BOTANY OF YAKUTAT BAY, ALASKA.

1.—FIELD REPORT.

By Frederick Funston.

In accordance with my commission and letter of instructions to proceed to Yakutat Bay, Alaska, and make a collection of the plants of that vicinity, I took passage from San Francisco on the Coast Survey steamer *Hassler*, having purchased a camp outfit and hired a laborer to accompany me on the trip as cook and general camp employee. The *Hassler* sailed April 16, 1892, and on her way north touched at Port Townsend, Victoria, Departure Bay, Port Simpson, and Sitka, arriving at Yakutat Bay May 19, after a voyage of thirty-three days. On the night following our arrival there arose a heavy southeasterly wind, accompanied by rain, which continued with great violence for five days; so that it was not until May 25 that I was able to establish my camp on shore. In order to have some place suitable for storing supplies and caring for specimens, I rented from the natives a house situated in the smaller of their two villages, on Khantaak Island; the larger village being on the mainland, distant about a mile.

The Indians, of whom about two hundred live in the vicinity of Yakutat Bay, belong to the Thlinket tribe and are uncivilized, though apparently well disposed toward white people who come among them. They live in rude houses of their own construction, and subsist mostly on fish, both fresh and smoked, shellfish, crabs, and other marine animals, besides the flesh and oil of the hair seal. Seal oil seems to be their staff of life, as it is eaten with nearly all kinds of food, both animal and vegetable. During the summer season the Indians use large quantities of berries, and also utilize several edible plants, to be mentioned hereafter.

Immediately on establishing my camp I began the work of collecting, though at this season but few plants were in flower. I endeavored to obtain twenty sheets of dried specimens of each species, but in some cases only a partial series could be secured on account of the scarcity of the plant. The drying papers were changed two or three times every day and dried by hand over a fire before they were returned to the presses, this work being rendered necessary by the great humidity of the atmosphere and the almost daily rains. During the season about 10 cords of wood were used in keeping up these fires.

Yakutat Bay and the land in its immediate vicinity may be briefly described as follows: The bay, which lies approximately in latitude 60° N. and longitude 140° W., not only extends through the narrow strip of lowland separating the St. Elias range of mountains from the ocean, but also penetrates the range itself for a considerable distance. Its width at the entrance, between Ocean Cape on the east and Point Manby on the west, is about 20 miles, and its length, from the capes to the entrance of Disenchantment Bay, about 30 miles. The latter bay is merely an extension of Yakutat Bay, and lies wholly within the St. Elias range, being walled in by tremendous mountains rising from the water's edge. Its length is about 25 miles, and its width from 3 to 5 miles. Great glaciers composed of pure ice several hundred feet in thickness extend down to the water and throw off large numbers of icebergs, which crowd the waters of the bay at all times and are carried by the tides into Yakutat Bay, lining its western shore as far as Point Manby, the prevailing southeasterly winds holding them against this shore. The largest of the glaciers on Disenchantment Bay are the Hubbard and Dalton, the former having a frontage on the water of 6 miles and the latter of 2 miles, and each being about 15 miles long.

Beginning again at the entrance of Yakutat Bay, and following its eastern shore line from Ocean Cape to the foothills of the St. Elias range, a distance of about 20 miles, the surface of the country is generally level, though in some places there are hills 50 feet high. About 2 miles from Ocean Cape the Ankow River, a sluggish stream a hundred yards wide, empties into the bay. The Ankow has not been explored, but the Indians give its length as about 20 miles. As the country through which it flows has but little elevation above the sea, the waters of this river are extremely brackish as far as 7 miles from its mouth, being affected by the sea water at high tide. Between the mouth of the Ankow and the foothills of the mountains a number of small freshwater streams reach the waters of the bay. After the foothills of the range are reached the entire surface of the country undergoes a radical change, becoming extremely broken and mountainous, with numerous very rapid streams. In this region there is very little level land, the mountains generally rising from the beach to far above the line of perpetual snow. The most conspicuous peak in this locality is Mount Tebenkof, elevation unknown. Proceeding farther north, up the bay, the mountains become more precipitous and the snow line gradually comes nearer to sea level, until at the entrance to Disenchantment Bay the country has a decidely Arctic character. It is on this latter bay that the great glaciers appear, and in some sheltered canyons snow is found at sea level even in midsummer. Crossing the upper end of Yakutat Bay to the west side, near the mouth of Dalton Creek, the country is generally level, sloping gradually upward toward the mountains. In this vicinity a number of wide gravel washes, cut up by numerous small streams, come down from the neighboring mountains.

From the mouth of Dalton Creek to Point Manby, a distance of 30 miles, the narrow strip of land, less than a mile wide, lying between the beach and the edge of the Malaspina Glacier, is a succession of sand dunes near the beach and of gravel ridges near the glacier, with here and there small streams formed by the melting of the glacier ice.

On the eastern side of Yakutat Bay are about a dozen small islands, ranging in size from Khantaak, 7 miles long, to some less than an acre in extent.

During the first three weeks following my arrival, I collected on Khantaak Island and on the adjacent mainland from the Mission to Ocean Cape, and also took a canoe trip to Mr. McGrath's[1] camp, on the opposite side of the bay near Point Manby, a distance of 20 miles, but found little here that I had not already collected. Several days of the latter part of June were spent on a trip by sea to the base of Mount Tebenkof, a distance of 18 miles, but the weather was such that little was accomplished. A canoe trip to the mainland near Knight Island about the middle of July was more successful, though I was compelled by a heavy rain storm to return after a stay of one day. Several other journeys were made by canoe during the summer whenever the weather would permit, and nearly every accessible point on the shores of the bay was visited. It had been my original intention to spend the greater part of the summer at Dalton's cabin, an abandoned house in the forest, 3 miles from the beach on the west side of the bay near its head; but a dense ice pack which lay off this shore nearly all the summer precluded any attempt to effect a landing.

On August 2, accompanied by my laborer and another man employed to assist in handling the canoes in the ice, I left Khantaak Island with two canoes containing my camp outfit, collecting apparatus, and provisions for a two weeks' cruise, visiting nearly every part of Disenchantment Bay and climbing many of the mountains on its shores to the line of perpetual snow. The greater part of my collections in this region were made on the southern shore of the bay, near the large rock known as Haenke Island. Canoeing in Disenchantment Bay was attended with much labor and no little peril, as we were constantly in danger of being crushed in the floating ice which filled the bay at nearly all times.

On August 14, while camped on the east side of Disenchantment Bay near its entrance, I noticed that the ice floe off the mouth of Dalton Creek seemed to be less densely packed than usual, and, loading both canoes, I crossed to the opposite side and succeeded in landing, though one of the canoes was upset in the surf. Two days later I returned to Khantaak Island with my entire outfit. During this two weeks' trip the weather was exceptionally favorable and the collections were the most satisfactory made during the season. The rain poured in torrents nearly every day during the latter half of August, though some collecting was done in the intervals. The rainfall is said to have been

[1] Of the United States Coast and Geodetic Survey.

heavier in the summer of 1892 than in any other since the American occupation of Alaska. From my arrival at Yakutat Bay on May 19 until my departure on September 4, a period of 107 days, there were but 24 days wholly without rain.

The plant life of the region about Yakutat Bay is characterized by the dense and vigorous growth of a comparatively small number of species, giving the forests especially an appearance of great sameness.

The almost level country lying on the eastern side of the bay, between Ocean Cape and the foothills of the mountains, is covered with a forest growth practically impenetrable. The great amount of fallen timber, together with the tangled and heavy undergrowth, constitute such obstacles to travel that even the Indians, who have lived here many years, have never penetrated the forests of the mainland for a mile from their own village. The great bulk of this forest is composed of the Sitka spruce (*Picea sitchensis*), which in this region reaches a height of 70 feet. This tree extends from sea level to an altitude of 2,200 feet on the sides of Mount Tebenkof; but as one follows the coast line up the bay from this mountain, the upper limit becomes lower and lower, until at the entrance of Disenchantment Bay it reaches sea level, the tree not being found on the shores of this bay. A large forest lies along Dalton Creek, and there are several of considerable extent between this place and Point Manby.

The timber of the spruce tree plays a most important part in the economy of the natives, as from it are constructed their houses and canoes, and it is used in the manufacture of oil crates, bows, arrows, and other implements, while the smaller roots, after being boiled and split, are used in basket weaving.

The hemlock (*Tsuga mertensiana*) is found scattered through the spruce forests, and seems to have about the same vertical range as that tree, but is much less abundant and is somewhat smaller in size. The only other conifer found in this vicinity was a single individual of Sitka cypress (*Chamæcyparis nootkatensis*), a small tree on Khantaak Island near the Indian village.

The red alder (*Alnus rubra*) is found in great quantities throughout the forest region, especially on the edges of open glades, along the banks of streams, near the beach, and on the mountain sides, above the limit of spruce. On the western slope of Mount Tebenkof it reaches an altitude of 3,000 feet, 800 feet higher than spruce and hemlock, and grows on these higher slopes in such dense jungles as to be almost impenetrable, constituting one of the most serious obstacles to mountain climbing in this region. On the shores of Disenchantment Bay, where the spruce is not found, the alder reaches an altitude of 800 feet. This tree is also found in large quantities along the western shore of the bay.

A willow (*Salix barclayi*), growing from 5 to 10 feet high, is found sparingly on Khantaak Island and in the low forest region, and is abundant in the wide canyons and washes of the St. Elias range and

along the numerous small streams flowing from the Malaspina glacier, where it forms dense thickets which are the favorite resort of the ptarmigan.

The elder (*Sambucus racemosa*), an erect shrub about 8 feet in height, is common but not abundant in the open, well-drained tracts near the margin of the forest, more especially on Khantaak Island and near the mouth of the Ankow River. The bright, red berry ripens about the 1st of September, but as I left the country about this time I can not say whether the natives use this fruit or not.

Menziesia ferruginea, an erect shrub from 4 to 6 feet high, which flowers during the first half of June, is scattered through the denser forests. The highest altitude at which this plant was found was 1,800 feet above the sea on the sides of Mount Tebenkof, where, on June 22, the buds were not yet open.

The high-bush cranberry (*Viburnum pauciflorum*) is common in the forest region, growing more abundantly along the margins of the glades than in the dense woods. The blossoms are open in early June. The fruit—a bright scarlet berry about the size of a pea—is ripe after August 20 and is highly prized by the natives, who use large quantities in season but do not preserve it for winter consumption.

The blueberry (*Vaccinium ovalifolium*), a shrub 4 feet in height, forms a large part of the forest undergrowth in the low country, but is not found at any considerable altitude. The fruit, a dark purple berry larger than a pea, is collected in great quantities by the natives, who not only use it in season but preserve it for winter, drying the crushed berries by artificial heat. It is considered an important article of food, and in September, immediately after the close of the fishing season, nearly all the women and children of the village begin collecting and drying a supply for the coming winter.

Rubus spectabilis, known all along the northwest coast as the salmon berry, a spreading bush from 4 to 6 feet in height, grows in immense quantities in the less densely shaded forests and along the beach. It reaches an altitude of 2,200 feet on Mount Tebenkof. At this place, however, the growth is much stunted, as it is also on the sides of a mountain above the entrance of Disenchantment Bay at an altitude of 1,100 feet. The fruit, which in general shape resembles the red raspberry, is about an inch long by half an inch in diameter, and varies in color from very light to very dark red. It begins to ripen at sea level about August 5, and at higher altitudes two weeks later. During the season it is an important article of food among the natives, who gather large quantities in baskets. The berry is sometimes eaten as taken from the bush, but is usually crushed in a wooden bowl and eaten with seal oil. It is not preserved for winter use.

The devil's club (*Echinopanax horridum*), an erect shrub from 4 to 6 feet in height, with slender woody stem branching near the top, and densely covered with short, sharp prickles, is abundant in all the forests

of this vicinity, and on the mountain sides reaches an altitude of 1,800 feet. The dense and tangled growth of this plant, together with the fact that the points of the prickles break off immediately on penetrating the skin, make it an almost intolerable nuisance to one attempting to travel through the forest. It is found wherever the ground is shaded by forest growth, but does not thrive on the open, treeless sand beaches. Its large clusters of white, sweet-scented flowers are open in May and June, and the fruit, a red, nonedible berry, ripens about the last of August.

The black currant (*Ribes laxiflorum*), a thorny spreading bush 5 feet high, is abundant in the more densely shaded forests, especially on the slopes of the foothills, where it reaches an altitude of 1,900 feet, and in some places forms considerable thickets. A few stunted specimens were found at sea level on Disenchantment Bay. The berry, which is dark purple, almost black, ripens about August 10, and is not eaten.

Of the smaller plants found in the forest region, the most conspicuous, perhaps, not only on account of its showy white blossoms, but because of its great abundance, is *Cornus canadensis*, growing among mosses and on decaying tree trunks. The star-flower (*Trientalis europæa arctica*) is found on decaying logs in the forest, as is also *Coptis trifolia*. Other small plants found here and there in the forest region are *Tiarella trifoliata*, *Moneses uniflora*, *Pyrola secunda*, *Streptopus amplexifolius*, and *Lycopodium annotinum*. On the banks of small streams are found *Saxifraga punctata*, *S. stellaris*, *S. mertensiana*, *Mimulus langsdorfii*, *Heuchera glabra*, and *Claytonia sibirica*. The last-named plant is eaten both raw and cooked by the Indians. Of ferns, *Polypodium vulgare* is abundant in the low forest region, growing about the bases of tree trunks. *Dryopteris spinulosa*, which reaches a height of from 1 to 5 feet, grows in immense quantities in the damp woods, and was found at an altitude of 2,000 feet on the sides of Mount Tebenkof. *Phegopteris dryopteris* is also very abundant, and reaches an altitude of 1,100 feet on the mountain sides. During the season one specimen of *Dryopteris lonchitis* was found in the forest near Dalton Creek.

Scattered through the forests of the Yakutat Bay region are a number of small, open, treeless spots varying from a few square rods to an acre or two in extent. The larger of these glades are generally swampy, and in some of them water is standing all summer, while others are well drained, and there is no apparent reason for the lack of forest growth. These glades are few in number, and occupy in the aggregate an extremely small percentage of the total forest area. Owing to the fact that the sunlight has free access to them, these spots have a much heavier growth of the smaller plants than has the densely shaded forest. All these opens that are not too swampy have a heavy growth of grass, chiefly *Deschampsia cæspitosa*, though a few specimens of *Savastana odorata* were found in some of them as well as on the tops of sunny bluffs. *Fritillaria kamschatcensis* is found not only in the opens of the

lower forest, but at an altitude of 3,000 feet on Mount Tebenkof, where however the specimens were very much stunted. The flower is of a dark brown color, and has an extremely offensive odor. The bulbs are dried and eaten by the natives, but are not considered a staple article of food.

Heracleum lanatum, a plant from 3 to 5 feet in height, and of very rapid and vigorous growth, is common in the open places of the forest, and is also found at sea level on Disenchantment Bay. The leafstalks of this plant, which are about 2 feet long, are peeled and eaten raw by the natives, after the manner of celery.

Rubus pedatus, a plant not more than 4 inches in height, is common in many of the opens. Its small red berry has an excellent flavor and is eaten by the natives.

Among the other plants found in these glades are *Caltha palustris*, *Rubus stellatus*, *Viola langsdorfii*, *Actæa spicata arguta*, *Geum macrophyllum*, *Carex limosa stygia*, *Cœlopleurum gmelini*, *Erigeron salsuginosus*, *Tofieldia glutinosa*, *Iris setosa*, *Epilobium luteum*, *Polygonum viviparum*, *Ligusticum scothicum*, *Cicuta virosa*, *Aster foliaceus*, *Lathyrus palustris*, *Arnica latifolia*, *Epilobium palustre* (very rare), *Ranunculus reptans*, *Potentilla palustris*, *Habenaria dilatata*, *H. hyperborea*, *Eleocharis watsoni*, *Juncus falcatus alaskensis*, and *Equisetum variegatum*. *Menyanthes trifoliata* and *Nymphæa polysepala* grow in the shallow ponds that are found in some of these opens.

Stretching along the beach from Cape Phipps to the Ankow is a treeless strip of low sand dunes lying between high-tide mark and the margin of the forest, a distance of 100 yards. The area of this tract is about 10 acres. At the southeastern extremity of Khantaak Island is an equal area of the same nature, while the greater part of the land on the western side of the bay is of the same treeless, sandy character. The vegetation of these sand dunes is less dense and rank than that of the forest opens, though in some localities many acres are covered with a heavy growth of the strawberry (*Fragaria chiloensis*). On the grassy sand dunes that extend from the mouth of Dalton Creek to Point Manby and lie between the beach and the margin of the Malaspina glacier, this plant is found in immense quantities. On Khantaak Island and at Cape Phipps the fruit begins to ripen about July 1, and on the west side of the bay two weeks later. Strawberries were abundant at Dalton Creek as late as August 15. The fruit is about one-half inch long, somewhat pear-shaped, and of a light pink color. The berries have an excellent flavor, and are eaten in large quantities by the natives, who first cover them with seal oil, as they do all fruit. They are not preserved for winter use.

The coarse grass found along these sandy beaches is *Elymus arenarius*. The stems of this grass are cut while green by the Indians and dried over a fire, after which they are used in the manufacture of baskets, being woven into ornamental figures among the split spruce-roots of which the basket is made.

The other plants found on these sandy stretches are *Lathyrus maritimus*, which is very abundant; *Arabis hirsuta*, sometimes eaten raw by the Indians; *Arenaria lateriflora*, *Castilleja miniata*, *Ranunculus nelsoni*, *Lupinus nootkatensis unalaskensis*, *Epilobium latifolium*, *Pneumaria maritima*, *Phellopterus littoralis*, *Rhinanthus crista-galli*, *Achillea millefolium*, *Gentiana amarella*, *Selinum gmelini*, *Pedicularis palustris wlassowiana*, and *Juncoides campestre sudeticum*.

Along the gravel beaches just out of reach of high tide are found *Glaux maritima*, *Arenaria peploides*, *Puccinellia maritima*, and *Poa glumaris*.

The mountains of the St. Elias range in the Disenchantment Bay region, as has already been stated, are clothed to an altitude of about 800 feet with a dense growth of *Alnus rubra*. There are, however, in some localities extensive breaks in these thickets which are well filled with other vegetation, while there is a considerable variety of growth above the limit of this tree. A few of the plants in the vicinity of Disenchantment Bay have already been mentioned as occurring on Khantaak Island and on the mainland near the Mission, but the great majority of those collected in this region were not found in the low forest country. Beginning at about the upper limit of the red alder, the mountain sides are covered with a heavy growth of grass, *Deschampsia cæspitosa longiflora*, to an altitude of 2,550 feet. These grassy slopes are in many places given a decidedly bluish tinge by the blossoms of the monkshood (*Aconitum delphinifolium*). Above the grass limit the vegetation is more scattering, and consists mostly of *Salix arctica*, a willow about 3 inches in height; *Saxifraga bronchialis*, *Geranium erianthum*, *Cassiope stelleriana*, *Luetkea pectinata*, and *Bryanthus glanduliflorus*. The highest altitude which I reached on these mountains was 4,250 feet above the sea. At this height, at the time of my visit (the first two weeks of August), one reaches almost continuous snow fields, the mountains being unbroken white except where they are too steep for the snow to lie on, or where it has been swept away in an avalanche.

Among the plants collected in this treeless mountain region, besides those already mentioned, were *Tellima grandiflora*, *Arabis lyrata*, which is eaten raw by the natives; *Cerastium alpinum*, *Pyrola minor*, *Valeriana sitchensis*, *Potentilla procumbens*, *Parnassia fimbriata*, *Artemisia norvegica*, *Potentilla villosa*, *Barbarea barbarea*, *Ranunculus cooleyæ* (very rare), *Antennaria alpina*, *Campanula rotundifolia alaskana*, *Tussilago frigida*, *Antennaria margaritacea*, *Hieracium triste*, *Habenaria bracteata*, *Lycopodium alpinum*, *Anemone narcissiflora*, *Prenanthes alata*, *Aquilegia formosa*, *Arnica latifolia*, *Romanzoffia sitchensis*, *Euphrasia officinalis*, *Geum calthifolium*, *Cryptogramme acrostichoides*, *Cystopteris fragilis*, *Agrostis exarata*, *Phleum alpinum*, and *Poa alpina*.

As has been stated at the beginning of my report, but little collecting was done after my return to Khantaak Island from Disenchantment

Bay, on account of the weather, so that my work for the season was now practically closed.

The total number of specimens collected during the summer was about 3,000, representing 154 different species.

The work of the coast survey parties having been completed, the *Hassler* called in at Yakutat on September 3, and the next day started on her return to San Francisco. On account of a delay at Sitka and continued unfavorable weather, the vessel did not reach Port Townsend until October 3, 1892. As the time of the ship's departure for San Francisco from this port was uncertain, I left the vessel here and proceeded east.

In closing, I wish to acknowledge my indebtedness to Captain Harber and other officers of the *Hassler*, and to Messrs. McGrath and Turner, of the United States Coast and Geodetic Survey, all of whom took a lively interest in my work and aided me in many ways.

II.—BOTANICAL REPORT.

By FREDERICK VERNON COVILLE.

INTRODUCTORY NOTE.

The excellent collection of plants brought by Mr. Funston from the vicinity of Yakutat Bay, Alaska, in 1892, gives us our first comprehensive knowledge of the flora of that locality. The specimens collected undoubtedly represent nearly all the species of vascular plants that occur in the area traversed, but circumstances prevented, for the most part, the collection of the cellular cryptogams.

Yakutat Bay is an interesting point in the classification of the zonal plant areas of the Pacific Coast, for at this place the dense coastal forest characteristic of the coast mountains of British Columbia and southern Alaska is broken by the occurrence of a series of glaciers which here come down to the very beach, counteracting the influence of the warm ocean currents and driving the timber line backward into the sea. Westward from Yakutat Bay such breaks are frequent as far as Cooks Inlet and the eastern part of Kadiak Island.[1] West of these points the coniferous timber of the coast region ceases.[2]

On the west side of Yakutat Bay the Malaspina Glacier prevents the growth of trees except at a few sheltered points. The forest on the east side of Yakutat Bay, from Ocean Cape to Mount Tebenkof, a distance of about 30 kilometers, is described by Mr. Funston as dense and impenetrable and extending inland for an unknown distance. Of such a nature is the coastal forest which extends almost uninterruptedly to Sitka and still farther south.

The transition ground of such a change from forest to perpetual snow and ice is full of interest. One stretch of it lies on the eastern shore of Yakutat Bay, from Mount Tebenkof to the point which marks the entrance of Disenchantment Bay, on the east. Following up the eastern shore of Yakutat Bay over the lowlands, the forest meets Mount Tebenkof, the southernmost peak of this section of the St. Elias range, and ascends it to an altitude, on its western slope, of 2,200 feet. From this point the timber line dips abruptly downward along the coastward

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[1] "The eastern part of Kadiak Island and those lying to the northeast of it are abundantly supplied with spruce and other trees." Contributions to the Natural History of Alaska, 1886, p. 16; by L. M. Turner. Arctic Series of Publications, No. II, Signal Service, U. S. Army.

[2] See map in Alaska Coast Pilot, 1879, Appendix I, Meteorology and Bibliography; by W. H. Dall.

slope of the mountains until at the mouth of Disenchantment Bay, about 20 kilometers from Mount Tebenkof, it meets the sea.

The conditions which favor the northward progress of the forest are: The low elevation of the coast region, the warmth of the ocean currents, and the prevailing southeasterly winds; while the opposing conditions are: The higher elevation of the mountains, the snow and ice which cover them, and the occasional northerly winds.

Two zones are clearly represented in the flora of the Yakutat Bay region, one extending from the sea up to timber line, the other from timber line to the lower limit of perpetual snow. The conspicuous floral features of these zones are described by Mr. Funston in his field report. In its general geographic relationship the Yakutat Bay flora shows an almost exclusively circumpolar origin, while in its differentiation from the circumpolar flora it conforms with that of Western British America and the mountains of Washington and Oregon.

The appended catalogue of the collection contains 137 species and varieties of vascular plants and 27 of cellular plants. The determination of the specimens in certain cases has been made by students of special groups, the name of each of whom is inserted in the proper place in the catalogue.

CATALOGUE OF SPECIES.

RANUNCULACEÆ.

Anemone narcissiflora L. Sp. Pl. i, 542 (1753). Type localities, the Alps of Austria, Switzerland, and Siberia. The specific name, apparently by a slip of the pen, was printed first "*narcissifolia,*" but was corrected in a subsequent edition to *narcissiflora.*

Disenchantment Bay, August 13 (No. 114), nearly past flowering. The plant is abundant, ranging from 300 to 900 meters altitude.

Ranunculus cooleyæ Vasey & Rose, Contr. Nat. Herb. i, 289 (1893). The type specimens are those collected by Miss Cooley near Juneau, Alaska, and those of the present collection.

On the summit of a mountain on the mainland southeast of Haenke Island, Disenchantment Bay, August 10 (No. 99), at an altitude of 1,000 meters. Only four plants were seen. I am wholly unable to agree with Professor E. L. Greene[1] in considering this plant a close relative of *Kumlienia hystricula* (Gray) Greene, which is the *Ranunculus hystriculus* of Gray. In that peculiar plant the sepals are petaloid, being large and white like those of an Anemone, while the petals are reduced to minute stalked nectaries. In *Ranunculus cooleyæ* the sepals are of an herbaceous green color, while the petals have the large size, expanded form, and bright yellow color of an ordinary buttercup.

Ranunculus reptans L. Sp. Pl. i, 549 (1753); *R. flammula reptans* Meyer, Pl. Labr. 96 (1830). Described from specimens collected in Sweden and Russia.

Khantaak Island, July 31 (No. 81), along the margin of a fresh-water marsh.

Ranunculus nelsonii (DC.), Gray, Proc. Amer. Acad. viii, 374 (1873); *R. recurvatus nelsonii* DC. Syst. i, 290 (1818). The type specimens were collected on the island of Unalaska by David Nelson.

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[1] Erythea, ii, 193 (1894) and i, 53 (1895).

Knight Island, June 18 (No. 29), on a treeless, sandy bluff. It was common on Khantaak Island, and a few specimens were found on Mount Tebenkof at an altitude of 180 meters.

Caltha palustris L. Sp. Pl. i, 558 (1753). Type specimens from Europe.

On the east side of Yakutat Bay, near Ocean Cape, May 28 (No. 4); in the margins of fresh-water lagoons, but not abundant.

Coptis trifolia (L.) Salisb. Trans. Linn. Soc. viii, 305 (1807); *Helleborus trifolia* L. Sp. Pl. i, 558 (1753). Type localities, Canada and Siberia.

Khantaak Island, June 3 (No. 11); found sparingly among mosses and ferns in the lowlands.

Aquilegia formosa Fisch.; DC. Prodr. i, 50 (1753). Type locality, Kamchatka.

Disenchantment Bay, August 14 (No. 121); abundant up to an altitude of 200 meters.

Aconitum delphinifolium DC. Syst. i, 380 (1818). The type specimen was collected "in Hedge Island ad oras occidentales Americæ borealis" by David Nelson.

Disenchantment Bay, August 13 (No. 116); abundant on the grassy slopes of the mountains from 275 to 750 meters altitude.

Actæa spicata arguta (Nutt.) Torr. Pac. R. Rep. iv, 63 (1857); *A. arguta* Nutt.; Torr. & Gr. Fl. i, 35 (1838). The type locality is "woods of the Oregon [i. e., the Columbia] and its tributary streams."

Near the Mission, June 6 (No. 14); growing in treeless, sandy soil covered with grass.

NYMPHÆACEÆ.

Nymphæa polysepala (Engelm.) Greene, Bull. Torr. Club, xv, 84 (1888); *Nuphar polysepalum* Engelm, Trans. St. Louis Acad. ii, 282 (1865). Type locality, the higher Rocky Mountains, from the sources of the Platte to those of the Columbia. The various stations known at that time were also given.

Khantaak Island, June 26 (No. 43), in a fresh-water pond about 1 meter deep.

BRASSICACEÆ.

Barbarea barbarea (L.) MacMillan Met. Minn. Val. 259 (1892); *Erysimum barbarea* L. Sp. Pl. ii, 660 (1753); *Barbarea vulgaris* R. Br. in Ait. Hort. Kew. ed. 2, iv, 109 (1812). Type specimens from Europe.

Disenchantment Bay, August 8 (No. 95); growing in damp, shady spots from sea level to an altitude of 125 meters.

Arabis hirsuta (L.) Scop. Fl. Carn. ed. 2, ii, 30 (1772); *Turritis hirsuta* L. Sp. Pl. ii, 666 (1753). Original specimens, from Sweden, Germany, and England.

Khantaak Island, June 7 (No. 15); found abundantly about an old Indian camp. For use, see page 332.

Arabis lyrata L. Sp. Pl. ii, 665 (1753). Type specimen collected in Canada by Kalm.

Disenchantment Bay, August 3 (No. 84); common on rock slides and all places where other vegetation is scarce, at an altitude of 150 meters or less.

Cardamine oligosperma Nutt.; Torr. & Gr. Fl. i, 85 (1838). Type locality, "shady woods of the Oregon."

Khantaak Island, May 30 (No. 7); growing along the beach above tide water. Dr. N. L. Britton, to whom specimens have been submitted, refers them to *C. oligosperma*, yet doubtfully, for they have no mature fruit. He says that they are certainly not *C. hirsuta*.

Draba stenoloba Ledeb. Fl. Ross. i, 154 (1842). The type specimens were collected on the island of Unalaska by Chamisso and Eschscholtz.

Disenchantment Bay, August 9 (No. 96); on the sides of a rocky cliff, 90 meters above the sea. These specimens are in some cases annuals, in others biennials or

short-lived perennials, but they retain in the latter case a characteristic slenderness of the persistent part of the stem. Such specimens seldom occur in the Rocky Mountains and Sierra Nevada, but, according to Ledebour, a subperennial habit is characteristic of the species.

VIOLACEÆ.

Viola glabella Nutt.; Torr. & Gr. Fl. i, 142 (1838). Type locality, "shady woods of the Oregon," i. e., the Columbia River.

Near the entrance of Disenchantment Bay, July 24 (No. 74), on a mountain slope at the altitude of 125 meters.

Viola langsdorfii Fisch.; DC. Prodr. i, 296 (1824). Type locality, the island of Unalaska.

Khantaak Island, June 3 (No. 12) and June 27 (No. 48). No. 48 is a robust caulescent plant with flowers, when not shrunken, 18 to 25 mm. long. No. 12 has no well-developed aërial stems, and is a smaller plant than the other, with smaller flowers and more nearly glabrous petals. It blooms, Mr. Funston states, a month earlier than No. 48 and has flowers of a lighter blue. It will be seen that its characters incline toward those of *V. palustris*. No. 12 is abundant throughout the forest region, while No. 48 is said to occur less frequently.

CARYOPHYLLACEÆ.

Cerastium alpinum L. Sp. Pl. i, 438 (1753). Type specimens from Europe.

Disenchantment Bay, August 3 (No. 85) occurring but scantily.

Arenaria lateriflora L. Sp. Pl. i, 423 (1753). Type specimens from Siberia.

Khantaak Island, June 12 (Nos. 18 and 19). These specimens, like others from the northern portions of the range of the species, are of low stature, seldom exceeding 10 cm. in height, and have leaves about 1 cm. in length. In No. 19 the anthers are nearly black and contain a mass of bodies many times smaller than pollen grains, undoubtedly their atrophied and functionless representatives. The same tendency toward the suppression of the stamens is manifested in other herbarium specimens. The plant grew on a sand spit and along a sandy bluff.

Arenaria peploides L. Sp. Pl. i, 423 (1753). The Linnæan plants came from the seashores of northern Europe.

Khantaak Island, June 20 (No. 37). All the Alaskan specimens in the National Herbarium belong to the form described by Torrey and Gray as *Honckenya oblongifolia*. The plant is strictly a littoral species, growing in profusion along gravelly beaches between the line of high tide and the forest. It is very commonly used to produce a smudge to drive away insects.

PORTULACACEÆ.

Claytonia sibirica L. Sp. Pl. i, 204 (1753). Type locality, Siberia.

At the base of Mount Tebenkof, Yakutat Bay, June 22, (No. 42). The plant is abundant along the banks of streams flowing into Disenchantment Bay. For use see page 330.

GERANIACEÆ.

Geranium erianthum DC. Prodr. i, 641 (1824). The species was decribed from specimens collected by David Nelson in Kamchatka and northwestern North America.

Disenchantment Bay, August 10 (No. 100); common on the slopes of the mountains from 550 to 900 meters.

FABACEÆ.

Lupinus nootkatensis unalaskensis Wats. Proc. Amer. Acad. viii, 524 (1873). The type specimens of this variety were collected on the Island of Unalaska.

Khantaak Island, June 20 (No. 35). It was found in abundance also in Disenchantment Bay and on the west side of Yakutat Bay. The National Herbarium contains specimens not only from Unalaska but also from the Shumagin Islands and Kadiak Island.

Lathyrus maritimus (L.) Bigelow, Fl. Bost. ed. 2, 268 (1824); *Pisum maritimum* L. Sp. Pl. ii, 727 (1753). First described from European specimens.

At the mouth of the Ankow River, Yakutat Bay, June 13 (No. 20); abundant on a bare, sandy point.

Lathyrus palustris L. Sp. Pl. ii, 733 (1753). Type locality, Europe.

Khantaak Island, July 27 (No. 77), in the margins of forest openings.

ROSACEÆ.

Luetkea pectinata (Pursh) Kuntze, Rev. Gen. Pl. i, 217 (1891); *Saxifraga pectinata* Pursh, Fl. i, 312 (1814). Type specimen, from the "northwest coast" of North America, collected by Menzies.

Disenchantment Bay, August 5 (No. 90); abundant in the mountains, occurring between 180 and 1,200 meters altitude.

Rubus pedatus Smith, Ic. Pl. Ined. t. 63 (1791). "In Americæ borealis tractu occidentali legit Archibaldus Menzies."

Khantaak Island, June (No. 151); frequent in the moist spruce forests.

Rubus spectabilis Pursh, Fl. i, 348, t. 16 (1814). Pursh described the species from specimens collected by Lewis and Clarke on the banks of the Columbia River, and by Menzies "on the northwest coast."

At the Mission, May 26 (No. 1). For the distribution and uses of this plant, see page 329.

Rubus stellatus Smith, Ic. Pl. Ined. t. 64 (1791). Type locality the same as that of *Rubus pedatus*.

Near the Mission, June 1 (No. 9); common in the damp woods of the lowlands.

Geum calthifolium Smith, in Rees, Cycl. xvi (1819). Type specimen, collected "by Mr. Menzies on the west coast of North America."

Near Dalton Landing, August 16 (No. 130), occurring on a mountain side at an altitude of about 250 meters.

Geum macrophyllum Willd. Enum. i, 557 (1809). Type locality, "in Camtschatca."

Khantaak Island, June 17 (No. 25); a common weed near a deserted Indian village.

Fragaria chiloensis (L.) Lam. Encycl. ii, 537 (1786); *F. vesca chiloensis* L. Sp. Pl. i, 495 (1753). Type locality not given.

Khantaak Island, May 27 (No. 2). This plant has a thick, closely bracteate rootstock and thick, coriaceous leaves, glabrous and impressed-reticulate above, densely villous beneath, as in specimens from the vicinity of San Francisco. For the distribution and uses of this plant, see page 331.

Potentilla anserina L. Sp. Pl. i, 495 (1753). Type locality European.

Near the Mission, June 19 (No. 34). The plant is common but is confined to the beaches, both on the islands and on the mainland. The leaf of *Potentilla anserina* is one example of a type represented in the present collection by three other species, *Fragaria chiloensis*, *Potentilla villosa*, and *Phellopterus littoralis*. In all these plants the leaf is somewhat thickened, rugose and glabrous above, and beneath very densely tomentose or villous. All the species grow upon the naked, sandy beach of the ocean just above the line of high tide, where they are exposed not only to the

moisture-laden air of the region, but to the direct rays of the hot, summer sun, and, probably also, to the influence of the salt water in the soil. The similarity in the leaves of these plants, in the light of their diversity in natural relationship and their subjection to the same environment, is strong evidence of their adaptive modification for a common purpose.

Potentilla palustris (L.) Scop. Fl. Carn. ed. 2, i, 359 (1772); *Comarum palustre* L. Sp. Pl. i, 502 (1753). Type locality, European.

Along the Ankow River, about 10 kilometers from the point where it empties into Yakutat Bay, July 16 (No. 63); growing abundantly in fresh-water swamps near the stream.

Potentilla procumbens (L.) Clairv. Manuel, 166 (1811); *Sibbaldia procumbens* L. Sp. Pl. i, 284 (1753). Described from European specimens.

At Dalton Landing, August 15 (No. 124). The species was nearly past flowering.

Potentilla villosa Pall.; Pursh, Fl. i, 353 (1814). The type specimens, which Pursh saw in the herbarium of Lambert, came from the "northwest coast" of North America. In Ledebour's Flora Rossica the recorded American localities in which specimens were collected by Pallas are the islands of Kadiak and Unalaska.

Found only at a few points in Disenchantment Bay, August 8 (No. 94) and August 10 (No. 103), from sea level to an altitude of 650 meters. At this time the plant was nearly past flowering.

Sanguisorba latifolia nom. nov.; *Sanguisorba canadensis latifolia* Hook. Fl. Bor. Amer. i, 198 (1834); *Sanguisorba sitchensis* C. A. Meyer; Trautv. & Mey. Fl. Ochot. 35 (1856); *Poterium sitchense* Wats. Bibl. Ind. 303 (1878). The plant was described from specimens collected by Scouler at "Observatory Inlet, Northwest coast of America" and by Chamisso at Unalaska.

Along the Ankow River, about 10 kilometers above its mouth, July 16 (No. 66), on the edges of sandy bluffs along the river bank.

Sorbus occidentalis (Wats.) Greene, Fl. Fran. 54 (1891); *Pyrus occidentalis* Wats. Proc. Amer. Acad. xxiii, 263 (1888). The type specimens are from the higher mountains of Washington, Oregon, and California.

Disenchantment Bay, August 5 (No. 92). Only two specimens were seen, forming trees 2 to 3 meters high and growing at an altitude of 250 meters. The plant is referred to *S. occidentalis* with doubt; for while it has leaflets entire for their lower half, like those of that species, its young shoots are densely pubescent with brown hairs and the flowers are unusually large, the petals reaching a length of 5 to 6 mm., and the calyx-throat a breadth of 5 mm. The cymes are 3 to 5 cm. in diameter, and the leaflets nine to thirteen in number, the larger 5 cm. long. The plant is not referable to typical *S. sambucifolia*.

SAXIFRAGACEÆ.

Saxifraga bronchialis L. Sp. Pl. i, 400 (1753). Type locality, Siberia.

Disenchantment Bay, August 5 (No. 91); growing on the mountains at the altitude of from 575 to 1,150 meters. The leaves of this plant present the thick body and thin margins that occur also in *Bryanthus glanduliflorus*.

Saxifraga mertensiana Bong. Veg. Sitch. 141 (1831). Type locality Sitka.

At the base of Mount Tebenkof, June 22 (No. 41); abundant along the bank of a stream.

Saxifraga punctata L. Sp. Pl. i, 401 (1753). Type locality, Siberia.

At the base of Mount Tebenkof, June 22 (No. 40); growing with No. 41.

Saxifraga stellaris L. Sp. Pl. i, 400 (1753). Type locality European.

On the east side of Yakutat Bay, 25 kilometers north of the Mission, July 14 (No. 60); growing along a stream. The name *S. stellaris* is here used for this plant to emphasize the fact that, while commonly referred to *S. leucanthemifolia* of Michaux, now *S. michauxii* Britton, it does not really belong to that species. The type locality

of Michaux's plant is "in excelsis montibus Carolinæ," and it has not been found outside the Alleghany Mountains, although often collected there. European authorities have held that true *S. stellaris* has never been found in America, and that name is here adopted only for convenience.

Tiarella trifoliata L. Sp. Pl. i, 406 (1753). Type locality, northern Asia.
Khantaak Island, June 7 (No. 16), in the spruce forest.

Tellima grandiflora (Pursh) R. Br.; Richards. App. Frankl. Journ. 765 (1823); *Mitella grandiflora* Pursh, Fl. i, 314 (1814). Described from specimens collected on the northwest coast of North America by Menzies.

Disenchantment Bay, August 3 (No. 83); from sea level to an altitude of 150 meters.

Heuchera glabra Willd.; Roem. & Schult. Syst. vi, 216 (1820). Type specimen collected by Pallas in the western part of North America.

On the east shore of Yakutat Bay, 25 kilometers north of the Mission, July 14 (No. 59), along a forest stream.

Parnassia fimbriata Banks; Koenig and Sims, Ann. Bot. i, 391 (1805).

Disenchantment Bay, August 5 (No. 88); abundant on the mountain slopes from 180 to 675 meters of altitude.

Ribes laxiflorum Pursh, Fl. ii, 731 (1814). The original specimens were collected by Menzies "on the northwest coast."

On the east side of Yakutat Bay, near Ocean Cape, May 28 (No. 5).

The species occurs throughout the forest area in the vicinity of Yakutat Bay and is abundant on the foothills of the mountains. On Mount Tebenkof it extends to an altitude of 575 meters. The specimens are nearly past flowering. The use of the name *Ribes americanum* by Miller[1] for the plant commonly known as *R. floridum* prevents the use of Pallas's name *R. americanum*[2] for the present species.

ONAGRACEÆ.

Epilobium latifolium L. Sp. Pl. i, 347 (1753). Type specimen from Siberia.

On the west side of Yakutat Bay, about 7 miles north of Point Manby, June 28 (No. 49), and at Dalton Landing, August 15 (No. 128). The petals in these specimens sometimes attain the length of 2.8 cm. The petals, which are very beautiful and delicate, may be described as of a purplish, but pale, rose color. No. 128 is an albino. The species occurred abundantly on the west side of Yakutat Bay, between the beach and the moraine of the Malaspina Glacier; and along the base of Mount Tebenkof, occasionally rising to an altitude of nearly 500 meters.

Epilobium luteum Pursh, Fl. i, 259 (1814). Type specimen from the "northwest coast" of North America, collected by Pallas.

On the eastern side of Yakutat Bay, about 25 kilometers north of the Mission, July 14 (No. 58); growing along the beach just above the line of high tide. A few specimens were seen afterwards in the same situation in Disenchantment Bay.

Epilobium palustre L. Sp. Pl. i, 348 (1753). Type specimen from Europe.

Near the Mission, July 30 (No. 80); found in but one place. The filiform, subterranean offshoots characteristic of this species are excellently shown in some of the specimens. Like the similar slender organs of *Circæa alpina*, they are well adapted, in this exceedingly moist climate and in the moist, loose stratum of moss, leaves, or light soil through which they push their way, to propagate the plant without the loss of strength incident to a greater outlay of vegetative tissue. In a drier climate or a harder soil, much stouter and better protected structures, and consequently a greater expenditure of vital energy, would be required to accomplish the same result.

Circæa alpina L. Sp. Pl. i, 9 (1753). Type specimen from Europe.

At the mouth of Disenchantment Bay, July 24 (No. 76), among the rocks along the beach.

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[1] Gard. Dict. ed. 8 (1768).

[2] Pallas, Fl. Ross. ii, 34 (1784).

AMMIACEÆ.[1]

Cicuta virosa L. Sp. Pl. i, 255 (1753). Type specimen from Europe.
Khantaak Island, July 22 (No. 71); common in the edges of treeless openings.

Phellopterus littoralis Schmidt, Fl. Sachal. 138 (1868).
Along the Ankow near Ocean Cape, July 1 (No. 51). It occurred only among the sand dunes along the river and on the beach.
[Not before reported from Alaska. J. N. Rose.]

Ligusticum scothicum L. Sp. Pl. i, 250 (1753). Type localities, the seashores of England and Sweden.
Ocean Cape, July 18 (No. 70), on bluffs near the beach.

Selinum gmelini (Cham. & Schlecht.) Kurtz in Engler, Bot. Jarb. xix, 382 (1894); *Ligusticum gmelini* Cham. & Schlecht. Linnæa, i, 391 (1826); *Selinum benthami* Wats. Bibl. Ind. 432 (1878). Type specimens from Alaska.
Cape Phipps, July 23 (No. 73), on a sandy beach near the edge of the forest.

Cœlopleurum gmelini (DC.) Ledeb. Fl. Ross. ii, 361 (1844); *Archangelica gmelini* DC. Prodr. iv, 170 (1830). Type specimens from Kamchatka.
Khantaak Island, June 26 (No. 44); abundant in sunny spots about a deserted Indian village.

Heracleum lanatum Michx. Fl. i, 166 (1803). Type locality, Canada.
Khantaak Island, June 26 (No. 45); abundant on both the island and the mainland, growing along the margins of the forests and in their openings, and extending far up into Disenchantment Bay. For use as food, see page 331.

ARALIACEÆ.

Echinopanax horridum (Smith) Decaisne & Planch. Rev. Hort. 1854, 105 (1854); *Panax horridum* Smith, in Rees, Cycl. xxvi (1819). Type specimen collected by Menzies at Nootka Sound, Vancouver Island.
Khantaak Island, August 30 (No. 143), with mature fruit. The plant, which is popularly known as "devil's club," in May and June bears clusters of white, sweet-scented flowers. It is very common in the woods from sea level to an altitude of 550 meters, and its thick stems, from 0.5 to 2 meters high, covered with stout, spine-like prickles, often render one's progress difficult and painful. It occurs throughout the lowland forests in the vicinity of Yakutat Bay, following them to the altitude of 550 meters on Mount Tebenkof.

CORNACEÆ.

Cornus canadensis L. Sp. Pl. i, 118 (1753). Type locality, Canada.
Khantaak Island, June 15 (No. 23); abundant in the dense lowland woods at the base of Mount Tebenkof, ascending to an altitude of 100 meters. Mature fruit was collected August 27.

CAPRIFOLIACEÆ.

Sambucus racemosa L. Sp. Pl. i, 270 (1753). Type locality, Europe.
Khantaak Island, June 15 (No. 24). See page 329.

Viburnum pauciflorum Pylaie; Torr. and Gr. Fl. ii, 17 (1841). The type specimens were collected in Newfoundland by Pylaie.
Khantaak Island, June 15 (No. 22). Fruiting specimens were collected August 27. For notes on distribution and use, see page 329.

VALERIANACEÆ.

Valeriana sitchensis Bong. Veg. Sitch. 145 (1831). Type specimens from Sitka.
Disenchantment Bay, August 4 (No. 87); abundant on sandy slopes near the beach, and rising to an altitude of 180 meters.

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[1] The Ammiaceæ have been determined by Dr. J. N. Rose.

CARDUACEÆ.

Aster foliaceus Lindl.; DC. Prodr. v, 228 (1836). The type specimens were from Unalaska.

Khantaak Island, July 27 (No. 78), on a bluff along the western side of the island.

Erigeron salsuginosus (Richards.) Gray, Proc. Amer. Acad. xvi, 93 (1881); *Aster salsuginosus* Richards. App. Frankl. Journ. 748 (1823). Type locality, the Salt Plains in Athabasca.

Khantaak Island, June 27 (No. 46); common in openings in the forest.

Antennaria alpina (L.) Gaertn. Fruct. ii, 410 (1791); *Gnaphalium alpinum* L. Sp. Pl. ii, 856 (1753). Type specimens from the Alps of Lapland and Switzerland.

Disenchantment Bay, August 10 (No. 101); ranging from sea level to an altitude of 250 meters.

Antennaria margaritacea (L.) Hook. Fl. Bor. Amer. i, 329 (1834); *Gnaphalium margaritaceum* L. Sp. Pl. ii, 850 (1753); *Anaphalis margaritacea* Benth. & Hook. Gen. Pl. ii, 303 (1873). No more specific localities were assigned for the Linnæan specimens than North America and Kamchatka.

Along the banks of a river flowing into Disenchantment Bay, at a point southeast of Haenke Island, August 11 (No. 106), in sandy soil.

Achillea millefolium L. Sp. Pl. ii, 899 (1753). Type specimens from Europe.

At Ocean Cape, July 18 (No. 69), abundant on the sandy beach; at Point Manby and in Disenchantment Bay, both along the beach and on the hillsides to an altitude of 135 meters. The specimens belong to the boreal type of the plant, which has a darker-colored involucre than the weed of more southern range.

Artemisia norvegica pacifica Gray, Syn. Fl. i, pt. ii, 371 (1884). Range given as from the Arctic coast to the Aleutian Islands, etc. The name of this plant unquestionably must be changed.

Disenchantment Bay, August 8 (No. 93); abundant, occurring from sea level to an altitude of 200 meters. Some of the specimens are very large and robust, reaching 60 cm. in height, the petioles of the basal leaves sometimes 25 cm. long and their blades 13 cm. Its place of growth, on a grassy bank near the beach, undoubtedly accounts for this unusual development.

Arnica latifolia Bong. Veg. Sitch. 147 (1833). Type specimen collected at Sitka by Mertens.

Yakutat Bay, near the Mission, July 30 (No. 79), and at Dalton Landing (No. 122); in the former locality common in open swampy places in the forest, in the latter growing in abundance among the sand dunes along the beach.

Tussilago frigida L. Sp. Pl. ii, 865 (1753). Type locality European.

Disenchantment Bay, August (No. 105); growing in wet, sheltered spots from sea level to an altitude of 75 meters. Our specimens, as well as others from Alaska, do not conform with the typical plant of Europe. The flowering stems reach 40 cm. in height, and the petioles 25 cm.; while the leaf blades, which are usually more nearly reniform than deltoid, with sinuses reaching one-third or one-half the way to the base, attain a breadth of 15 cm. The ligules of the ray flowers are minute and inconspicuous in both kinds of anthodia.

Hieracium triste Willd.; Spreng. Syst. iii, 640 (1826). Type specimen from the Aleutian Islands.

Disenchantment Bay, August 12 (No. 107); at an altitude of 1,000 meters. It occurred sparingly on grassy slopes from this altitude down to sea level, at the lower points bearing mature fruit.

Prenanthes alata (Hook.) Gray, Syn. Fl. i, pt. ii, 435 (1884); *Nabalus alatus* Hook. Fl. Bor. Amer. i, 294, t. 102 (1834). Type locality, Fort Vancouver, Washington.

Disenchantment Bay, August 13 (No. 115); extending abundantly from an altitude of 650 meters down to 450 meters, and sparingly down to 150 meters.

CAMPANULACEÆ.

Campanula rotundifolia alaskana Gray, Syn. Fl. ii, pt. i, 395 (1886). The range given with the description is from the northern Aleutian Islands to Kadiak and Sitka.

Disenchantment Bay, July 10 (No. 56) and August 10 (No. 102); the latter nearly past flowering. The name here used can not properly be applied to this plant under the present principles of nomenclature, but an examination of type specimens is necessary to ascertain its proper designation. No. 56 was found on the side of a steep, rocky bluff, about 25 kilometers north of the Mission. Where No. 102 was collected the species occurred abundantly on the grassy mountain slopes at an altitude of 350 to 675 meters.

ERICACEÆ.

Vaccinium ovalifolium Smith in Rees, Cycl. xxxvi (1819). Type specimen, "brought by Mr. Menzies from the west coast of North America."

At the Mission, May 31 (No. 8). The plant at this date had nearly ceased blooming. Mature fruit was collected August 27. For notes on the distribution and uses of this plant, see page 329.

Cassiope stelleriana (Pall.) DC. Prodr. vii, 611 (1839); *Andromeda stelleriana* Pall. Fl. Ross. ii, 58 t. 74 f. 2 (1790).

Disenchantment Bay, August 12 (No. 110); occurring at an altitude of 300 to 1,000 meters. On the summits of the mountains it is often the only plant to be found. The thick leaves of this plant have thin edges, which character, as is suggested by their position in unfolding, may be due to the pressure of the parts in the bud.

Bryanthus glanduliflorus (Hook.) Gray, Proc. Amer. Acad. vii, 368 (1868); *Menziesia glanduliflorus* Hook. Fl. Bor. Amer. ii, 40, t. 132 (1834). Type specimens collected by Drummond in the alpine woods and mountains north of the Smoking River.

Disenchantment Bay, August 12 (No. 109); on the mountains at the altitude of from 350 to 1,000 meters. The leaves of these Alaskan specimens, which seem to be from the highest latitude in which the species has ever been found, are thinner and more serrate than in specimens from the southern portion of the range of the species. The densely glandular, hirsute corolla and calyx, the short-pilose but not glandular filaments, and the lemon-yellow color of the corolla, distinguish it from the related species. The serrations of the leaves are tipped when young with glands which, like those of the calyx and corolla, afford a resinous-glandular protective covering for the exposed nascent parts of the plant.

Menziesia ferruginea Smith, Ic. Ined. t. 56 (1791).

Khantaak Island, June 10 (No. 26); common in the lowland forests on the mainland and extending to 550 meters on Mount Tebenkof. The filaments in these specimens are conspicuously short-pilose near the base.

Pyrola minor L. Sp. Pl. i, 396 (1753). Type locality European.

Disenchantment Bay, August 14 (No. 86); found at only a single point, in the shade of a clump of alders near the beach.

Pyrola secunda L. Sp. Pl. i, 396 (1753). Type locality European.

On the eastern shore of Yakutat Bay about 30 kilometers north of the Mission, July 14 (No. 57). It was found, but not frequently, at several points in the forest area growing in the moist moss.

Moneses uniflora (L.) Gray, Man. 273 (1848); *Pyrola uniflora* L. Sp. Pl. i, 397. Type locality European.

Ocean Cape, July 9 (No. 54), growing in the moss of a dense forest, and in the mainland forest near Mount Tebenkof.

PRIMULACEÆ.

Trientalis europæa arctica (Fisch.) Ledeb. Fl. Ross. iii, 25 (1847); *T. arctica* Fisch.; Hook. Fl. Bor. Amer. i, 121 (1830). The range given with the original description is from Sandy Bay, in Clarence Straits, to Unalaska, and in Kamchatka.

Between the Mission and Cape Phipps, June 1 (No. 10); of frequent occurrence in the spruce forest.

Glaux maritima L. Sp. Pl. i, 207 (1753). Type locality Europe.

On the mainland near the Mission, June 19 (No. 32); growing in patches on the beach just above the line of high tide. It occurred also on Khantaak Island at the head of Port Mulgrave.

GENTIANACEÆ.

Gentiana amarella L. Sp. Pl. i, 230 (1753). Type specimens from Europe.

Cape Phipps, July 23 (No. 72), and Disenchantment Bay, August 11 (No. 104); at both points growing on the beach. Two forms are represented in these two numbers, the best disposal of which, in the present state of our knowledge concerning the varieties of *G. amarella*, is to refer them to that species without a varietal designation. No. 72 has purplish foliage and stem, blue flowers, and a deeply cleft calyx, the narrow lobes of which are not more than one-half as long as the corolla. No. 104, while very similar in form and size, has green herbage, yellow flowers, and a calyx with more foliaceous divisions, the larger commonly two-thirds to three-fourths as long as the corolla.

Gentiana platypetala Griseb. Gent. 191 (1839). The type specimens were collected on the island of Sitka during the second expedition of Kotzebue in the early part of the present century, and none have been reported since.

Disenchantment Bay, August 12 (No. 108). It has been impossible to compare ours with the original specimens, yet from Grisebach's description we appear to have the same plant. It closely resembles small specimens of *G. calycosa*, the stems being 15 to 22 cm. high and bearing 6 to 10 pairs of ovate-oblong, obtuse or bluntly acute leaves. Each stem is terminated by a single sessile flower involucrately surrounded by 2 or 3 pairs of leaves, the inner reduced. The calyx, which is about one-half as long as the tube of the campanulate blue corolla, has a spathaceous membranaceous tube 10 to 14 mm. long, which usually spreads open along two opposite lines nearly to the base, the free margins being thin, scarious, and apparently not torn. The calyx lobes proper are minute, lanceolate, acute, herbaceous organs about 3 mm. long. The corolla lobes are conspicuously narrower at their insertion, broader than long, and abruptly acuminate, while the plaits in the sinuses are triangular, broader than high, and acute or emarginate.

Menyanthes trifoliata L. Sp. Pl. i, 145 (1753). Type locality European.

Khantaak Island, June 20 (No. 39); common in fresh-water ponds, growing both in the water and on the adjacent wet soil.

HYDROPHYLLACEÆ.

Romanzoffia sitchensis Bong. Veg. Sitch. 158 (1831). Type locality, Sitka.

Near Dalton Landing, August 15 (No. 123), growing among shaded rocks in a canyon leading from the St. Elias range. This plant so closely resembles a small saxifrage, *Saxifraga nudicaulis* for example, that a critical look at the corolla is necessary to distinguish it. Even the thickened bases of the petioles and the two divergent carpels of the mature fruit precisely simulate those of certain saxifrages, yet they have the most widely different genetic relation.

BORAGINACEÆ.

Pneumaria maritima (L.) Hill, Veg. Syst. vii, 40 (1764); *Pulmonaria maritima* L. Sp. Pl. i, 136 (1753). Type locality, the sandy beaches of England.

On the west side of Yakutat Bay, about 10 kilometers north of Point Manby, June 28 (No. 50). Around Disenchantment Bay, also, the plant is common, and, as at the other locality, confined to the sandy beach.

SCROPHULARIACEÆ.

Mimulus langsdorfii Donn; Sims, Bot. Mag. t. 1501 (1812). Description drawn from specimens grown in the Botanic Garden at Cambridge, England, the seed coming "from Unashka [Unalaska], one of the Fox Islands." This is the *Mimulus luteus* of most American authors.

On the east side of Yakutat Bay, 26 kilometers north of the Mission, July 14 (No. 55), along a stream in dense woods; and again on a small stream emptying into Disenchantment Bay.

Veronica alpina L. Sp. Pl. i, 11 (1753). Type locality European.

Disenchantment Bay, August 9 (No. 97), near a water course; found but sparingly.

Castilleja miniata Dougl.; Hook. Fl. Bor. Amer. ii, 106 (1838). Type specimens from the Blue Mountains of Oregon.

On a sandy point at the mouth of the Ankow River, June 13 (No. 21), and in Disenchantment Bay, August 3 (No. 82); the former with yellowish, the latter with red bracts. The plant is abundant in the valleys and lowlands about Yukutat Bay, and occurs occasionally up to an altitude of 550 meters.

Castilleja parviflora Bong. Veg. Sitch. 158 (1831). Type specimens collected near Sitka.

Disenchantment Bay, August 5 (No. 89); found in but one place, on the southern slope of a mountain, about 600 meters above the sea. These specimens were thus identified by the late Mr. H. E. Seaton.

Euphrasia officinalis L. Sp. Pl. ii, 604 (1753). Type specimens from Europe.

Dalton Landing, August 15 (No. 125); common in sandy soil of the beach. The specimens have less spinescent leaves and smaller flowers than the typical European plant.

Pedicularis palustris wlassowiana (Steven) Bunge, in Ledeb. Fl. Ross. iii, 283 (1847); *P. wlassowiana* Steven, Mon. Pedic. 27, t. 9, fig. 1 (1822).

At the entrance of Disenchantment Bay, July 24 (No. 75); growing along a sandy beach just above the line of high tide. The lower lip in these specimens is unusually short, not more than one-half as long as the galea.

Pedicularis sudetica Willd. Sp. Pl. iii, 209 (1800). Described from plants collected in the Sudetic Mountains and in Siberia.

Disenchantment Bay, August 9 (No. 98); from sea level to an altitude of 120 meters.

Rhinanthus crista-galli L. Sp. Pl. ii, 603 (1753). Type locality European.

Ocean Cape, July 18 (No. 68), and at Dalton Landing; growing in both stations on the sandy beach.

POLYGONACEÆ.

Polygonum viviparum L. Sp. Pl. i, 360 (1753). Type locality, European.

On a bluff along the Ankow River, about 10 kilometers above its mouth, July 16 (No. 65), and on the shores of Disenchantment Bay, 200 meters above the sea.

FAGACEÆ.

Alnus rubra Bong. Veg. Sitch., 162 (1831). The type specimen was collected at Sitka by Mertens.

Khantaak Island, May 27 (No. 3). For the distribution of this plant, the red alder, see page 328.

SALICACEÆ.

Salix arctica Pall. Fl. Ross. i, pt. ii, 86 (1788). Type locality "in plaga arctica muscosa nuda secundum Sinum Obensem et versus glacialem Oceanum."

Disenchantment Bay, August 13 (No. 117). This willow, according to Mr. Funston's notes, is common on the rocky mountain slopes about Disenchantment Bay, extending from sea level to the limit of vegetation. These specimens have obovate to orbicular, glabrous, reticulated leaves, glaucous beneath, rounded at the base, the blades of the larger ones 2 to 2.5 cm. long. They bear mature fruit, the capsules glabrous. This form of *Salix arctica* is not known in the United States proper. Our specimens have a short, thick, woody trunk, often 1 cm. in diameter and two to three times as long, scarcely rising above the surface of the ground. From this trunk arise lateral branches 10 to 30 cm. in length, which retain their vitality only a few years, spreading on the ground and ascending to the height of a few centimeters. The trunk is firmly fixed in the ground by means of stout roots.

Salix barclayi Anders. Proc. Amer. Acad. iv, 66 (1858). The type specimens were collected on Kadiak Island by Barclay.

Khantaak Island, May 30 (No. 6). For notes on this species, see page 328.

ORCHIDACEÆ.

Habenaria bracteata (Willd.) R. Br.; Ait. Hort. Kew. ed. 2, v, 192 (1813); *Orchis bracteata* Willd. Sp. Pl. iv, 34 (1805). Type specimen from Pennsylvania.

Disenchantment Bay, August 12 (No. 112). Scattered specimens were found from sea level to an altitude of more than 1,000 meters.

Habenaria dilatata (Pursh) Hook. Exot. Fl. ii, 95 (1825); *Orchis dilatata* Pursh, Fl. ii, 588 (1814). Type specimen from Labrador.

Along the Ankow River, near Ocean Cape, July 1 (No. 52). The plant grows in moist, shaded parts of the forest region; and its snow-white flowers, according to Mr. Funston's observations, are very fragrant. Determined by Thomas Morong.

Habenaria hyperborea (L.) R. Br.; Ait. Hort. Kew. v, 193 (1813); *Orchis hyperborea* L. Mant. i, 121 (1767).

Along the Ankow River, about 10 kilometers above its mouth, July 16 (No. 64); abundant in fresh-water swamps. Determined by Thomas Morong.

IRIDACEÆ.

Iris setosa Pall.; Link, Jahresb. i, pt. iii, 71 (1841).

At the mouth of the Ankow River, July 3 (No. 53), in sandy soil near a fresh-water pond. The Indians are said to use the rootstock as a medicinal charm.

LILIACEÆ.

Streptopus amplexifolius (L.) Lam. & DC. Fl. Franc. iii, 174 (1805); *Uvularia amplexifolia* L. Sp. Pl. i, 304 (1753). Type locality, European.

About 25 kilometers north of the Mission, July 14 (No. 61); common in the dense woods, and on Mount Tebenkof found at the altitude of 180 meters. Fruiting specimens were collected on Khantaak Island, August 27.

Fritillaria camschatcensis (L.) Ker, Bot. Mag. under t. 1216 (1809); *Lilium camschatcensis* L. Sp. Pl. i, 303 (1753). Type locality, Kamchatka.

Khantaak Island, June 20 (No. 38). It occurs in openings throughout the lowland forest area in the vicinity of Yakutat Bay, ascending on Mount Tebenkof to an altitude of 900 meters. The use of this plant for food is recorded in Hooker's Flora Boreali-Americana, p. 181, as follows: "Voyagers to Kamtschatka (where this species seems more abundant than on the American coast) bring home small, white, granulated esculent roots, dried on strings. These are the bitter tubers of this *Fritillary*,

which are also copiously eaten by the Indians of Stikine, and known by the names of *Koch* or *N. W. Rice;* but Mr. Toline says they are bitter and nauseous." For the use of the plant among the Thlinkets, see page 330.

Tofieldia glutinosa (Michx.) Pers. Syn. i, 399 (1805); *Narthecium glutinosum* **Michx.** Fl. i, 210 (1803). Type specimen collected between Quebec and Lake Mistassinie.

Khantaak Island, June 27 (No. 47), along the margin of a fresh-water marsh.

JUNCACEÆ.

Juncus falcatus alaskensis var. nov.; probably *J. falcatus sitchensis* Buch. Monog. Junc. 428 (1890), not *J. arcticus sitchensis* Engelm. (1866). Type specimen in the United States National Herbarium, collected July 18, 1892, at Ocean Cape, Yakutat Bay, Alaska, by Frederick Funston (No. 67), growing in openings in the forest.

In the typical form of the species, which was originally collected at Monterey, California, and which seems to range as far northward as Puget Sound, the styles are long, the stigmas conspicuously exserted, and the anthers much longer than their filaments, as in *J. orthophyllus,* but specimens collected at various points from Yakutat Bay, Alaska, to the Aleutian Islands have a very short, thick style, and anthers little longer than their filaments. No fruiting specimens have been seen, but the plant is doubtless the same as Dr. Buchenau's variety *sitchensis,* which was described, presumably from Alaskan specimens, as having a retuse obcordate capsule instead of the obtuse ovate one of the type form. The plant occurs on the Aleutian islands, Atka and Unalaska, on the Shumagin Islands, at Yakutat Bay, and perhaps farther southward along the Alaskan coast.

Juncoides campestre sudeticum (Willd.) Coville, Contr. Nat. Herb. iv, 208 (1893); *Juncus sudeticus* Willd. Sp. Pl. ii, 221 (1799); *Luzula campestris sudetica* Celakovsky, Prodr. Fl. Bœhm. 749 (1881). Type locality, the summit of the Sudetic Mountains, of Silesia.

Knight Island, June 18 (No. 28), growing on bare, well-drained sandy points.

CYPERACEÆ.

Eleocharis watsoni Babb. Ann. & Mag. Nat. Hist. ser. 2, x, 20 (1852). Type specimen collected on the seacoast of Scotland, near Tayanloan, Argyleshire.

Along the Ankow River, August 28 (No. 135); abundant along the margins of lagoons and fresh-water swamps. Mr. C. B. Clarke[1] has disposed of this species as a variety, *watsoni,* of *E. palustris;* but if our specimens are fairly representative of the plant, it appears much more satisfactory to treat it as a distinct species. They have culms 20 to 40 cm. high, spikes at maturity 4 to 6 mm. in diameter and 7 to 15 mm. long, bracts of the spike black, with hyaline margins, and setæ equaling the nutlet. The plant was identified by Dr. N. L. Britton.

Carex decidua[2] Boott, Proc. Linn. Soc. i, 255 (1845). Type specimens from the Falkland Islands and from Port Famine, Straits of Magellan.

On the Ankow River, August 28 (No. 134); common in fresh-water swamps and along the edges of lagoons.

Carex festiva pachystachya Bailey, Mem. Torr. Club, i, 51 (1889).

Mainland, near Mission, Yakutat Bay, June 19 (No. 30); found wherever there is no shade. Common on the Ankow.

Carex limosa stygia (Fries) Bailey, Proc. Amer. Acad. xxii, 95 (1887); *C. stygia* Fries, Mant. iii, 141 (1842).

Knight Island, June 18 (No. 27); common along the edges of fresh-water ponds on the mainland and islands of the bay.

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[1] Journal of Botany, xxv, 268 (1887).

[2] The specimens of Carex were determined by Professor L. H. Bailey.

POACEÆ.[1]

Savastana odorata (L.) Scribn. Mem. Torr. Club, v, 34 (1894); *Holcus odoratus* L. Sp. Pl. ii, 108 (1753); *Hierochloa borealis* Roem. & Schult. Syst. ii, 513 (1817). Type specimens from Europe.

Khantaak Island, June 20 (No. 36); found along the edges of bluffs about 6 meters above sea level.

Phleum alpinum L. Sp. Pl. i, 59 (1753). Type specimens from Europe.

On dry sand bars along streams, from sea level to 60 meters elevation. Abundant at Dalton Landing, August 16 (No. 119); a few scattering specimens on Khantaak Island.

Agrostis exarata Trin. Diss. i, 207 (1824). Type locality, Unalaska.

Growing in scattered clumps on dry sand bars along small rivers which empty into the sea. Disenchantment Bay, August 17 (No. 118); from sea level to 60 meters elevation..

Calamagrostis langsdorffii (Link.) Trin. Gr. Unifl. 225 (1824); *Arundo langsdorffii* Link, Enum. i, 74 (1821). Type locality, Siberia.

Ankow River, August 28 (No. 136); found generally along the beach near the edge of the forest, and on bluffs near the rivers.

Deschampsia cæspitosa (L.) Beauv. Agrost. 91 (1812); *Aira cæspitosa* L., Sp. Pl. i, 64 (1753). Type specimen from Europe.

Yakutat Bay, August 27 (No. 133); found everywhere in the vicinity of Yakutat Bay, often in great abundance. It occupies all the open, but not swampy, spaces in the forests, and is found in abundance on the bluffs near the seashore and on the southern slope of Mount Tebenkof, to an altitude of 525 meters.

Deschampsia cæspitosa longiflora (Trin.) Vasey, Descr. Cat. Gr. 29 (1883); *Aira cæspitosa longiflora* Trin; Thurb. Bot. Wilkes Exped. xvii, 487 (1873–74). Type locality, "Nisqually and the north branch of the Columbia."

Disenchantment Bay, August 12 (No. 111); found in large quantities on the slopes of mountains, at from 250 to 775 meters altitude, between the upper limit of red alder and the lower limit of summer snow, where it gives the mountains their light-green color. Some tracts of hundreds of acres of mountain slope are covered with it, to the exclusion of all other vegetation. It is not found in the forest country.

Poa alpina L. Sp. Pl. i, 67 (1753). Type specimen from Europe.

Dalton Landing, August 15 (No. 127); growing abundantly in small clusters on dry sand bars near Dalton Creek; also found near Cape Manby.

Poa glumaris Trin. Mem. Acad. St. Petersb. ser. 6, i, 379 (1831). Type locality, Arctic Siberia.

Khantaak Island, August 29 (No. 137); common on gravelly beaches out of reach of high tides.

Puccinellia maritima (Huds.) Parl. Fl. Ital. i, 370 (1848); *Poa maritima* Huds. Fl. Angl. 42 (1762).

On the mainland near the Mission, at sea level; also on the beach at the base of Mount Tebenkof, June 21 (No. 31); found only near the beach, where it grows in dense clumps; not common.

Elymus arenarius L. Sp. Pl. i, 83 (1753). Type specimen from Europe.

Near the Mission, August 29 (No. 140); abundant along sandy beaches, but found only near the sea. The thick culms play an important part in the basket making of the Thlinket Indians. When green they are cut, stripped of leaves, and dried near a fire. They are then used to form the uprights or framework around which are woven split spruce roots.

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[1] Determined by the late Dr. George Vasey.

PINACEÆ.

Picea sitchensis (Bong.) Carr. Trait. Con. 260 (1855); *Pinus sitchensis* Bong. Veg. Sitch. 164 (1831). Type specimen from Sitka.

Khantaak Island, August 27 (No. 131). The specimens bear well-developed cones with nearly mature seeds. For the distribution and uses of the tree, see pages 328 and 334.

Tsuga mertensiana (Bong.) Carr. Trait. Con. ed. 2, 250 (1867); *Pinus mertensiana* Bong. Veg. Sitch. 163 (1831). Type specimens collected at Sitka by Mertens.

Yakutat Bay, August 27 (No. 132). For notes on this tree, see page 328.

Chamæcyparis nootkatensis (Lamb.) Spach, Hist. Veg. xi, 333 (1842); *Cupressus nootkatensis* Lamb. Pin. ii, 18 (1824).

Khantaak Island, September (No. 147). The specimens bear mature cones with fully grown seeds, in many cases capable of germination. Only a single individual of this, the Sitka cypress, was seen by Mr. Funston in the territory that he traversed. The tree does not follow in its range the same course as *Picea sitchensis*, but in the southern portion of its range, in Oregon, is found remote from the coast in the region of the Cascade Mountains.

LYCOPODIACEÆ.

Lycopodium alpinum L. Sp. Pl. ii, 1104 (1753). Type locality European.

Growing in abundance, but at only one place, on the bleak summit of a mountain 1,175 meters high, on the mainland southeast of Haenke Island. Collected August 13 (No. 113). At the base of some of the branches the complanate character of the stem and leaves is very marked, but in most parts of the plant this character is not seen.

Lycopodium annotinum L. Sp. Pl. ii, 1103 (1753). Type locality European.

Near the Mission, August 29 (No. 139); abundant throughout the lowland forest, growing on decayed logs and in other similar soil.

EQUISETACEÆ.

Equisetum variegatum Schleich. Cat. Pl. Helv. ed. 2, 27 (1807).

Khantaak Island, August 30 (No. 142); common near the fresh-water swamps. Determined by L. M. Underwood.

POLYPODIACEÆ.

Polypodium vulgare L. Sp. Pl. ii, 1085 (1753). Type locality European.

Near the Mission, June 6 (No. 13). The species is common throughout the forested area.

Cryptogramme acrostichoides R. Br.; Richards. App. Frankl. Journ. 754 (1823). The plant is more fully described in Brown's Addenda to the same work (p. 767), where it is stated that the specimens were found by Menzies at Nootka Sound, Vancouver Island.

Dalton Landing, August 16 (No. 129); abundant among rocks.

Dryopteris spinulosa (Retz.) Kuntze, Rev. Gen. Pl. ii, 810 (1891); *Polypodium spinulosum* Retz. Fl. Scand. ed. 2, 250 (1795); *Aspidium spinulosum* Swartz; Schrad. Journ. Bot. ii, 38 (1800).

Near the Mission, June 19 (No. 33). The sporangia are immature at this season. This fern grows in the greatest profusion in the damp mossy woods about the Mission. On Mount Tebenkof, up to an altitude of 600 meters, certain areas were densely covered with the plant.

Phegopteris dryopteris (L.) Fee, Gen. Fil. 243 (1850–1852); *Polypodium dryopteris* L. Sp. Pl. ii, 1093 (1753). Type specimen from Europe.

Near the Mission, August 29 (No. 138). This fern grows in the greatest profusion in the spruce forest of the lowlands about Yakutat Bay. On Mount Tebenkof it was found at an altitude of 380 meters.

Dryopteris lonchitis (L.) Kuntze, Rev. Gen. Pl. ii, 813 (1891); *Polypodium lonchitis* L. Sp. Pl. ii, 1088 (1753); *Aspidium lonchitis* Swartz; Schrad. Journ. Bot. ii, 38 (1800). Type locality, the mountains of Europe.

Near the cabin, about 3 kilometers from Dalton Landing, August 15 (No. 126). Only one specimen was seen.

Cystopteris fragilis (L.) Bernh. Neues Journ. Bot. i, pt. ii, 26 (1806); *Polypodium fragile* L. Sp. Pl. ii, 1091 (1753). Type specimens from Europe.

Disenchantment Bay, August 14 (No. 120); found sparingly on the cliffs near the beach. Determined by L. M. Underwood.

BRYACEÆ.[1]

Polytrichum attenuatum Menz.; *P. formosum* Hedw. Khantaak Island and mainland near the Mission (No. 17); common around the bases of trees and on decaying logs.

Polytrichum urnigerum L.; *Pogonatum urnigerum* Drum. Collected with the preceding (No. 152).

Astrophyllum punctatum (L.) Lindb.; *Mnium punctatum* Hedw. Khantaak Island (Nos. 62 and 145); on decaying tree trunks, in shaded places.

Dicranum fragilifolium Lindb. Khantaak Island (No. 154); growing on decaying tree trunks.

Dicranum fuscescens Turn. Khantaak Island (No. 149); common on the bark of *Alnus rubra.*

Dicranum majus Turn. In woods on Khantaak Island (No 157).

Ceratodon purpureus (L.) Brid. Khantaak Island (No. 159).

Ulota barclayi Mitt. Khantaak Island (No. 158); on the bark of *Alnus rubra.*

Climacium ruthenicum Lindb. Khantaak Island (No. 153).

Brachythecium lætum (Brid.) Bruch & Schimp.; *Hypnum lætum* Brid. Khantaak Island (No. 156).

Hylocomium loreum (L.) Bruch & Schimp.; *Hypnum loreum* L. Khantaak Island (No. 146). Growing with *Hylocomium squarrosum.*

Hylocomium proliferum (L.) Lindb.; *Hypnum splendens* Hedw. Common in the woods on Khantaak Island (No. 148).

Hylocomium squarrosum (L.) Bruch & Schimp.; *Hypnum squarrosum* L. Khantaak Island (No. 155). This moss is abundant in the forests around Yakutat Bay, growing on tree trunks and stumps. The highest point at which it was noted was 150 meters above sea level on the side of Mount Tebenkof.

Hypnum arcuatum Lindb. Khantaak Island (No. 160); growing with *Hylocomium proliferum.*

Hypnum circinale Hook. Khantaak Island (No. 150); growing on decaying logs.

Hypnum uncinatum Hedw. Khantaak Island (No. 144); growing on decaying tree trunks.

SPHAGNACEÆ.[2]

Sphagnum squarrosum semisquarrosum Russ. Khantaak Island (No. 141). This moss grows in abundance along the borders of bogs and swamps, both on the island and on the mainland.

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[1] Determined by J. M. Holzinger.

[2] Determined by Dr. Christian Warnstorf.

JUNGERMANNIACEÆ.[1]

Blepharostoma trichophyllum (L.) Dum. Near Yakutat Bay (No. 161).

Cephalozia divaricata (Sm.) Dum. Near Yakutat Bay (No. 162).

Cephalozia multiflora Spruce. Near Yakutat Bay (No. 163).

Frullania nisquallensis Sulliv. Near Yakutat Bay (No. 164).

Kantia trichomanis (L.) S. F. Gray. Near Yakutat Bay (No. 165).

Lepidozia reptans (L.) Dum. Near Yakutat Bay (No. 166).

Plagiochila asplenioides (L.) Dum. Near Yakutat Bay (No. 167).

Radula krausei Steph. Near Yakutat Bay (No. 168).

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[1] Among the mosses collected by Mr. Funston were detected several fragments of Hepaticæ, which have been determined by Mr. A. W. Evans.

LIST OF SPECIMENS.

1. Rubus spectabilis Pursh.
2. Fragaria chiloensis (L.) Lam.
3. Alnus rubra Bong.
4. Caltha palustris L.
5. Ribes laxiflorum Pursh.
6. Salix barclayi Anders.
7. Cardamine oligosperma Nutt.
8. Vaccinium ovalifolium Smith.
9. Rubus stellatus Smith.
10. Trientalis europæa arctica (Hook.) Fisch.
11. Coptis trifolia (L.) Salisb.
12. Viola langsdorfii Fisch.
13. Polypodium vulgare L.
14. Actæa spicata arguta (Nutt.) Torr.
15. Arabis hirsuta (L.) Scop.
16. Tiarella trifoliata L.
17. Polytrichum attenuatum Menz.
18. Arenaria lateriflora L.
19. Arenaria lateriflora L.
20. Lathyrus maritimus (L.) Bigel.
21. Castilleja miniata Benth.
22. Viburnum pauciflorum Pylaie.
23. Cornus canadensis L.
24. Sambucus racemosa L.
25. Geum macrophyllum Willd.
26. Menziesia ferruginea Smith.
27. Carex limosa stygia (Fries) Bailey.
28. Juncoides campestre sudeticum (Willd.) Coville.
29. Ranunculus nelsonii (DC.) Gray.
30. Carex festiva pachystachya Bailey.
31. Puccinellia maritima (Huds.) Parl.
32. Glaux maritima L.
33. Dryopteris spinulosa (Retz.) Kuntze.
34. Potentilla anserina L.
35. Lupinus nootkatensis unalaskensis Wats.
36. Sayastana odorata (L.) Scribn.
37. Arenaria peploides L.
38. Fritillaria camschatcensis (L.) Ker.
39. Menyanthes trifoliata L.
40. Saxifraga punctata L.
41. Saxifraga mertensiana Bong.
42. Claytonia sibirica L.
43. Nymphæa polysepala (Engelm.) Greene.
44. Cœlopleurum gmelini (DC.) Ledeb.
45. Heracleum lanatum Michx.
46. Erigeron salsuginosus (Richards.) Gray.
47. Tofieldia glutinosa (Michx.) Pers.
48. Viola langsdorfii Fisch.
49. Epilobium latifolium L.
50. Pneumaria maritima (L.) Hill.
51. Phellopterus littoralis Schmidt.
52. Habenaria dilatata (Pursh) Hook.
53. Iris setosa Pall.
54. Moneses uniflora (L.) Gray.
55. Mimulus luteus L.
56. Campanula rotundifolia alaskana Gray.
57. Pyrola secunda L.
58. Epilobium luteum Pursh.
59. Heuchera glabra Willd.
60. Saxifraga stellaris L.
61. Streptopus amplexifolius (L.) DC.
62. Astrophyllum punctatum (L.) Lindb.
63. Potentilla palustris (L.) Scop.
64. Habenaria hyperborea (L.) R. Br.
65. Polygonum viviparum L.
66. Sanguisorba latifolia (Hook.) Coville.
67. Juncus falcatus alaskensis Coville.
68. Rhinanthus crista-galli L.
69. Achillea millefolium L.
70. Ligusticum scothicum L.
71. Cicuta virosa L.
72. Gentiana amarella L.
73. Selinum gmelini (Cham. & Schlecht.) Kurtz.
74. Viola glabella Nutt.
75. Pedicularis palustris wlassoviana (Steven) Bunge.
76. Circæa alpina L.
77. Lathyrus palustris L.
78. Aster foliaceus Lindl.
79. Arnica latifolia Bong.
80. Epilobium palustre L.
81. Ranunculus reptans L.
82. Castilleia miniata (Benth.) Dougl.
83. Tellima grandiflora (Pursh) R. Br.
84. Arabis lyrata L.
85. Cerastium alpinum L.
86. Pyrola minor L.
88. Parnassia fimbriata Koenig.
87. Valeriana sitchensis Bong.
89. Castilleja parviflora Bong.
90. Luetkea pectinata (Pursh) Kuntze.
91. Saxifraga bronchialis L.
92. Sorbus occidentalis (Wats.) Greene.
93. Artemisia norvegica pacifica Gray.
94. Potentilla villosa Pall.
95. Barbarea barbarea (L.) McMillan.
96. Draba stenoloba Ledeb.
97. Veronica alpina L.
98. Pedicularis sudetica Willd.
99. Ranunculus cooleyæ Vasey & Rose.
100. Geranium erianthum DC.
101. Antennaria alpina (L.) Gaertn.
102. Campanula rotundifolia alaskana Gray.
103. Potentilla villosa Pall.
104. Gentiana amarella L.
105. Tussilago frigida L.
106. Antennaria margaritacea (L.) Hook.

107. Hieracium triste Willd.
108. Gentiana platypetala Griseb.
109. Bryanthus glanduliflorus (Hook.) Gray.
110. Cassiope stelleriana (Pall.) DC.
111. Deschampsia cæspitosa longiflora Trin.
112. Habenaria bracteata (Willd.) R. Br.
113. Lycopodium alpinum L.
114. Anemone narcissiflora L.
115. Prenanthes alata (Hook.) Gray.
116. Aconitum delphinifolium DC.
117. Salix arctica Pall.
118. Agrostis exarata Trin.
119. Phleum alpinum L.
120. Cystopteris fragilis (L.) Bernh.
121. Aquilegia formosa Fisch.
122. Arnica latifolia Bong.
123. Romanzoffia sitchensis Bong.
124. Potentilla procumbens (L.) Clairv.
125. Euphrasia officinalis L.
126. Dryopteris lonchitis (L.) Kuntze.
127. Poa alpina L.
128. Epilobium latifolium L.
129. Cryptogramme acrostichoides R. Br.
130. Geum calthifolium Smith.
131. Picea sitchensis (Bong.) Carr.
132. Tsuga mertensiana (Bong.) Carr.
133. Deschampsia cæspitosa (L.) Beauv.
134. Carex decidua Boott.
135. Eleocharis watsoni Babb.
136. Calamagrostis langsdorfii (Link) Trin.
137. Poa glumaris Trin.
138. Phegopteris dryopteris (L.) Fee.
139. Lycopodium annotinum L.
140. Elymus arenarius L.
141. Sphagnum squarrosum semisquarrosum Russ.
142. Equisetum variegatum Schleich.
143. Echinopanax horridum Smith.
144. Hypnum uncinatum Hedw.
145. Astrophyllum punctatum (L.) Lindb.
146. Hylocomium loreum (L.) Bruch & Schimp.
147. Chamæcyparis nootkatensis (Lamb.) Spach.
148. Hylocomium proliferum (L.) Lindb.
149. Dicranum fuscescens Turn.
150. Hypnum circinale Hook.
151. Rubus pedatus Smith.
152. Polytrichum urnigerum L.
153. Climacium ruthenicum Lindb.
154. Dicranum fragilifolium Lindb.
155. Hylocomium squarrosum (L.) Bruch & Schimp.
156. Brachythecium lætum (Brid.) Bruch & Schimp.
157. Dicranum majus Turn.
158. Ulota barclayi Mitt.
159. Ceratodon purpureus (L.) Brid.
160. Hypnum arcuatum Lindb.
161. Blepharostoma trichophyllum (L.) Dum.
162. Cephalozia divaricata (Sm.) Dum.
163. Cephalozia multiflora Spruce.
164. Frullania nisquallensis Sulliv.
165. Kantia trichomanis (L.) S. F. Gray.
166. Lepidozia reptans (L.) Dum.
167. Plagiochila asplenioides (L.) Dum.
168. Radula krausei Steph.