Carex pribylovensis*, J. M. Macoun.
Culm, 30 to 40 cm. high; spikes, 3 to 4; ovate, roundish in a dense head; utriculus broadly ovate, very shortly beaked; scales broad and almost obtuse, a little shorter than the utriculi. Intermediate between *C. lagopina* and *C. glareosa*, to the latter of which species this plant has been referred by Professor Bailey. Herb. No. 16609.
142. *Carex gmelini*, Hook.
Common on both islands.
143. *Carex vulgaris*, Fries.
An almost typical form of this species is common on low flats where water lies late in the spring. Specimens nearly approaching the var. *turfosa*, Fries (Herb. No. 16612), were collected in a marsh on St. Paul Island. These have been identified as *C. vulgaris* var. *hyperborea* by Professor Bailey and *C. limula* by Mr. Kukenthal. The rhizome strong; scales black; perigynium nerveless; and in these respects they agree

with *C. limula*, Fries, but the leaves are narrower and the short-peduncled spikes erect.

144. *Carex salina*, Wahl.

This species, in one or other of its many forms, is common on both islands. The commonest of these is *C. salina*, subsp. *cuspidata*, Wahl., var. *haematolepis*, Drej., which grows everywhere on grassy uplands. The form *thulensis*. Th. Fries (Herb. No. 16618), was collected in a slightly saline marsh. With it grew the var. *subspatheacea*, Wormskj. (Herb. No. 16619). The varietal determinations given above were made by Mr. Kukenthal.

The *Carex rigida bigelovii* of Dr. Merriam's list I believe to be this species, though I have not seen his specimens.

145. *Carex cryptocarpa*, C. A. Meyer.

Common on both islands.

146. *Carex macrochaeta*, C. A. Meyer.

C. podocarpa, R. Br.

Common on both islands; the form *gracilior* found in one locality only.

147. *Carex macrochaeta*, C. A. Meyer, var. *subrigida*, Geo. Kukenthal.

Low, culm and leaves rather broad and very rigid, the leaves longer than the culm; the lowest spike female at the base; all the spikes longer and much narrower than in the type, club-shaped, rather loose flowered toward the base; scales hardly or not at all aristate. Herb. No. 16615.

Perhaps a hybrid between *C. macrochaeta* and *C. haematolepis*, though as these species belong to two different sections and there is little evidence of hybridization apart from the general appearance of the plant, I prefer to adopt the name given it by Mr. Kukenthal.

148. *Carex membranopacta*, Bailey, Bull. Torr. Bot. Club, Vol. XX, p. 428, 1893.

Very abundant in a large depression around a pond on St. Paul Island. This carex, at least where found by me, grows in clumps and is decumbent in habit, covering an area of from 24 to 30 inches in diameter. Dried specimens give no hint that the plant is not erect in habit; but the fact is that on St. Paul Island, at least, it lies flat on the ground, even when very young. At maturity the whole plant is frequently covered by the surrounding herbage. Herb. No. 16608, distributed as *C. compacta*, R. Br. The *C. saxatilis* of Dr. Merriam's list I take to be this species.

149. *Carex rariflora*, Smith.

Collected by Mr. Palmer on St. Paul Island.

150. *Hierochloa borealis*, R. and S.

Not rare on either island.

151. *Hierochloa pauciflora*, R. Br.

Rare on St. Paul Island.

152. *Alopecurus alpinus*, Smith.

Common on both islands.

153. *Alopecurus howellii*, Vasey, var. *merriami*, Beal.

On bare ground that has been used as hauling grounds by seals. Grows in dense clumps; decumbent in habit. Not seen elsewhere than on dry, bare ground.

154. *Phleum alpinum*, L.

Common on both islands.

155. *Phippsia algida*, R. Br.

Collected on St. Paul Island by Mr. Palmer in 1891, and a few specimens by myself on the same island in 1897.

156. *Arctogrostis latifolia*, Griseb.

Common on both islands.

157. *Arctogrostis latifolia*, Griseb., var.

Plants referred here were named *A. arundinacea* (Trin.) by Professor Scribner, but I can not agree with him that they are that species. In default of sufficient European material for comparison I prefer to leave my plant without a name for the present. Herb. No. 16632.

158. *Calamagrostis purpurascens*, Vasey.

Rare on St. Paul Island. Named *C. arctica* by Vasey in 1892.

159. *Calamagrostis deschampsoides*, Trin.

Very abundant where found, but local in its distribution.

160. *Deschampsia caespitosa*, Beauv., var. *arctica*, Vasey.

Very abundant on both islands.

161. *Trisetum subspicatum*, P. B.

Very abundant on both islands.

162. *Poa arctica*, R. Br.

Variable but common on both islands.

163. *Poa caesia*, Smith.

A form of this species was collected on St. George Island.

164. *Poa glumaris*, Trin.

Rare on St. Paul Island.

165. *Dupontia psilosantha*, Rupr.

Common in marshes on both islands.

166. *Arctophila effusa*, Lange.

Not rare on either island. The *A. fulva* of Dr. Merriam's list differs somewhat from other specimens collected on the Pribilof Islands, but seems to be this species.

167. *Glyceria angustata*, Fries.

Common on both islands, particularly in the vicinity of the seal rookeries and hauling grounds.

168. *Glyceria vilfoidea*, (Andn.) Fries.

Abundant on saline mud flats, but no flowering plants found. Not before known from Alaska.

169. *Festuca rubra*, L.

Common on both islands, but variable, the var. *barbata*, Hack., being very rare, and a form near *F. richardsoni* hardly less so.

170. *Festuca ovina*, L., var. *violacea* (Gaud.), Griseb.

Common on sandy soil on St. Paul Island.

171. *Elymus mollis*, Trin.

Very common on both islands.

172. *Elymus villosissimus*, Scribn.

Culms stout, 3 dm. high, from creeping root-stocks; leaves of sterile shoots narrow, as long as the culm; leaves of the culm comparatively short (6 to 13 cm.) and broad (6 to 10 mm.). Spikes ovate-oblong, 5 to 6 cm. long. Spikelets densely villous, 15 to 20 mm. long, 2 to 3 flowered. Empty glumes narrowly lanceolate, acuminate, 3-nerved, about as long as the florets, densely silky villous on the back. Third glume, 12 to 15 mm. high, 9-nerved, ovate-lanceolate, acute. Palea about as long as the glume, 2-toothed, hairy on the sides and back, ciliate on the keels, rachilla densely pubescent.

Common in depressions on grassy uplands. Growing with *Valeriana capitata*, *Viola langsdorffi*, *Rubus stellatus*, and such plants.

173. *Equisetum arvense*, L.

Common on both islands.

174. *Equisetum scirpoides*, Michx.

Common on both islands.

175. *Equisetum variegatum*, Schleich.

Abundant at the north end of St. Paul Island.

176. *Botrychium lunaria*, Swartz.

Rare among sand dunes on St. Paul Island.

177. *Phegopteris polypodioides*, Fée.

Collected on St. George Island by Messrs. True and Prentiss, and on St. Paul by Mr. Palmer.

178. *Asplenium filix-foemina*, Bernh.

Not rare in the interior of St. Paul Island.

179. *Aspidium spinulosum*, Swartz, var. *dilatatum*, Hook.

Common on both islands.

180. *Aspidium filix-mas*, Swartz.

Rare on St. George Island.

181. *Cystopteris fragilis*, Bernh.

Common on both islands.

Two ferns, *Polypodium vulgare*, L., and *Aspidium lonchitis*, Swartz, supposed to have been collected on the Pribilof Islands by Mr. C. H. Townsend, are included in Dr. Merriam's list, but as the specimens are not in the United States National Herbarium and no one else has collected these species on the Pribilof Islands, they have been excluded from this list. They are both common at Unalaska.

182. *Lycopodium selago*, L.

Common on both islands.

183. *Lycopodium alpinum*, L.

Rocky uplands on St. Paul Island.

184. *Lycopodium annotinum*, L., var. *pungens*, Spreng.

Barren uplands on St. Paul Island.

MUSCI.

Sphagnum fimbriatum Wils., var. *arcticum*, C. Jensen.

This variety and the form *fuscescens*, Warnst., recorded by Dr. Merriam. No locality. St. Paul Island. (J. M. Macoun.)

Sphagnum girgenшонii, Russ.

Boggy spots, St. George Island. (J. M. Macoun.)

Sphagnum lindbergii, Schpr., var. *microphyllum*, forma *brachydasyclada* Warnst.

Recorded by Dr. Merriam. No locality. St. Paul Island. (J. M. Macoun.)

Sphagnum riparium, Aongstr.

Bogs, St. George Island. (J. M. Macoun; Dr. Merriam.)

Sphagnum squarrosum, Pers., var. *imbricatum*, Schp.

Bogs, St. George Island. (J. M. Macoun.) Dr. Merriam records the form *brachyanoclada* Warnst. No locality.

Sphagnum squarrosum, Pers., var. *semi-squarrosum* Russ.

St. Paul Island. (J. M. Macoun.) St. George Island. (J. M. Macoun; Dr. Merriam.)

Dicranoweisia crispula, Lindb.

On rocks, St. Paul Island. (J. M. Macoun; Palmer.)

Oncophorus wahlenbergii, Brid.

On the ground, St. George Island. (Dr. Merriam; J. M. Macoun; Palmer.)

Dicranella rufescens, Schimp.

On earth, St. Paul Island. (J. M. Macoun.)

Dicranum molle, Wils.

Crevice of rocks, St. Paul Island. (J. M. Macoun.)

Dicranum strictum, Schleich.

St. Paul Island. (J. M. Macoun.)

Dicranum elongatum, Schleich.

St. Paul Island. (Dr. Merriam.)

Campylopus schimperi, Milde.

On rocks, St. Paul Island. (J. M. Macoun.)

Ceratodon purpureus, Brid.

On earth, St. Paul Island. (Dr. Merriam; J. M. Macoun; Palmer.)

Ceratodon heterophylla, Kindb. Ott. Nat., Vol. V, p. 179.

Agrees with *Ceratodon purpureus* in the shape of the capsule and the stem leaves, the not excurrent costa and the revolvable annulus, but the capsule is often more curved and distinctly strumose; agrees with *Ceratodon conicus* (Hampe.) in the peristomial teeth having few articulations; differs from both in the blunt perichetial leaves; is also very peculiar in the short, concave, suboval leaves of the long shoots.

Common on earth, St. Paul Island. (J. M. Macoun.) First collected in 1891.

Didymodon baden-powellii, Kindb. Ott. Nat., Vol. V, p. 179.

Differs from *Didymodon rubellus* in the dioecious inflorescence, the blunt, conic, very short lid, scarcely one-fifth of the capsule, and the distinctly dentate leaves (as in *Didymodon alpigenuus*, Vent.). The tufts are compact, about 2 cm. high, the leaves revolute nearly all around, short-acuminate, the lower pale brown, perichetial ones longer acuminate or subulate entire. The capsules are (unripe) more or less curved, the pedicel pale red.

St. Paul Island. (J. M. Macoun.) First collected in 1891

Desmatodon latifolius, Brid.

St. Paul Island. (Palmer.)

Desmatodon systilius, Br. and Sch.

St. Paul Island. (Dr. Merriam.)

I have seen neither Mr. Palmer's nor Dr. Merriam's specimens of *Desmatodon*, but believe them to be both *D. latifolius* which *D. systilius* nearly approaches. *D. latifolius* is common at Unalaska.

Grimmia apocarpa, Hedw.

On rocks, St. Paul Island. (J. M. Macoun.)

Racomitrium lanuginosum, Brid.

On rocks, St. Paul Island. (Dr. Merriam; Palmer; J. M. Macoun.)

Racomitrium microcarpum, Brid.

St. Paul Island. (Dr. Merriam.) Probably the next.

Racomitrium microcarpum, Brid., var. *palmeri*, Kindb.; Macoun, Cat. Can. Plants, Vol. VI, p. 267.

Differs in the leaves being long-subulate, hairless, the upper cells longer and more confluent, the alar ones large and rectangular, the capsule shorter pedicellate. Differs also from the related *Racomitrium sudeticum* in the deeply cleft peristomial teeth, the narrow leaf cells, etc. (Palmer; J. M. Macoun.) First collected by Mr. Palmer in 1890.

Orthotrichum laevigatum, Zelt.

Rocks, St. Paul Island. (Dr. Merriam; J. M. Macoun.)

Orthotrichum microplephare, Schimp.

St. Paul Island. (Dr. Merriam.)

Tetraplodon mnioides, Br. and Sch.

Wet banks, St. Paul Island. (Dr. Merriam; J. M. Macoun.)

Splachnum wormskioldii (Horne.), Kindb.

St. George Island. (J. M. Macoun.)

Bartramia ithyphylla, Brid.

Crevice of rocks, St. Paul Island. (Dr. Merriam; J. M. Macoun.)

Bartramia pomiformis, Hedw.

St. Paul Island. (Palmer.)

Philonotis fontana, Brid.

St. Paul Island. (Dr. Merriam; J. M. Macoun.)

Webera polymorpha, Schimp. var. *brachy carpa*, Kindb.

Crevices of damp rocks, St. George Island. (J. M. Macoun.)

Webera microcaulon, C. M. and Kindb.

St. George Island.

Webera nutans, Hedw.

On earth, St. Paul Island. (J. M. Macoun; Palmer.)

Webera cucullata, Schimp.

Crevices of rocks, St. Paul Island. (Dr. Merriam; J. M. Macoun.)

Webera canaliculata, C. M. and Kindb. var. *microcarpa*, Kindb.

Separated from the species only by its smaller capsule. St. Paul Island. (J. M. Macoun.)

Webera cruda, Schimp.

Crevices of rocks, St. Paul Island. (J. M. Macoun; Palmer.)

Webera albicans, Schimp.

On rocks, St. Paul Island. (J. M. Macoun.)

Bryum arcticum, Br. and Sch.

St. Paul Island. (Dr. Merriam.)

Bryum pendulum, Schimp.

On rocks, St. Paul Island. (Dr. Merriam; J. M. Macoun.)

Bryum inclinatum, Br. and Sch.

St. Paul Island. (Dr. Merriam.)

Bryum froudei, Kindb., Ott. Nat., Vol. V, p. 180.

Habit of *Webera nutans*. Agrees with *Bryum inclinatum* in the synoecious inflorescence and the symmetric capsule, etc.; differs in the leaves being long-acuminate, cells long and narrow, the upper sublinear (nearly as in *Webera*), costa very long-excurrent, peristomial segments quite free from the teeth, spores smaller, scarcely 0.02 mm.; the cilia are wanting.

Crevices of rocks, St. Paul Island. (J. M. Macoun.) First collected in 1891.

Bryum brachyneuron, Kindb., Ott. Nat., Vol. V, p. 180.

Agrees with *Byrum pendulum* in the synoecious inflorescence, the peristomes orange, the segments adhering to the teeth, the apiculate lid and the large spores (about 0.04 mm.); differs in the decurrent leaves, short-ovate, the costa broad, abbreviate, not excurrent, the sterile shoots bearing globose buds (gemmae), the very much broader peristomial teeth. Stem red, very short, the pedicel about 1 cm. long or shorter, often scarcely emerging above the tufts; costa of the lowest leaves red, percurrent only in the leaves of the shoots and the perichetial ones; capsule ventricose, short-necked constricted below the mouth. *Bryum fallax*, Milde., resembling it in habit, is dioecious; the segments are free, the spores smaller. *Bryum lacustre* differs in not having decurrent leaves, the capsule not being constricted below the mouth, the pedicel longer, the peristome pale, etc.

Crevices of rocks, St. Paul Island. (J. M. Macoun.) First collected in 1891.

Bryum argenteum, L.

Common on earth, St. Paul Island. (J. M. Macoun.)

Bryum obtusifolium, Lindb.

St. Paul Island. (Palmer.)

Bryum erythrophyllum, Kindb.

St. Paul Island. (Palmer.)

Mnium subglobosum, Br. and Sch.

St. Paul Island. (Dr. Merriam.)

Psilopilum arcticum, Brid.

Common on earth on St. Paul Island. (J. M. Macoun; Palmer.)

Pogonatum dentatum, Brid.

On earth, St. Paul Island. (J. M. Macoun.)

Pogonatum alpinum, Roehl.

On earth and rocks, St. Paul Island. (Dr. Merriam; Palmer; J. M. Macoun.)

Pogonatum alpinum, Roehl. var. *septentrionale*, Brid.

On rocks, St. Paul and St. George islands. (J. M. Macoun.)

Pogonatum alpinum, Roehl. var. *microdontium*, Kindb.

Separated from the species by its nearly entire or indistinctly denticulate leaves.
St. Paul Island. (Palmer; J. M. Macoun.)

Polytrichum strictum, Banks.

St. Paul Island. (Dr. Merriam.) Perhaps the next.

Polytrichum boreale, Kindb.

Differing from the nearly allied *P. hyperboreum* principally in the leaves being distinctly dentate above; the apex hyaline in the upper part, red in the lower.

St. Paul Island. (J. M. Macoun.)

Brachythecium albicans, Br. and Sch.

St. Paul Island. (Palmer.)

Brachythecium rivulare, Br. and Sch.

St. Paul Island. (Dr. Merriam.)

Eurhynchium vaucheri, (Schimp.).

On rocks, St. George Island. (J. M. Macoun.)

Plagiothecium pulchellum, Br. and Sch.

On other moss. St. Paul Island. (J. M. Macoun.)

Hypnum uncinatum, Hedw.

St. Paul Island. (J. M. Macoun.)

Calliergon cordifolium, Hedw.

St. Paul Island. (J. M. Macoun.)

Hylocomium splendens, Schimp.

St. Paul Island. (Dr. Merriam; Palmer.)

Hylocomium alaskanum, Schimp.

St. Paul Island. (J. M. Macoun.)

Hylocomium squarrosus, Schimp.

St. Paul Island. (Dr. Merriam; Palmer; J. M. Macoun.)

Hylocomium triquetrum, Schimp.

St. Paul Island. (Dr. Merriam; Palmer.)

HEPATICAE.

Diplophyllum taxifolium, Nees.

St. Paul Island. (Dr. Merriam; J. M. Macoun.)

Herberta adunca, S. F. Gray.

St. Paul Island. (Dr. Merriam.)

Gymnomitrium coralloides, Nees.

St. Paul Island. (Dr. Merriam; J. M. Macoun.)

LICHENS (COLLECTED BY J. M. MACOUN).

Ramalina cuspidata, (Ach.).

On rocks and earth, St. Paul Island. *Gracilis*; *altitudo* 4 to 7 cm.; *sporae*, 10 to 14 mik.

Ramalina polymorpha, Ach.

On rocks, St. Paul Island. *Neque haec neque praecedens kalio coloratur.*

Cetraria aculeata, (Schreb.), Fr.

On earth, St. Paul Island.

Cetraria arctica, (Hook.).

On earth, St. Paul Island.

Cetraria islandica, (L.) Ach.

Very common and variable on both islands; the forms *gracilis* and *robusta* growing with the type.

Cetraria islandica var. *delisoei*, (Bor.).

Common on St. Paul Island.

Cetraria cucullata, (Bell.), Ach.

On earth, St. Paul Island.

Cetraria nivalis, (L.), Ach.

On earth on both islands.

Cetraria fahlunensis, (L.), Schaer.

On rocks, St. Paul Island.

Cetraria lacunosa, Ach.

On rocks and earth on both islands.

Alectoria jubata, (L.), var. *chalybaeformis*, Ach.

On earth on rocks, St. Paul Island.

Alectoria divergens, Wahlenb.

Mixed with the last. *Medula chlorcalcio rubescit.*

Alectoria thulensis, Fr. Fries.

Common on earth on both islands.

Theloschistes lychneus, (Nyl.), var. *pygmaeus*, Fr.

Rare on rocks, St. Paul Island.

Parmelia saxatilis, (L.) Fr.

Common on rocks and earth on both islands; frequently found abnormally colored from red-brown to a beautiful violet. An isidiferous form on earth, St. George Island.

Parmelia saxatilis, (L.), Fr., var. *sulcata*, Nyl.

On rocks, St. George Island.

Parmelia physodes, Ach., var. *vittata*, Ach.

On earth, St. Paul Island.

Umbilicaria rugifera, Nyl.

On rocks on both islands, Nos. 27 and 28. *Chlorcalcio stratum corticale alterius speciminis rubescit, alterius non mutatur.*

Umbilicaria cylindrica, (L.), Delis., var. *delisoei*, Despa.

On rocks on both islands.

Umbilicaria erosa, Ach.

On rocks on both islands.

Umbilicaria proboscidea, (L.), Stenh.

On rocks on both islands.

Sticta linita, Ach.

On damp rocks, St. Paul Island.

Peltigera apthosa, (L.), Hoffm.

On and in wide crevices of damp rocks on both islands.

Peltigera canina, (L.), Hoffm.

On moss on both islands.

Peltigera canina, (L.), var. *spongiosa*, Tuck.

With the last, but not so common.

Peltigera canina, Hoffm., var. *spuria*, Ach.

In a dense tuft of moss which it divided, St. Paul Island.

Solorina crocea, (L.), Ach.

On earth and rocks, St. Paul Island,

Pannaria brunnea, (Sw.), Mass.

On earth and rocks, St. George Island.

Placodium elegans, (Link.), DC.

Rare on rocks, St. Paul Island.

Lecanora ventosa, (L.), Ach.

On rocks, St. George Island.

Lecanora tartarea, (L.), Ach.

Common and variable on rocks on both islands.

Lecanora tartarea, Ach., var. *frigida*, (Sw.).

Common on rocks, St. Paul Island.

Lecanora oculata, (Dicks.), Ach.

On rocks, St. Paul Island.

Lecanora oculata, (Dicks.), Ach., var. *gonatodes*, Ach.

On rocks, St. Paul Island. *Crusta Lecanora tartariae, kalio lutescit et chlorcalcio rubescit.*

Lecanora saxicola, Schaer.

Specimens which may prove to represent a new species have been provisionally referred here by Mr. Branth.

Pertusaria Sp. (?).

On rocks, St. George Island.

Pertusaria panygra (Ach.) Th. Fr.

On rocks, St. Paul Island. *Sporae solitariae* 160 to 190 mik. long., 30 to 60 mik. lat. (*Frustulum alterum ita alterum alia crusta.*) *Thallus e kalio fere immutatus.*

Stereocaulon coralloides, Fr.

On rocks, St. Paul Island.

Pilophorus robustus, Tuck.

Under overhanging rocks, St. Paul Island.

Cladonia alcicornis, Floerk.

Under damp overhanging rocks, St. Paul Island.

Cladonia decorticata, Floerk.

On earth and rocks, St. Paul Island.

Cladonia pyxidata, (L.), Fr.

On earth on both islands.

Cladonia degenerans, Tuck.

On earth, St. Paul Island.

Cladonia gracilis, (L.), Nyl. var. *elongata*, Fr.

Rare on St. Paul Island. The form *macroceras*, Tuck., is still rarer.

Cladonia furcata, Huds. var. *racemosa*, Fl.

On earth on both islands.

Cladonia furcata, Huds. var. *subulata*, Fl.

On earth on both islands.

Cladonia rangiferina, Hoffm.

Common on earth on both islands.

Cladonia rangiferina, Hoffm. var. *sylvatica*, L.

On earth, St. George Island.

Cladonia rangiferina, Hoffm. var. *alpestris*, L.

Common on earth on both islands.

Cladonia uncinialis, Fr. var. *turgescens*, Fr.

On earth, St. Paul Island.

Cladonia cornucopioides, (L.), Fr.

Common on earth on both islands.

Cladonia bellidiflora, (Ach.), Schaer.

Common on earth on both islands.

Sphaerophorum globiferum, DC.

On rocks on both islands. *Medulla I. coerulea* cit.

Sphaerophorum fragile, Pers.

On rocks, mixed with *Lecanora tartarea*.

Thamnomia vermicularis, Fr.

Common on earth on both islands. The form *gracilescens* is rare on earth on rocks, St. Paul Island.

Normandia laetevirens, Turn. and Borr.

Among tufts of moss, on St. George Island.

Heterothecium sanguinarium, (L.), Flot.

On rocks on both islands.

Lecidea sp. (?).

On rocks, St. George Island.

Lecidea sp. (?).

On rocks, St. George Island.

Buellia geographica, (L.), Tuck.

On rocks, St. George Island.

Buellia alpicola, Wahl.

On rocks, St. George Island.

Buellia sp. (?).

On rocks, St. George Island.

Verucaria sp. (?).

On rocks, St. George Island.

NOTE.—The chemical reactions, measurements of spores, etc., are by Mr. J. S. D. Branth, of Sneptrup, Denmark.

LICHENS COLLECTED ON ST. PAUL ISLAND IN 1891 BY WILLIAM PALMER AND DETERMINED BY MR. W. W. CALKINS.

Cladonia furcata, Fr.**Pycnothalia cladinoïdes**, Nyl.**Cladonia rangiferina**, Hoffm.**Cladonia papillaria**, Hoffm.**Theeloschistes lychneus**, Nyl.**Umbilicaria hyporea**, Hoffm.**Stereocaulon coralloïdes**, Fr.**Cladonia fimbriata**, Fr.**Lecanora thamnites**, Tuck.

FUNGI.

Clitocybe cyathiformis, Fr.

On earth, St. Paul Island.

Clitocybe diatreta, Fr.

On earth, St. Paul Island.

Clitocybe laccata, Scop.

On earth, St. Paul Island.

Russula nigrodisca, Pk. New species.

Pileus thin, convex or nearly plane, viscid when young and moist, black or blackish on the disk, purplish-red or dark-red on the even margin; lamellae thin, entire, subdistant, narrowed toward the stem, whitish; stem nearly equal, white or whitish; spores white, subglobose, 0.00035 to 0.00045 inch long; cystidia 0.002 to 0.0024 inch long, pointed at the apex.

Pileus 1 to 1.5 inches broad; stem 1 to 1.5 inches long, 2 to 4 lines thick.

On exposed hillsides among Cladonias and other lichens, St. Paul Island, September 18, 1896. (J. M. Macoun.)

This species is apparently related to *R. fallax*, from which it may be separated by its darker colored pileus with its even margin and by its larger spores. Its numerous conical-pointed cystidia project slightly from the edge of the lamellae. Having seen only dry specimens, it is impossible to say whether the flavor of the fresh plant is mild or acrid.

Flammula fulvella, Pk. New species.

Pileus thin, convex or nearly plane, glabrous, subtawny, the margin deflexed or incurved, flesh whitish; lamellae thin, subdistant, adnate or slightly decurrent, somewhat tawny, inclining to ochraceous-tawny; stem equal, solid, fibrillose or fibrillose-squamulose, colored like the pileus; spores elliptical, 0.0005 inch long, 0.003 broad.

Pileus 6 to 12 lines broad; stem about 1 inch long, 1.5 to 2 lines thick.

Low ground, St. Paul Island, September, 1896. (J. M. Macoun.)

Having seen dried specimens only, it is not possible to give the colors of the fresh plant nor of the young lamellae. The plants are apparently closely gregarious in mode of growth. It is possible that the pileus may be slightly viscid when fresh, but this could not be satisfactorily ascertained, and therefore the tribe to which the species belongs is uncertain.

Cortinarius?

On earth, St. Paul Island.

Nalaviea?

On earth, St. Paul Island.

Geographical distribution of the phaenogams and vascular cryptogams known to occur on the Pribilof Islands.

	Arctic America.	Northeast America.	Greenland.	Iceland.	Spitzbergen.	Scandinavia.	Arctic Russia.	Nova Zembla.	Arctic Siberia.	West coast of Bering Sea.	East coast of Bering Sea.
<i>Anemone richardsoni</i> , Hook		+	+								+
<i>Ranunculus tricophyllus</i> , Chaix	+	+	+	+			+				+
<i>Ranunculus pallasii</i> , Schl		+	+		+						+
<i>Ranunculus hyperboreus</i> , Rottb	+	+	+	+	+		+				+
<i>Ranunculus pygmaeus</i> , Wahl		+	+		+			+			+
<i>Ranunculus reptans</i> , L	+	+	+	+	+		+				+
<i>Ranunculus altaicus</i> , Laxm					+			+			+
<i>Ranunculus eschscholtzii</i> , Schl	+								+		+
<i>Coptis trifolia</i> , Salisb	+	+	+				+				+
<i>Aconitum delphinifolium</i> , DC											+
<i>Papaver radicatum</i> , Rottb	+	+	+	+	+		+	+	+		+
<i>Papaver macounii</i> , Greene											+
<i>Corydalis pauciflora</i> , Pers			+	+						+	+
<i>Nasturtium palustre</i> , DC		+	+	+			+				+
<i>Nesodraba grandis</i> , Greene										+	+
<i>Draba hirta</i> , L	+	+	+	+	+		+	+	+		+
<i>Draba wahlenbergii</i> , Hartm	+	+	+	+	+		+	+	+		+
<i>Eutrema edwardsii</i> , R. Br	+	+	+	+	+		+	+	+		+
<i>Cochlearia officinalis</i> , L	+	+	+	+	+		+	+	+		+
<i>Cardamine bellidifolia</i> , L	+	+	+	+	+		+	+	+		+
<i>Cardamine pratensis</i> , L	+	+	+	+	+		+	+	+		+
<i>Cardamine umbellata</i> , Greene											+
<i>Arabis ambigua</i> , DC											+
<i>Viola langsдорffii</i> , Fisch											+
<i>Silene acaulis</i> , L	+	+	+	+	+		+	+	+		+
<i>Lychnis apetala</i> , L	+	+	+	+	+		+	+	+		+
<i>Arenaria macrocarpa</i> , Pursh							+	+			+

Geographical distribution of the phaenogams and vascular cryptogams, etc.—Continued.

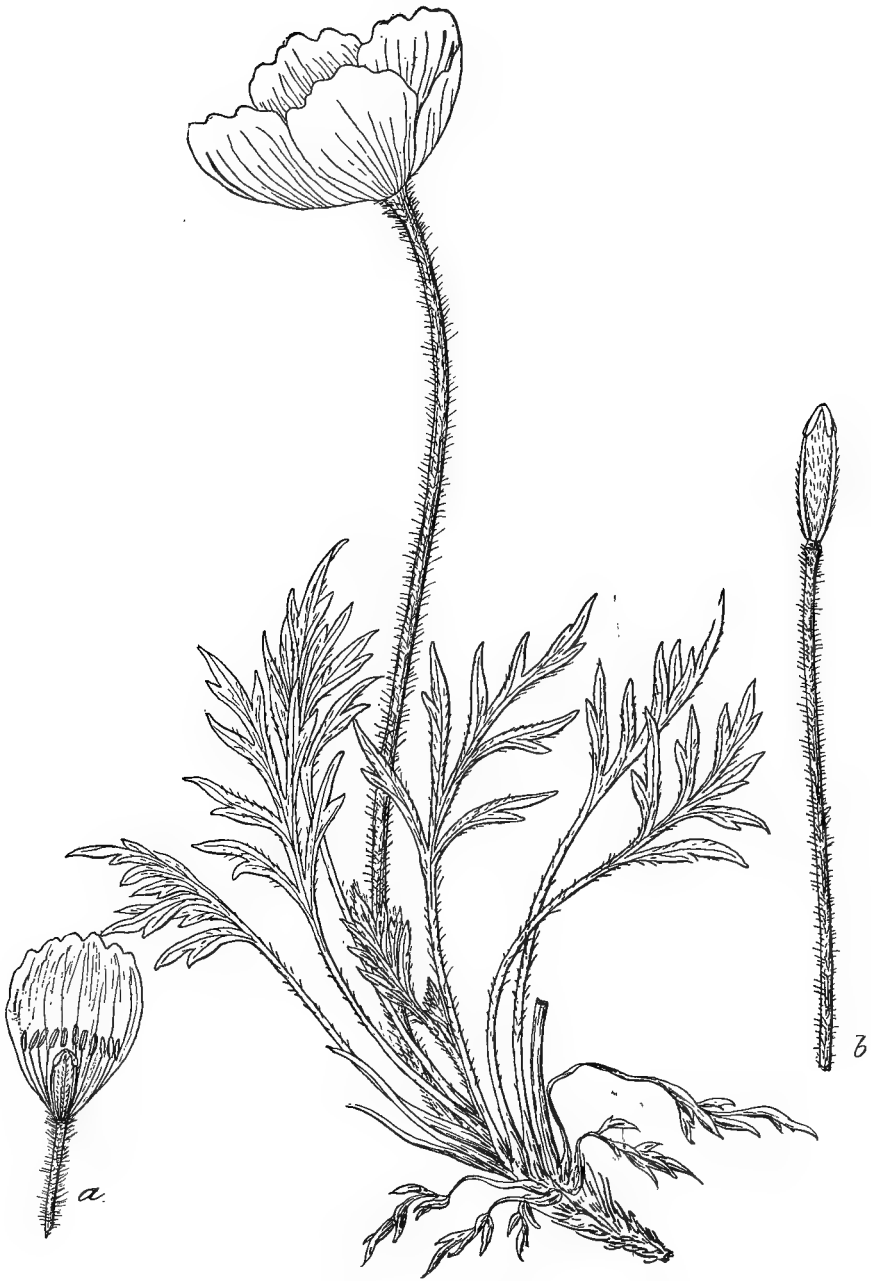
	Arctic America.	Northeast America.	Greenland.	Iceland.	Spitzbergen.	Scandinavia.	Arctic Russia.	Nova Zembla.	Arctic Siberia.	West coast of Bering Sea.	East coast of Bering Sea.
<i>Arenaria arctica</i> , Stev.....											
<i>Arenaria peploides</i> , L.....	+	+	+	+	+	+	+	+	+	+	+
<i>Stellaria media</i> , Smith.....				+							
<i>Stellaria borealis</i> , Bigel.....		+	+	+	+	+	+	+	+	+	+
<i>Stellaria humifusa</i> , Rothb.....	+	+	+								
<i>Stellaria longipes</i> , Goldie, var. <i>lacta</i> , Was.....	+	+	+								
<i>Cerastium alpinum</i> , L.....	+	+	+								
<i>Sagina linnaei</i> , Presl.....	+	+	+	+	+	+	+	+	+	+	+
<i>Sagina nivalis</i> , Fr.....	+		+	+	+	+	+	+	+	+	+
<i>Claytonia sarmentosa</i> , C. A. Meyer.....					+	+	+	+	+	+	+
<i>Montia fontana</i> , L.....		+					+			+	+
<i>Geranium erianthum</i> , DC.....										+	+
<i>Lupinus nootkatensis</i> , Don.....										+	+
<i>Lathyrus maritimus</i> , Bigel., var. <i>aleuticus</i> , Greene.....										+	+
<i>Rubus chamaemorus</i> , L.....	+	+	+			+	+	+	+	+	+
<i>Rubus stellatus</i> , Smith.....										+	+
<i>Rubus arcticus</i> , L.....	+	+	+			+	+			+	+
<i>Geum rossii</i> , Seringe.....						+	+			+	+
<i>Sibbaldia procumbens</i> , L.....			+	+			+			+	+
<i>Potentilla anserina</i> , L.....	+	+	+	+			+			+	+
<i>Comarum palustre</i> , L.....	+	+	+	+			+	+	+	+	+
<i>Potentilla fragiformis</i> , Willd. f. <i>villosa</i> , Pall.....					+		+			+	+
<i>Potentilla emarginata</i> , Pursh.....	+	+	+	+			+	+		+	+
<i>Saxifraga hieracifolia</i> Waldst. and Kit.....	+	+				+	+			+	+
<i>Saxifraga davurica</i> , L.....					+		+			+	+
<i>Saxifraga stellaris</i> , L. var. <i>comosa</i> , Poir.....	+		+		+	+	+	+	+	+	+
<i>Saxifraga nelsoniana</i> , Don.....										+	+
<i>Saxifraga serpyllifolia</i> , Pursh.....										+	+
<i>Saxifraga bracteata</i> , Don.....										+	+
<i>Saxifraga hirculus</i> , L.....	+	+				+	+			+	+
<i>Saxifraga hirculus</i> , L. var. <i>alpina</i> , Engl.....		+	+	+	+					+	+
<i>Chrysosplenium beringianum</i> , J. N. Rose.....					+					+	+
<i>Chrysosplenium alternifolium</i> , L.....	+	+			+	+	+	+	+	+	+
<i>Parnassia kotzebuei</i> , Cham. and Schl.....	+	+	+							+	+
<i>Hippuris vulgaris</i> , L.....	+	+	+	+		+	+			+	+
<i>Epilobium clavatum</i> , Trelease.....						+	+			+	+
<i>Epilobium behringianum</i> , Hausskn.....						+	+			+	+
<i>Epilobium spicatum</i> , Lam.....	+	+	+	+		+	+	+	+	+	+
<i>Ligusticum scoticum</i> , L.....			+	+		+	+			+	+
<i>Selinum Benthami</i> , Wat.....	+	+	+	+		+	+			+	+
<i>Coeloplureum gmelini</i> , Ledeb.....			+				+			+	+
<i>Cornus suecica</i> , L.....		+	+	+		+	+			+	+
<i>Galium trifidum</i> , L.....		+	+			+	+			+	+
<i>Valeriana capitata</i> , Pall.....	+						+	+	+	+	+
<i>Aster sibiricus</i> , L.....		+	+				+			+	+
<i>Achillea millefolium</i> , L.....	+	+	+			+				+	+
<i>Chrysanthemum arcticum</i> , L.....	+	+					+			+	+
<i>Artemisia globularia</i> , Cham.....										+	+
<i>Artemisia norvegica</i> , Fries var. <i>pacifica</i> , Gray.....										+	+
<i>Artemisia richardsoniana</i> , Hook.....										+	+
<i>Artemisia vulgaris</i> , L. var. <i>tillesii</i> , Ledeb.....							+			+	+
<i>Arnica unalaskensis</i> , Less.....										+	+
<i>Petasites frigida</i> , Fries.....	+				+	+		+	+	+	+
<i>Senecio pseudo-arnica</i> , Less.....		+								+	+
<i>Taraxacum officinale</i> , Weber var. <i>lividum</i> , Koch.....										+	+
<i>Campanula uniflora</i> , L.....	+	+	+		+	+				+	+
<i>Campanula lasiocarpa</i> , Cham.....										+	+
<i>Pyrola minor</i> , L.....	+	+	+	+	+	+	+	+	+	+	+
<i>Armeria vulgaris</i> , Willd.....	+	+					+			+	+
<i>Primula macounii</i> , Greene.....										+	+
<i>Primula eximia</i> , Greene.....										+	+
<i>Androsace villosa</i> , L.....										+	+
<i>Trientalis europaea</i> , L. var. <i>arctica</i> , Ledeb.....										+	+
<i>Gentiana tenella</i> , Rothb.....				+		+	+			+	+
<i>Gentiana frigida</i> , Haenke.....										+	+
<i>Gentiana glauca</i> , Pallas.....										+	+
<i>Polemonium caeruleum</i> , L. var. <i>grandiflorum</i> , Ledeb.....										+	+
<i>Polemonium pulchellum</i> , Bunge, var. <i>macranthum</i> , Ledeb.....										+	+
<i>Eritrichium chamissonis</i> , A. DC.....										+	+
<i>Mertensia maritima</i> , Don.....		+	+	+	+	+	+	+	+	+	+
<i>Veronica serpyllifolia</i> , L.....	+	+		+		+	+			+	+
<i>Veronica stelleri</i> , Pall.....										+	+
<i>Pedicularis verticillata</i> , L.....							+			+	+

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IN THE FOREGOING LIST.

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AN UPLAND MEADOW OF ST. PAUL.
From a photograph by J. M. Macconn.



PAPAVER MACOUNII Greene. Natural size.

a, The pistil, stamens, and a petal.

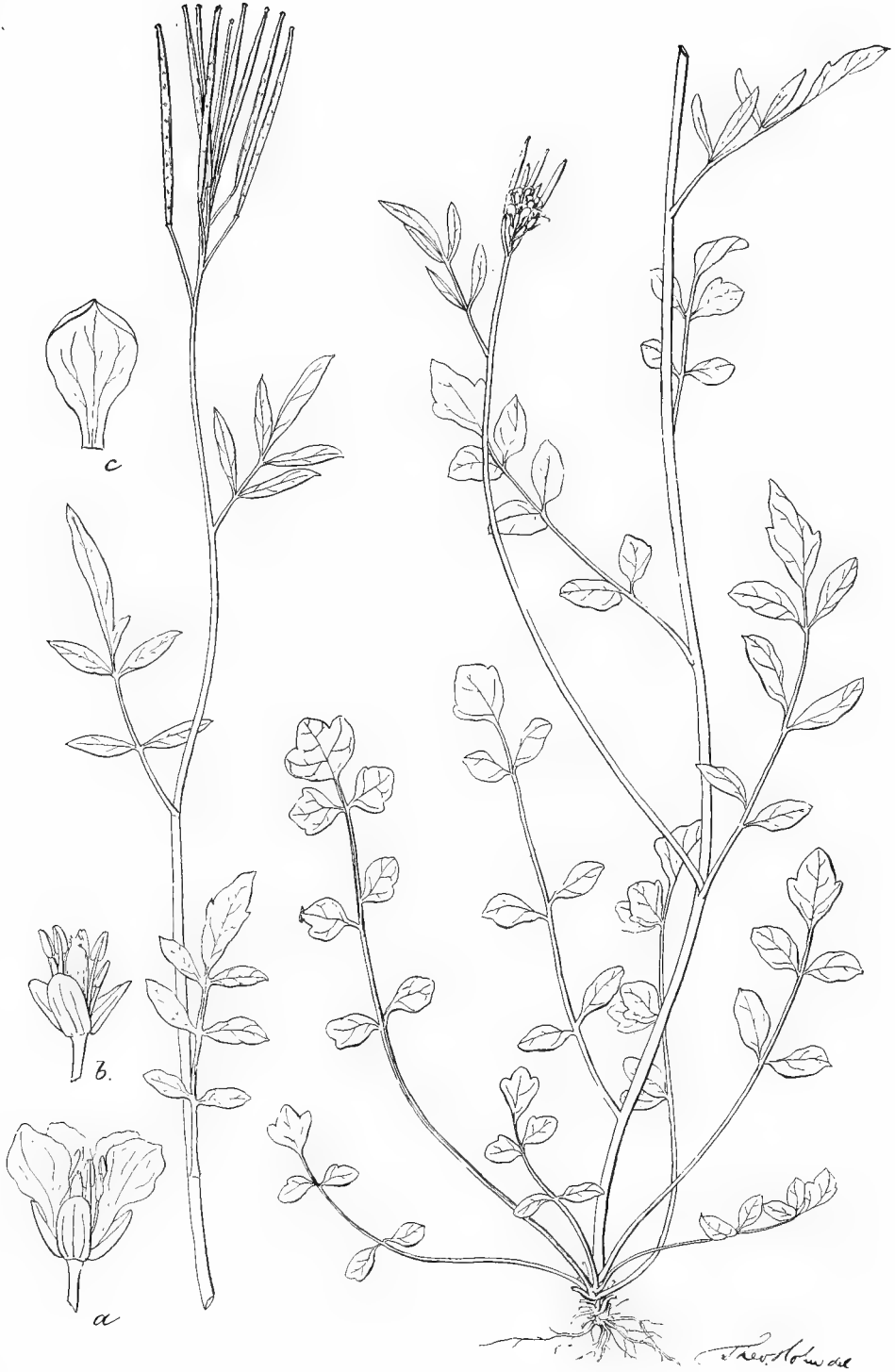
b, The fruit.

Drawn by Theo. Holm.

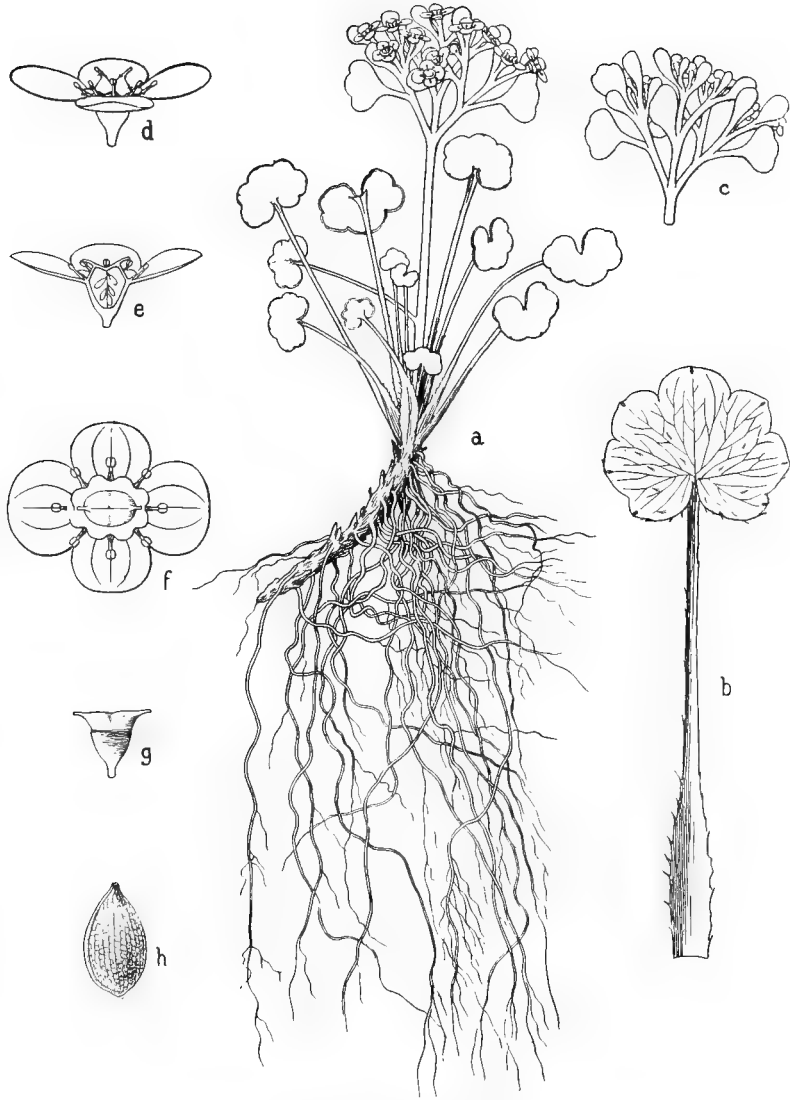


FRUITING SPECIMEN OF NESODRABA GRANDIS (Langsd.) Greene. Natural size.

Drawn by Theo. Holm.



CARDAMINE UMBELLATA Greene. Natural size.
a, Flower, magnified. b, Flower with petals removed, magnified. c, Petal, magnified.
Drawn by Theo. Holm.



CHRYSOSPENIUM BERINGIANUM Rose.

Fig. *a*, a plant, natural size; fig. *b*, leaf, enlarged 2 diameters; fig. *c*, enlarged 2 diameters; fig. *d*, flower; fig. *e*, section of the same; fig. *f*, the flower as seen from above; fig. *g*, ovary; *d*, *e*, *f*, and *g*, enlarged 5 diameters; fig. *h*, seed, enlarged 15 diameters.

Drawn by F. A. Walpole.



PRIMULA EXIMIA Greene. Plant natural size.

a, Flower laid open, magnified.

b, Fruiting scape, magnified.

c, Capsule, magnified.

Drawn by Theo. Holm.



PRIMULA MACOUNII Greene. Natural size.

a, Flowering specimen.

b, Fruit.

c, Vegetative shoot.

Drawn by Theo. Holm.



POLYGONUM MACOUNII Small.

Drawn by Theo. Holm.

