



5-1-1893

Alaska.

John Muir

Follow this and additional works at: <https://scholarlycommons.pacific.edu/jmb>

Recommended Citation

Muir, John, "Alaska." (1893). *John Muir: A Reading Bibliography by Kimes, 1986 (Muir articles 1866-1986)*. 211.

<https://scholarlycommons.pacific.edu/jmb/211>

This Article is brought to you for free and open access by the John Muir Papers at Scholarly Commons. It has been accepted for inclusion in John Muir: A Reading Bibliography by Kimes, 1986 (Muir articles 1866-1986) by an authorized administrator of Scholarly Commons. For more information, please contact mgibney@pacific.edu.

which is indeed of coarsest texture. One-third of the stump had been rotted out with its pithy center before petrification took place. The same must have been the case with some fascicles of cells leaving tubular holes through the length of its growth, some being $\frac{1}{2}$ inch in diameter. A still better find was a section of a trunk eight inches long and ten inches thick, from which the perfect characteristics of the tree can be ascertained. From the latter the description and illustration are taken.

ENDOGEN.

Genus: *Winchellina*. (n. gen.).

Winchellina fascina. (n. sp.)

Among the flora of endogens our new genus stands isolated. If no interior arrangement could be ascertained, the exterior only would let us surmise a palm or fern in this form. But the excellent preservation of this plant showing so minutely its inner organization makes it an object of high interest in our fossil flora, as well as in the botanical world. I have named it *Winchellina* as a token of kind remembrance of the late Dr. Alex. Winchell of Ann Arbor. While we have in numerous plants well developed cell-bundles so arranged as to cause a harmonious cellular promotion and necessarily interwoven with the whole organism, we observe in our plant an arrangement, as it were, of independent growth of fascicles. Each of them being encased by a very thick periderm, exhibits a peculiar inner tissue of oblong sub-quadrate cells with thick walls, simulating a transverse section of Carboniferous fossil pine. The whole tree is composed of such fascicles which are $\frac{3}{4}$ inch mean diameter, the outer ones crowding each other in contorted and polygonal forms and causing the longitudinally ribbed exterior. Toward the more inner portion the fascicles become more circular, parenchymous tissue filling the space. The third zone is crowded again with small oval fascicles enclosing tightly the parenchymous center $2\frac{1}{2}$ inches in diameter, the structure of which can be seen in small perfectly circular cells.

It is likely that this was a most stately tree and that each fascicle shot out an independent branch crowning the tree with a bundle of diverging long, linear, reed-like branches.

from The American Geologist.
Vol. XI, No. 5, May 1893

ALASKA.

By JOHN MUIR, Martinez, Cal.

The trip to Alaska from Tacoma through Puget sound and the thousand islands of the Alexander archipelago is perfectly enchanting. Apart from scientific interests, no other excursion that I know of may be made into the wilds of America in which so much fine and grand and novel scenery is unfolded to view. Gazing from the deck of the steamer one is borne smoothly on over the calm blue waters through the midst of a multitude of lovely islands clothed with evergreens. The ordinary discomforts of a sea voyage, so formidable to some travelers, are not felt; for the way lies through a network of sheltered island channels that are about as free from the heaving waves that cause seasickness as rivers are.

Never before the year 1879, when I made my first trip to Alaska, had I been amid scenery so hopelessly beyond description. It is a web of land and water thirty or forty miles wide, and about a thousand miles long, outspread like embroidery along the margin of the continent, made up of an infinite multitude of features, and all so fine and ethereal in tone the best words seem coarse and unavailing. Tracing the shining levels through sound and strait, past forests and waterfalls, between a constant succession of fair azure headlands, it seems as if surely at last you must reach the best paradise of the poets—the land of the blessed.

Some of the channels through which you glide are extremely narrow as compared with the height of the walls that shut them in. But, however sheer the walls, they are everywhere forested to the water's edge. And almost every individual tree may be seen as they rise above one another—the blue-green, sharply spired, Menzies spruce; the warm yellow-green Merten spruce, with finger-like tops all pointing in one direction, or gracefully drooping; and the airy, feathery, brownish-green Alaska cedar. In such reaches you seem to be tracing some majestic river. The tide currents, the fresh driftwood brought down by avalanches, the inflowing streams, and the luxuriant over-hanging foliage of the shores, making the likeness all the more complete.

But the view changes with magical rapidity. Rounding some bossy cape the steamer turns into a passage hitherto unseen, and glides through into a wide expanse filled with smaller islands

sprinkled wide apart, or clustered in groups such as only Nature could invent. Some are so small and low the trees covering them seem like mere handfuls that have been culled from the larger islands and set in the water to keep them fresh; the outer fringing trees around the sides oftentimes spreading like flowers leaning out against the rim of a vase. Thus thoughtfully beautiful are these 'blessed' islands; and their beauty is the beauty of youth. For though the softness of their verdure must be ascribed to the copious and warm moisture in which they are bathed, from the mild ocean-current that comes from Japan, the Japan current that bathes these shores is itself young, while the very existence of the islands, their main features, finish and peculiar distribution, are directly referable to the structure of the rocks, and the action of ice upon them during the glacial period, now drawing to a close.

The first stop made by the Alaska steamers after touching at Seattle, Port Townsend, Victoria and Nanaimo, is usually at Fort Wrangel, the distance between the last two places being about 600 miles. Wrangel is a boggy place, but is favorably situated as a center for excursions to some of the most interesting portions of the country. Indians may be seen on the platforms of the half dozen stores, chiefly grim women and cubby, chubby children with wild eyes. Most of them have curiosities to sell when a steamer arrives, or a basketful of berries, red, yellow and blue, which look wondrous clean as compared with the people. They are a proud and intelligent race, nevertheless, and maintain an air of self-respect that no amount of frazzled raggedness and squalor can wholly subdue. Many canoes may be seen along the shores, all fashioned alike, with long beak-like sterns and prows. What the mustang is to the Vacquero the canoe is to the Indian of the Alaska coast. Yonder you see a whole family, grandparents and all, making a direct course for some islands five or six miles away. They are going to gather berries, as the baskets show. Nowhere in my travels north or south have I ever seen so many berries. The woods and meadows are full of them—huckleberries of many species, salmonberries, blackberries, currants and gooseberries with strawberries and serviceberries in the drier grounds, and cranberries in the bogs, sufficient for every worm, bird, beast and human being in the territory, and thousands of tons to spare. The Indians beat them into pulp, press the pulp into cakes about an inch thick, and dry them for winter use with their oily salmon. So fruitful is Alaska.

The coast climate is remarkably bland and temperate. It is rainy, however, but the rain is good of its kind: mild in temperature, gentle in its fall, filling the fountains of the streams, and keeping the whole land fresh and fertile. While anything more delightful than the shining weather after the rain—the great round sun-days of June, July and August, can hardly be found elsewhere. Strange as it may appear, many who are looking to Italy for health had better turn their eyes to Alaska. An Alaska mid-summer day is a day without night. In the extreme northern portion of the territory the sun does not set for weeks, and even as far south as Sitka and Wrangel the rosy colors of evening blend with those of the morning, leaving no darkness between. Nevertheless the full day opens slowly. A low arc of colored light steals round to the northeastward with gradual increase of height and span, the red clouds with yellow dissolving edges subside into hazy dimness, the islands with ruffs of mist about them cast ill-defined shadows and the whole firmament changes to pale pearl-gray.

As the day advances toward high noon, the sun flood pouring through the damp atmosphere lights the waters and sky to glowing silver. Brightly now play the ripples about the edges of the islands, and over plume-shaped streaks between them where the water is stirred by some passing breeze. On the mountains of the main-land and in the high walled fiords and canons still brighter is the work of the sunshine. The broad white bosoms of the glaciers glow like molten silver, and their crystal fronts and multitude of icebergs are kindled to a blaze of irised light.

You are warmed and awakened into sympathy with all the world. Through the midst of the brooding silence the life and motion about you comes to mind—the weariless tides swaying the dulse over thousands of miles of sea-meadows, the foaming rivers, the swift floods of light through the satiny sky, the marvelous abundance of fishes, the wild sheep and goats on a thousand grassy ridges above the forests, bears feasting in the berry tangles, the beaver and mink and otter far back on many a rushing stream. Indians and adventurers pursuing their lonely ways, the leaves of the forests feasting on the sunbeams, and the glaciers in glorious array fashioning the mountains, extending the domain of the sea, tracing valleys for rivers to flow in, and grinding the rocks to soil for fertile fields for the use of life to come.

Through the afternoon the day grows in beauty. The air seems

to thicken without losing its fineness, and everything settles into deeper repose. Then comes the sunset with its purple and gold, blending earth and sky—everything in the landscape in one inseparable scene of enchantment.

During the winter snow falls on the fountains of the glaciers in astonishing abundance, but lightly on the lowlands of the coast; and the temperature is seldom far below the freezing point. Back in the interior beyond the mountains the winter months are intensely cold, but fur and feathers and fuel abound there.

The bulk of the woods is made up of two species of spruce and a cypress. The most valuable of these as to timber is the yellow cedar, or cypress; a fine tree, 100 to 150 feet high. The wood is pale yellow, durable, and delightfully fragrant. The Menzies spruce, or "Sitka pine," is larger and far more abundant than the first. Perhaps half of the forest trees of southeastern Alaska are of this species. The graceful Merten spruce or hemlock is also very abundant. Alaska has but few pines. The hard woods are birch, maple, alder and wild apple, forming altogether a scarcely appreciable portion of the forests. In the region drained by the Yukon the principal tree is the white spruce. I saw it growing bravely on the banks of rivers that flow into Kotzebue sound, forming there the extreme edge of the Arctic forests.

The underbrush is mostly huckleberry, dogwood, willow, alder, salmonberry vines, and a strange-looking woody plant, about six or eight feet high, with limber rope-like stems, and heads of broad leaves like the crowns of palms. Both the stems and leaves are armed with barbed spines. This is the *Echinopanax horrida*, or devil's club; and it well deserves both its names. It is used by the Indians as an instrument of torture, especially in the work of correcting witches.

The ground is covered with a thick felt of mosses, about as clean and beautiful as the sky. On this yellow carpet no dust ever settles, and in walking over it you make no mark nor sound. It clothes the raw earth, logs, rocks and ice warmly and kindly, stretching untorn to the shores of the Arctic ocean.

The whole country is shining with perennial streams, but none of them, from the mighty Yukon, 2,000 miles long, to the shortest torrent rushing from the coast glaciers, has been fully explored. The Stikeen, one of the best known rivers of the territory, is about 350 miles long, and draws its sources from

the northern part of the broad Rocky Mountain plateau, in company with some of the affluents of the Mackenzie and Yukon. It flows first in a westerly direction, then curving southward enters the Coast range, and sweeps across it in a cañon that is about a hundred miles long, and like Yosemite valley from end to end. To the appreciative tourist sailing up the river the cañon is a gallery crowded with sublime and beautiful pictures, an unbroken series of ice-capped mountains, cliffs, waterfalls, lovely gardens, groves, meadows, etc.; while the glaciers pushing forward through the trees vastly enhance its wildness and glory.

Another interesting excursion may be made from Wrangel to the deserted village of the Stikeens. The moss-grown ruins are picturesque, and surprisingly massive and substantial considered as the work of Indians. Some of the wall planks are two and three feet wide, six inches thick, and forty feet long; while the carved timbers that support the ridge poles, and the strange totem poles, display marvelous specimens of savage art. A few good specimens may also be seen at Wrangel. Similar monuments are made by all the tribes of the archipelago. Those of the Haidahs surpass all others in size and workmanship.

While the Cassiar gold mines were being developed, Wrangel was the most important town in the territory, but Juneau is now the chief mining center. Nearly all the gold of Alaska is still in the ground. Probably not one of a thousand of its veins and placers has been yet touched. The color of gold may be found in almost every stream, and hardy prospectors are seeking their fortunes in every direction. Many have already made their way into the vast region drained by the Yukon, and the developments thus far show that this northern portion of the gold belt of the continent is at least moderately rich, and mining may safely be regarded as one of the chief resources of the territory.

From Wrangel the steamer goes up the coast to the Taku glacier and Juneau. After passing through the picturesque Wrangel narrows you may notice a few icebergs, the first to be seen on the trip. They come from a large glacier at the head of a wild fiord near the mouth of the Stikeen. When I explored it eleven years ago I found difficulty in forcing a way up the front through ten or twelve miles of icebergs. My Indians told me they called this fiord "Hulti," or Thunder bay, from the noise made by the discharge of the ice. This, as far as I know, is the

southmost of the great glaciers of the first class that flow into tide water.

Gliding northward your attention will be turned to the mountains of the Coast range, now for the first time near and in full view. The icy cañons open before you as you pass in regular order showing their wealth. Now a bold headland will hold the eye, or some mountain of surpassing beauty of sculpture, or one of the larger glaciers seen directly in front, its gigantic arms and fingers clasping an entire group of peaks, and its broad, white trunk sweeping down through the woods, its crystal current breaking here and there in shattered cascades, with azure light in the crevasses, making you deplore your inability to stop and enjoy it all in cordial nearness. It was from one of these glaciers to the south of Cape Fanshaw that the Alaska Ice company loaded their ships for California and the Sandwich islands.

In a few hours you come in sight of more icebergs. They are derived from four large glaciers that discharge into the heads of the long arms of Holkam bay, or Sum Dum. Never shall I forget the wild adventurous days spent there in the summers of 1879 and 1880.

At the mouth of the Taku inlet you encounter another fleet of drifting icebergs from the grand Taku glacier, twenty miles distant.

On one of my early exploring trips I stopped at an Indian village here and found it deserted. Not a single person was left on guard. For these people are so rich they have little to lose. My Indians said that the inhabitants were away catching and drying salmon. All the Indian villages are thus abandoned at regular periods every summer, while everybody goes to fishing, berrying and hunting-stations, occupying each in succession for a few weeks. Then after the summer's work is done, the winter supply of salmon dried and packed, fish and seal oil stored in boxes, berries and spruce bark beaten and pressed, their hunts after wild goats, sheep and bears, brought to a close, their trading-trips made, and the year's stock of quarrels with the neighboring tribes settled, then, all at home in their big block-houses, they give themselves to pleasure, feasting, dancing, visiting, speech-making, drinking, etc.

The Taku inlet contains many glaciers, one of which belongs to the first-class. It makes a grand display of itself as it comes

down from its lofty fountains into the head of the fiord and sends off its bergs. To see this, one glacier is well worth a trip to Alaska. At the time of my first visit, while I sat in my canoe, among the ice, sketching and watching the birth of the bergs as they plunged from the glorious crystal wall, two Indians, father and son, came paddling alongside, and with a good natured "Saghaya" inquired who we were and what we were looking for in such a place, etc., while they in turn gave information about the river, their village and the glaciers up the main Taku cañon. They were hunting seals, and as they shot away crouching in their tiny shell of a canoe, with barbed spear in place among the great blue overhanging bergs, they formed a picture of arctic wilderness as telling as may be found amid the drifts and floes of Greenland.

After leaving Juneau, where, it is claimed, you may see "the largest quartz mill in the world," the steamer passes between Douglas and Admiralty islands into Lynn canal, the most sublimely beautiful and spacious of all the mountain-walled channels you have yet seen. The Auk and Eagle glaciers are displayed on the right as you enter the canal, coming with grand effect from their far-reaching fountains and down through the forests. But it is on the west side of the canal near the head that the most striking feature of the landscape is seen—the Davidson glacier. It first appears as an immense ridge of ice thrust forward into the channel, but when you have gained a position directly in front, it is shown as a broad flood issuing from a noble granite gateway, and spreading out to right and left in a beautiful fan-shaped mass, three or four miles in width, the front of which is separated from the water by its terminal moraine. This is one of the most notable of the large glaciers that are in the first stage of decadence, reaching nearly to tide water, but failing to enter it and send off icebergs. Excepting the Taku, all the great glaciers you have yet seen belong to this class.

Shortly after passing the Davidson the northmost point of the trip is reached, and at the canning establishments near the mouth of the Chilkat river you may learn something about salmon. Whatever may be said of other resources of the territory—timber, furs, minerals, etc.—it is hardly possible to exaggerate the importance of the fisheries. Besides cod, herring, halibut and other fishes that swarm over immense areas, there are probably more than a thousand salmon streams in Alaska, in some of

which at certain seasons there is more fish than water. Once I saw one of my men wade into the midst of a crowded run and amuse himself by picking up the salmon and throwing them over his head. On rocky shallows thousands could thus be taken by hand in an hour or two.

The steamer now goes down the canal, through Icy strait, and into the wonderful Glacier bay. All the voyage thus far from Wrangel has been icy, and you have seen hundreds of glaciers great and small. But this bay and the region about it, and beyond it towards mount St. Elias is pre-eminently the Iceland of Alaska and the entire Pacific coast.

Glancing for a moment at the results of a general exploration we find that there are between sixty and seventy small residual glaciers in the California sierra. Through Oregon and Washington, glaciers, some of them of considerable size, still exist on the highest volcanic cones of the Cascade mountains—the Three Sisters, mounts Jefferson, Hood, St. Helens, Adams, Tacoma, Baker, and others, though none of them approach the sea. Through British Columbia and southeastern Alaska the broad sustained chain of mountains extending along the coast is generally glacier-bearing. The upper branches of nearly every cañon are occupied by glaciers, which gradually increase in size to the northward until the lofty region between Glacier bay and mount St. Elias is reached. In Prince William sound and Cook's inlet many grand glaciers are found, but farther to the westward, along the Alaska peninsula and the chain of the Aleutian islands, though a considerable number of glaciers occur on the highest peaks, they are quite small and melt far above sea-level, while to the north of latitude 62°, few, if any, remain in existence: the ground being comparatively low, and the snowfall light.

The largest of the glaciers that discharge into Glacier bay is the Muir, and being also the most accessible is the one to which tourists are taken and allowed to go ashore and climb about its ice cliffs and watch the huge blue bergs as with tremendous thundering roar and surge they emerge and plunge from the majestic vertical ice-wall in which the glacier terminates.

The front of the glacier is about three miles wide, but the central berg-producing portion, that stretches across from side to side of the inlet like a huge jagged barrier, is only about half as wide. The height of the ice-wall above the water is from 250 to

300 feet, but soundings made by captain Carroll show that about 720 feet of the wall is below the surface, while still a third portion is buried beneath moraine material. Therefore, were the water and rocky detritus cleared away, a sheer wall of blue ice would be presented a mile and a half long and more than a thousand feet high.

The number of bergs given off varies somewhat with the tides and weather. For twelve consecutive hours I counted the number discharged that were large enough to be heard like thunder at a distance of a mile or two, and found the rate to be one in five or six minutes. When one of the fissured masses falls there is first a heavy, plunging crash, then a deep, deliberate, long-drawn-out thundering roar, followed by clashing, grating sounds from the agitated bergs set in motion by the new arrival, and the swash of waves along the beach. All the very large bergs rise from the bottom with a still grander commotion, heaving aloft in the air nearly to the top of the wall, with tons of water pouring down their sides, heaving and plunging again and again ere they settle and sail away as blue crystal islands; free at last, after being held rigid as part of the slow-crawling glacier for centuries. And strange it seems, that ice formed from snow on the mountains two and three hundred years ago, should after all its toil and travel in grinding down and fashioning the face of the landscape still remain so lovely in color and so pure.

The rate of motion of the glacier as determined last summer by Prof. Reid is, near the front, about from five to ten feet per day. This one glacier is made up of about 200 tributary glaciers, which drain an area of about a thousand square miles, and contains more ice than all the eleven hundred glaciers of the Alps combined. The distance from the front back to the head of the farthest tributary is about fifty miles, and the width of the trunk below the confluence of the main tributaries is twenty miles or more.

I made my first visit to Glacier bay toward the end of October, 1879. Winter weather had set in; young ice was forming in the sheltered inlets, and the mountains had received a fresh covering of snow. It was then unexplored and unknown except to Indians. Vancouver, who surveyed the coast nearly a hundred years ago, missed it altogether, on account, I suppose, of bad weather and a jam of ice across its mouth.

I had spent the best part of the season exploring the cañon of the Stikeen river, and a little of the interior region on the divide of some of the southerly tributaries of the Yukon and Mackenzie. It was getting rather late for new undertakings when I returned to Wrangel, but eagerness to see some of the glaciers to the northward, however imperfectly, drove me on. Assisted by Mr. Young, the enthusiastic Alaska missionary, I succeeded in procuring a canoe and a crew of four Indians—Toyette, Kadechan, Stikeen John, and Sitka Charley. Mr. Young who was anxious to learn something of the numbers and condition of the Indian tribes that might be seen on the way, agreed to go with me. Hastily gathering the necessary supplies, we set forth October 14th. While we were on the west shore of Admiralty island, intending to make a direct course up Lynn canal, we learned that the Chilcat Indians were drinking and fighting, and that it would be unsafe to go among them until their quarrels were settled. I decided therefore to turn westward through Icy strait and go in search of Sitka Charley's wonderful "ice mountains." Charley, who was the youngest of my crew, having noticed my interest in glaciers, told me that when he was a boy he had gone with his father to hunt seals in a large bay full of ice, and he thought that he could find it.

On the 24th, as we approached an island in the middle of Icy strait, Charlie said that we must procure a supply of wood there to carry with us, because beyond this the country was bare of trees. Hitherto we had picked our way by Vancouver's chart, but now it failed us. Guided by Charlie, who alone knew anything of the region, we arrived late in what is now called "Bartlett bay," near the mouth of Glacier bay, where we made a cold camp in rain and snow and darkness. At daylight on the 25th we noticed a smoke, where we found a party of Hoonah seal-hunters huddled together in a small bark hut. Here Sitka Charlie seemed lost. He declared the place had changed so much he hardly recognized it, but I succeeded in hiring one of the hunters to go on with us up the main Glacier bay, or "Sita-da-ka," as the Indians called it. The weather was stormy, cold rain fell fast, and low, dull clouds muffled the mountains, making the strange, treeless land all the more dreary and forbidding. About noon we passed the first of the low descending glaciers on the west side, and found a landing-place a few miles beyond it. While

camp was being made I strolled along the shore, eagerly examining the fossil wood with which it was strewn, and watching for glimpses of the glaciers beneath the watery clouds. Next day the storm continued, a wild southeaster was howling over the icy wilderness, and everybody wished to remain in camp. Therefore I set out alone to see what I might learn. Pushing on through mud and sludgy snow I gained at length a commanding outlook on a bald promontory, about 1,500 feet high. All the landscape was smothered in busy clouds, and I began to fear that I had climbed in vain, when at last the clouds lifted a little, and the ice-filled expanse of the bay, and the feet of the mountains that stand about it, and the imposing fronts of five of the great glaciers, were displayed. This was my first general view of Glacier bay—a stern solitude of ice and snow and raw, newborn rocks, dim, dreary, mysterious.

I held my high ground, gained at such cost, for an hour or two, sheltering myself as best I could from the blast, while with benumbed fingers I sketched what I could see of the stormy landscape, and wrote a few lines in my notebook. Then I beat my way back to camp over the snow-smothered ridges and boulder piles and mud beds, arriving about dark.

Mr. Young told me that the Indians were discouraged and would like to turn back. They feared that I had fallen, or would fall, or in some way the expedition would come to grief in case I persisted in going farther. They had been asking him what possible motive I could have in climbing mountains in such miserable weather; and when he replied that I was seeking knowledge, Toyette remarked that Muir must be a witch to seek knowledge in such a place.

After coffee and hard-tack, while we crouched in the rain around a dull fire of fossil wood, the Indians again talked dolefully, in tones that accorded well with the growling torrents about us and the wind among the rocks and bergs; telling sad stories of crushed canoes, hunters lost in snowstorms, etc. Toyette said that he seemed to be sailing his canoe into a "skookum house" (jail) from which there was no escape, while the Hoonah guide said bluntly that if I was going near the noses of the ice-mountains he would not go with me, for we would all be lost by bergs rising from the bottom, as many of his tribe had been. They seemed to be sinking deeper into dismal dumps

with every howl of the storm, when I reminded them that storms did not last forever; the sun would shine again; that with me they need fear nothing, because good luck followed me always, though for many years I had wandered in higher mountains than these, and in far wilder storms; that Heaven cared for us and guided us all more than we knew, etc. This small speech did good! With smiling reassurance Kadechan said that he liked to travel with fearless people; and dignified Toyette declared he would venture on, for my "wa-wa was delait" (my talk was very good).

We urged our way against ice and weather to the extreme head of the bay and around it, going up one side and down the other and succeeded in reaching all the main glaciers excepting those at the head of frozen inlets.

Next to the Muir, the largest of the glaciers enters the bay at its extreme northwestern extension. Its broad, majestic current, fed by unnumbered tributaries, is divided at the front by an island, and from its long, blue wall the icebergs plunge and roar in one eternal storm, sounding on day and night, winter and summer, and from century to century. Five or six glaciers of the first class discharge into the bay, the number varying as the several outlets of the ice fields are regarded as distinct glaciers, or one. About an equal number of the second class descend with broad imposing currents to the level of the bay without entering it to discharge bergs; while the tributaries of these and the smaller glaciers are innumerable.

The clouds cleared away on the morning of the 27th, and we had glorious views of the ice-rivers pouring down from their spacious fountains on either hand, and of the grand assemblage of mountains immaculate in their robes of new snow, and bathed and transfigured in the most impressively lovely sunrise light I ever beheld. Memorable, too, was the starry splendor of a night spent on the east side of the bay, in front of two large glaciers north of the Muir. Venus seemed half as big as the moon, while the berg-covered bay, glowing and sparkling with responsive light, seemed another sky of equal glory. Shortly after three o'clock in the morning I climbed the dividing ridge between the two glaciers, 2,000 feet above camp, for the sake of the night views; and how great was the enjoyment in the solemn silence between those two radiant skies no words may tell.

That morning we had to break a way for the canoe through a sheet of ice half a mile wide, which had formed during the night. The weather holding clear, we obtained telling views of the vast expanse of the Muir glacier and made many sketches. Then fearing that we might be frozen in for the winter we hurried away back through Icy strait into Lynn canal. We then visited Davidson glacier and the Indian village at the mouth of the Chileat river, where we obtained views of three other low descending glaciers of the same rank as the Davidson. Thence, turning south, homeward bound, we passed the Auk and Eagle glaciers, and battled awhile with the bergs of Sum Dum, narrowly escaping being frozen among them. North of cape Fanshaw we were stormbound nearly a week ere we could visit the great glacier near the mouth of the Stikeen. November 20th we reached Wrangel, and our ice lessons for the season were done.

Next year in August I again set out from Wrangel in a canoe and made more careful examination of the glaciers in Glacier bay, and of many new ones that I discovered during the season, the most noteworthy being those of Sum Dum and the immense glacier at the head of Taylor bay to the west of Glacier bay, in crossing which I encountered some exciting adventures.

Again last summer I spent two months in Glacier bay, mostly on the Muir glacier getting acquainted with its higher fountains, studying the fossil forests about it and the rich and lovely flora of the lower ridges, etc. Fain would I describe the glories of those months in the ice-world—the beautiful and terrible network of crevasses, the clustering pinnacles, the thousand streams ringing and gurgling in azure channels cut in the living body of the glacier, the glorious radiance of the sunbeams falling on crystal dale and hill, the rosy glow of the dawn and sunset, the march of the clouds on the mountains, and the mysterious splendor of the auroras when the nights grow long, etc., etc., etc. But this would require a volume, while here I have only the space to add—Go to Alaska, go and see.