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Publisher: Routledge

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Registered office: Mortimer House, 37-41 Mortimer Street, London W1T 3JH, UK



Scottish Geographical Magazine

Publication details, including instructions for authors and subscription information:

<http://www.tandfonline.com/loi/rsgj19>

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Published online: 27 Feb 2008.

To cite this article: Professor John J. Stevenson (1893) Some notes on South-Eastern Alaska and its people, *Scottish Geographical Magazine*, 9:2, 66-83, DOI:

[10.1080/00369229308732602](http://dx.doi.org/10.1080/00369229308732602)

To link to this article: <http://dx.doi.org/10.1080/00369229308732602>

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SOME NOTES ON SOUTH-EASTERN ALASKA AND ITS PEOPLE.

By Professor JOHN J. STEVENSON.

(With a Map.)

ALASKA is no longer an end of the world; distance is of so little account in these days of railroads and fast steamers, that far-away lands, such as Alaska and Siberia, are almost at our door. A week's travel by rail carries the tourist from New York to Tacoma on Puget Sound; in two, or at most three, weeks more he can visit the wild coast of British Columbia and South-eastern Alaska and return comfortably back to Tacoma; while if he be willing to spend another month, a steam launch will take him from Sitka to Oonalaska, and give him full opportunity of seeing the Aleuts in all their native unattractiveness. The excursionist to Sitka visits the Muir and Taku glaciers, and catches glimpses of many others; but he who takes in addition the Oonalaskan trip has the advantage of seeing, even though he may not explore, the noble glaciers of the Mount St. Elias group, and others beyond, with which Russell and Hayes have made us familiar.

The ready accessibility of South-eastern Alaska is due to the great expansion of commercial interests within the last decade; immense canneries have been established at many localities where salmon, cod, and halibut abound; mining for gold and silver, though only recently begun, is already important; and the Indians have shown an unexpected readiness to adopt the ways of civilisation: while those living in British America, away from the coast, have proved themselves thoroughly capable of making good bargains. The insignificant population of Alaska provides business for two large steamers throughout the year, while during the summer a third steamer makes two round trips each month. Thus Alaska is no longer an unknown land, and we are not now dependent on the indefinite statements made by early voyagers or on the records of the old Russian priests. Dall, Elliott, Russell, Hayes, Reid, and Wright have explored different parts of the region during late years, and have told of its people, its seals, and its glaciers. Comparatively little is known with certainty respecting its mineral resources, but prospectors are abroad in the land, and their discoveries will render a careful geological study necessary.

The route from Tacoma, in the State of Washington, near the head of Puget Sound, is practically inland, following the longitudinal bays, and winding among the islands which form an almost continuous archipelago from the Strait of San Juan de Fuca to Glacier Bay. Open sea is crossed at but few places, Queen Charlotte Sound, sixty miles wide, Milbank Sound, about ten miles, and Dixon's Entrance, about twenty miles, being the most serious; but short as these distances are, they suffice for susceptible passengers. Usually, however, Queen Charlotte Sound is crossed at night, when sleep renders passengers less liable to sea-sickness.

The rapid growth of cities on the west coast is exemplified by three towns on Puget Sound. Tacoma and Seattle are less than a score of

years old; yet in many ways they already resemble cities of thrice their age. Tacoma, consisting of a closely built central town and several offshoots out in the woods, embraces an area almost six miles square, and has broad streets on which millions of dollars have been expended for grading and plank-covering. It has been laid out with strict regard to the needs of future generations; the corporate limits are extensive and a proper eagerness to lay out lots and sell them is manifested by every person in the city. The readiness with which old settlers offer to make sacrifices to gratify the speculative stranger is really charming. Electric railways connect the centre and the suburbs, so that all parts of the area are reached with ease. Seattle was destroyed by fire a few years ago, and the new buildings are of a better type than the old, so that this city impresses one more favourably at the first glance than Tacoma. These cities are energetic rivals; each is the greater in the estimation of its citizens, who predict a less brilliant future for the other. A still more notable town is Anacortes, almost on the line between Washington and British Columbia, which has grown more rapidly than the removal of tree-stumps has advanced. It is an admirable specimen of the city *in posse*. The forest has been cut down, streets have been laid out and, to some extent, graded; houses have been built in clusters, separated by long intervals of stump-covered ground. Some of these buildings are imposing in size and architecture, and are strangely out of place amid a wilderness of stumps. But let no one think or speak slightly of Anacortes; within ten years it may be the great rival of Tacoma, Seattle, and Victoria.

Victoria, the capital of British Columbia, on Vancouver's Island, is an attractive city; the moist climate makes it, like Portland, Oregon, a city of roses. The grounds about the houses are fragrant and beautiful, for the shrub-like bushes are covered with a profusion of blossoms, astonishing to one accustomed only to eastern scenes. This city, like all others on the Pacific coast, has its Chinese quarter, where joss-houses and theatres are equally conspicuous, just as in white men's cities churches and theatres rival each other in magnificence. Nanaimo, about fifty miles north of Victoria, is a small town, dependent on the well-known coal mines there and at Departure Bay, three miles further north. The coal from these mines is shipped to all parts of the Pacific coast, being far better than any thus far discovered in the States of Washington, Oregon, or California. The beds are of no little interest to geologists, in that many years ago they yielded fossils, which showed that a flora of well-marked Tertiary forms accompanied a characteristic Upper Cretaceous fauna—a fact which proved of great importance during the discussion respecting the relations of the Laramie group, now accepted as Cretaceous, though long regarded as Tertiary.

The Gulf of Georgia intervenes between Vancouver's Island and the mainland. Northwards it is broken by islands, and the steamer route follows Discovery Passage, where the tourist first makes acquaintance with the causes which render the steamer's movements uncertain, and subsequently is not surprised at the captain's apparent dilatoriness. Seymour's Narrows, barely half a mile wide, form a part of the passage; the channel

is deep enough, but very narrow, and jagged rocks project into it on both sides. Like several other straits and narrows along the route, this one can only be passed safely at slack-water, as the opposing currents cause whirlpools so strong that a steamer cannot be controlled with certainty. A very slight deviation from the course carries a boat on to the rocks, as happened to the U.S. steamer *Saranac*, which was wrecked in these narrows a score of years ago. The narrowness of the strait has suggested the construction of a railway-crossing here, as there are similar narrow straits to the east which can be bridged. The engineering difficulties are not great; the question of profit is more material.

Thence to Queen Charlotte Sound the steamer-route is through narrow channels. On the eastern side great fiords reach inland, exposing rugged mountains to view as far as the eye can see; the Cascade range is broader than in California and Oregon, and no plain intervenes between it and the ocean. The Vancouver coast is almost equally inhospitable, the mountains rising sharply, and in many places almost precipitously, to a height of more than a thousand feet. Further north, snow becomes more abundant, and waterfalls, rivalling in height those of the Yosemite, are of frequent occurrence. The type of scenery is practically the same throughout the voyage, so that, in spite of its grandeur, it becomes occasionally a little monotonous; there is an unbroken succession of mountains rising abruptly four or five thousand feet from the water's edge; of precipitous, or even overhanging cliffs, two thousand or more feet in height; of magnificent amphitheatres in which glaciers had their origin aforetime; and of long fiords where neither glaciers nor icebergs are any longer to be found. The mountains have a dense covering of cedars, firs, and spruces, among which one sees great numbers of dead trees. The destruction is said to be due, not to forest fires, but to lack of nourishment. The struggle for existence on the scanty soil is so severe that the older trees cannot maintain themselves against the younger, which form the dense undergrowth. Whether this explanation be consistent or not, must be left for others to decide.

The excursion steamer stops first at Wrangel, about one hundred and fifty miles north of Portland Channel, the boundary between British Columbia and Alaska, and not far short of six hundred miles north-westward from Victoria. There, in N. lat. $56^{\circ} 30'$, is a straggling settlement, which was of some importance during the Russian occupation, but has since declined. It is situated on the island of the same name, almost opposite the mouth of the Stickeen river, and is the source of supply for stations along that river; for there is still some trade with the region lying behind the Cascade range. For the present, however, little is doing, and the commercial prosperity of the place depends chiefly on the new industry of victimising tourists, which has grown up within the last half-dozen years; it has been very successful, as the steamers are crowded with passengers, who, for the most part, goodnaturedly agree with the Indians that they are legitimate game.

The Stickeen glacier is the first, or most southerly, of Alaska's great ice-streams; but as it fails to reach the mouth of its inlet, it lies beyond the range of the tourist. Ice is seen only after the narrow and treacherous

Wrangel Strait has been passed and Frederick Sound reached, into which it descends from the Baird, Le Conte, and Patterson glaciers, and is readily distinguished from the steamer. Thenceforward, glaciers are a common feature in the distance, but none is approached until the steamer comes to the head of Taku inlet to secure a supply of ice. There the Taku and Norris glaciers come down to the water's edge; the latter, known to tourists as the "Mud glacier," is covered with *débris* for a long distance, and its broad, rounded, gently sloping foot spreads out over a mud-flat, which protects it from the waves. Taku glacier, on the contrary, comes down directly into the water and presents a magnificent terminal wall not less than 250 feet in height and more than a mile in width. Many fragments break away from this glacier, but they are only of moderate size and seldom float as far as the mouth of the inlet.

Douglas Island, almost directly opposite this inlet, is now well known because of the Treadwell gold mine, which, despite the poverty of its pyritic ore, pays enormous dividends. The average yield is but four dollars per ton; yet so cheaply is the ore mined, crushed, concentrated, and treated, that the whole cost from the first blow of the hammer to the extraction of the crude bullion is but one dollar and a half per ton. An immense mill, with two hundred and forty stamps, crushes upwards of seven hundred tons of ore daily; the mine itself is merely an enormous quarry, and mining costs comparatively little money or skill. Juneau, on the mainland directly opposite the Treadwell mine, is a mining town of, perhaps, thirteen hundred inhabitants, most of whom are living by discounting the future rather than by utilising the present. The silver mines are still only "prospects," but specimens of great richness are almost as abundant as prophets of the coming magnificence of Juneau. Gold-mining, confined to placers, has proved reasonably remunerative when pursued on a large scale. Such work is carried on to greatest advantage in summer, when twilight continues all night (Juneau being in latitude 58°), whereas during the winter the working day is very short.

Lynn Channel, only a few hours' sail northwards from Juneau, is formed by the union of the Chilcat and Chilcoot inlets at its northern extremity. The Davidson glacier, entering Chilcat inlet from the east, in N. lat. 59°, has its origin very near to one branch of the Muir glacier, and is said to be not much inferior to it in size. All who have seen the scenery along the shores of this channel regard it as grander than that on any other portion of the route, but a dense fog obscured it and the Davidson glacier from our view. Rounding a peninsula in Icy Strait, one comes to Glacier Bay, which ends at the north in two inlets; the one at the east receives Muir glacier; the other at the west receives the Pacific; while further southward, on the west side of the bay, are other glaciers entering by broad passages.

Muir inlet, between four and five miles long, is somewhat more than a mile and a half wide at its head, this being also the width of the ice wall. The moraine, consisting of more or less imperfectly stratified gravels, underlying coarser and angular material, forms the shore. This deposit extends southward fully four miles on the western side, where

the shore-line is almost straight, but it ends at little more than two miles on the eastern, where the width of the gravels diminishes rapidly. Argillite forms the mountain overlooking the terminus of the glacier, but, as shown by Mr. Cushing, this argillite is overlaid by a limestone, which forms the shore, as well as the islands, of Glacier Bay. The "Dirt glacier" or first eastern tributary of the Muir must head up against an outcrop of this limestone, for one of the passengers on our vessel picked up a form like *Acervularia*, which, taken in connection with some *Leperditia* obtained by Mr. Cushing¹ in 1890, tends to show that the limestone is not younger than Middle Devonian. No clew to the age of the argillite has been obtained.

The main stream of the Muir glacier comes down directly into the inlet, where its wall is 250 feet high, or almost 300 feet to the top of the highest pinnacles. The depth of the water at one hundred yards from the ice, as measured by Captain Carroll of the steamship *Queen*, is 720 feet, so that the thickness of the ice sheet at the terminus is not far from 1000 feet. The ice wall is not uniform in tint; the upper portion, where the surface is irregular, having been thawed and refrozen many times, is milky white, but the lower portion, where contact with the water keeps the surface smooth and solid, is of a beautiful blue. Many of the fragments seen floating in the bay exhibit the same contrast. No enormous bergs were seen, the largest being not more than 300 feet long and 25 feet high; the water is not deep enough to float large bergs. Of those which do break away, the larger are soon stranded, for the bay seems to be shallower than the inlet, and only the smaller pieces reach Icy Strait.

The Muir glacier sends out wings on each side; perhaps it would be better to say that, as the waste of ice is more rapid in the water, the glacier extends further along the shore than it does in the inlet. The western side was not examined by the writer, but the prolongation of ice on the eastern side is very distinct, and projects certainly a third of a mile beyond the main body; Mr. Cushing² photographed it and described it in his discussion of the glacier. This prolongation rests on gravels in which peat occurs and which enclose a buried forest, the stumps of the trees being visible on this side of the inlet only at very low tide.

The tourist reaches the ice from a landing on the east side, near the cabin which has been occupied by the several exploring parties who have visited the glacier. The trail rises quickly to the top of the bluff overlooking the inlet, and follows its crest; for between this crest and the argillite mountain is the valley of a glacier stream, which enters the inlet about a mile below the foot of the glacier. As the moraine material is coarse and the rocks sharp, the journey is difficult, but yielding to the temptation to seek an easier path, the pedestrian invariably comes upon a quicksand. Hereafter, this laborious tramp of nearly two miles will be greatly shortened by a board walk—another illustration of the modern methods whereby science is made easy. The passage from moraine to

¹ *National Geographic Magazine*, vol. iv. p. 59. 1892.

² *American Geologist*, vol. viii. p. 220, pl. III. 1891.

ice is imperceptible, the first indication of the latter being a crevasse, or the rumbling of an underground stream. But, at barely two miles¹ from the landing, one stands on ice and has from a certain spot a view of the several branches or tributaries, as well as of the main glacier itself which comes down from the north-west.

The ice appears to be less crevassed on the eastern side, and several of the passengers who examined the glacier for several miles in that direction reported no difficulty, which accords with the observation reported by Dr. Reid² and Mr. Cushing.³ But near the foot of the glacier and towards the north-west, the crevasses, as seen from a pinnacle, extend over a great area. Dr. Reid found these crevasses shallow.

The only systematic attempt at mapping this glacier and its tributaries was that made by Dr. Reid and his associates in 1890; they estimated the surface of the ice at three hundred and fifty square miles, and the drainage area at not far from eight hundred square miles. The geography of the region beyond this area is not known in detail; but there seems to be no reason for doubting that at least one of the eastern tributaries has its source close to that of Davidson glacier, while the main glacier must originate very near to the sources of the Pacific glacier, which enters the western inlet of Glacier Bay, and is said to be the finest of all the glaciers south of those of the Mount St. Elias range, recently described by Russell.⁴

The movement of the Muir glacier was determined by Wright⁵ to be from forty to seventy feet per diem; but his determinations were based on observations of pinnacles. Dr. Reid⁶ made more detailed and extended observations by means of stakes, and concluded that the maximum movement along the central line is not far from seven feet per diem. In spite of this rapid advance along the centre of the glacier, the ice front is retreating rapidly. From 1886 to 1890 it receded more than one thousand yards, as determined by a comparison of photographs taken by Wright and Reid in these years; and it was ascertained by Captain Carroll of the steamship *Queen* that the recession continues. More than this; at the line where the ice front of 1890 stood, Wright found the top of the ice, in 1886, to be 408 feet above the inlet, but when measured by Reid the height had diminished to 250 feet. The height of the wall is now approximately the same as when measured by Reid, though the front has receded many yards. The great loss along the front is sufficiently evident to the most careless observer, for immense falls of ice occur at brief intervals, and the formation of crevasses or the separation of masses is a common feature, as proved by the thunderlike noises heard within the ice at a short distance from the front. The rapid loss of mass at points removed from the inlet is shown,

¹ The distance as given may be too great, but it is thus reported by the officers of steamship *Queen*.

² *National Geographic Magazine*, vol. iv. pp. 30, 31.

³ *American Geologist*, vol. viii. p. 209.

National Geographic Magazine, vol. iii.

⁵ *American Journal of Science*, vol. xxxiii. p. 10.

⁶ *National Geographic Magazine*, vol. iv. pp. 43 *et seq.*

not only by the contours of Dr. Reid's map, but also by the presence of ice masses, protected by moraine rubbish, on the mountain sides at fully one hundred feet above the present ice surface.

As the islands at, say, twenty miles below the glacier have been found covered with drift, and as Willoughby Island, about twelve miles below, shows well-marked striæ, it is easy to believe that, at no very long time ago, Muir and its neighbour in the other inlet were united and flowed down Glacier Bay, receiving as tributaries from the west the immense glaciers put down on the map as Hugh Miller and Geikie.

Before the glacier began its advance over the gravels, it was certainly much smaller than now. On the eastern side of the inlet, stumps of trees are seen at very low tide, while on the western, between two streams coming down from an old tributary of the Muir, now separated from it, is exposed a buried forest, well described by those who have explored this region. This, however, the writer did not see, as no opportunity was afforded for examination of that side. The gravel on the eastern side contains peat, which certainly is of very recent origin. The wood of the stumps, which is still sound, shows, according to Herrick, a structure closely resembling that of the Sitka spruce, the most common of the Alaska trees. Wright describes the trees on the western side as standing upright, the smaller ones preserving the normal conical appearance of a recently dead cedar. They grew one inch to two feet in diameter in a stiff clay, sometimes twenty feet thick and containing smooth boulders. The streams from the advancing ice must have unloaded their burden in this forest area, and the ice itself followed upon the gravel thus deposited. The date of the advance cannot be very ancient, for the wood still retains its soundness.

Whether the ice had advanced and retreated at any earlier period is difficult to determine from the data now known; but the conditions of the forest suggest that the trees came at least long after glacial action had begun; for, as Wright has shown, the trees grew on a boulder clay sometimes twenty feet thick. Such clay has but one origin, and such a mass required no little time for its accumulation.¹

Leaving Muir glacier and returning down the bay, one sees the Pacific glacier in the western inlet, but the ice-choked channel makes navigation dangerous, and that glacier is not visited. The other glaciers on the western side are rarely seen by passengers on the steamers, as the bay is usually entered early in the morning, and left when the haze of twilight renders a distant view indistinct. The steamer soon reaches Icy Strait, out of which it passes into Chatham Strait, separating Admiralty Island on the east from Chickagoff and Baranoff Islands on the west. The latter islands are separated by the narrow Peril Strait, which deserves its name, for the channel is so tortuous that in one place the

¹ Detailed descriptions of the Muir glacier may be found in *The Ice Age in America*. G. F. Wright. New York, 1889. *Studies of Muir Glacier, Alaska*. H. F. Reid. *Nat. Geog. Mag.*, vol. vi. pp. 19-84. *Notes on Muir Glacier Region, Alaska, and its Geology*. H. P. Cushing. *American Geologist*, vol. viii. pp. 207-230.

The glaciers of the Mount St. Elias region have been described by Russell in the *Nat. Geog. Mag.*, vol. iii. pp. 53-203.

steamer was turned at right angles within her own length in order to pass between the buoys. The passage is made at slack-water and with extreme caution, which does not always prevent an annoying graze upon the rocks.¹

Sitka, the capital of Alaska, is on the western side of Baranoff Island, in N. lat. 57° 02'; its population is much less than that of Juneau, but it is the older town, is the capital of the territory, and enjoys much more clear weather, whereas Juneau is only a mining town, and receives a fourth more rain. Sitka occupies a picturesque position on the incurving shore, behind which the surface rises slowly to form a beautiful recess in the mountains. The harbour, though doubtless attractive to an artist, has few advantages for the sailor; for it is contracted, ingress and egress being alike difficult. The main street of the town passes from the wharf by the old Greek church out to the Presbyterian Mission school. The houses are insignificant, except the Government building and the old Russian castle. The Indian quarter fringes the shore northward from the main street, and compares more than favourably with the other part. In some respects it is more modern, as several of the houses have been built after the most approved methods, while many of the best houses in the other portion are built of huge logs, which have withstood the damp climate for almost a century. Directly opposite Sitka is Mt. Edgecumbe, whose truncated summit tells at once the story of its origin. The mountain is fifteen miles away, but stands out sharply against the western sky as though the interval were but five miles. Its height above the sea-level is about 3000 feet, and, according to Mr. Koosher of Sitka, its crater is not far from 2000 feet in diameter with a maximum depth of, say, 200 feet. The rock is basalt, and perhaps the last eruption took place not very long ago.

The old Greek church in Sitka, which is the most noteworthy relic of Russian occupation, is still maintained by Russian funds; whereby are also supported the missions at St. Michael's, St. Paul's, and other localities in Northern Alaska. The Presbyterian Mission has a large training school, attended by Indians from all parts of South-eastern Alaska, in which are taught trades which can be profitably carried on in this country. The Mission has also a hospital beside its church. It is a liberal institution, for under its shadow and on its grounds has grown up the Alaska Scientific Society, whose museum of Alaskan ethnology is more than interesting; there one finds characteristic work of Eskimo, Aleuts, Athabascans, Thlinkets and the rest, consisting of carving, apparel, and implements of daily life. Geology has not been overlooked, for one finds here tusks and teeth of *Elephas*, as well as specimens of the various ores and minerals. A great part of the collections were made by Rev. Sheldon Jackson, who is now the Government Superintendent of Instruction for the territory. This museum is by far the most interesting institution in Sitka, illustrating, as it does, the differences between the Indians of South-eastern Alaska and those of regions beyond the moun-

¹ It should be called Destruction Strait, for, according to Petroff, it was so designated by the natives, because a large number of Aleutian Indians were lost there many years ago.

tains in British America and the United States. But to this subject we shall refer later on.

The climate of South-eastern Alaska, between $54^{\circ} 40'$ and $58^{\circ} 10'$ N. lat., is a source of constant surprise to visitors from the Atlantic slope. It is true that Wrangel, at $56^{\circ} 30'$, is but a few miles north of Edinburgh; that Sitka, at 57° , is more than ten miles south of Aberdeen, and that Juneau is twenty miles south of Pentland Firth; but on the Atlantic coast of North America, the same parallels pass through bleak and dismal Labrador, while on Hudson's Bay, at 57° , lies Fort York, where the summer heat penetrates but a few feet below the surface. Yet, on this west coast trees grow three thousand feet above the sea at Wrangel, and up to the mountain tops at Juneau. The rainfall is great, amounting to one hundred and three inches at Juneau, though it is less at Sitka, directly on the ocean. The variation in temperature is not great; the mercury rarely falls below ten degrees above zero at Sitka, and as seldom rises above seventy-five degrees. Of course, the extremes are much greater on the mainland beyond the mountains, where the summer heat and winter cold are much more intense than immediately on the coast. Alaska has not been an unprofitable investment for the United States; its purchase secured the goodwill of Russia at a critical period in American history, and the purchase-money has been repaid, or nearly so, by royalties on seal fishing. But the agricultural capabilities are limited indeed; there is little land fit for tillage; and the moist summer with its low temperature is unfavourable to the ripening of grain. Gardens, however, are successful at Sitka and Wrangel, and the commoner vegetables are raised without difficulty. Berries of many kinds grow luxuriantly, and the coast Indians collect abundance of whortleberries, blackberries, and other familiar kinds for use in winter.

This remarkable contrast between the Atlantic and Pacific coasts of North America is due to the influence of the Kuro Siwo, or great Japanese current, which is similar to that of the Gulf Stream upon the west coast of Europe. And there are many points of resemblance between the two streams. The Japanese current is divided by a cold northern current at about N. lat. 38° and E. long. 150° , and fogs are produced by the contact, as they are when the Gulf Stream meets the Labrador current in the north Atlantic. The Kamschatka or northerly branch flows into Bering's Sea and passes through Bering's Strait into the Arctic Ocean, first striking the coast of Northern Alaska: the mild climate of that coast is due to it, and possibly its influence on the ocean temperature has much to do with the presence of fur-seals in Bering's Sea. The main body of the stream crosses the ocean and reaches the American coast not far from the straits of San Juan de Fuca, whence it flows southward to join the Great Northern Equatorial Current off Lower California. Many years ago, a junk with a cargo of beeswax was wrecked at the mouth of the Columbia river, and to this day pieces of the wax are thrown on the shore during severe storms. In 1833, a Japanese junk was wrecked off Cape Flattery, and in the early "sixties," another was found in mid-ocean by an American vessel on which the crew were taken to San Francisco.¹ Distinct proof

¹ George Davidson, in *U.S. Coast Survey Report for 1867*, pp. 202 *et seq.*

of a northerly branch from the main body is wanting; but currents exist along the Alaskan coast the relations of which are perplexing, and would be explained best by the existence of such a northerly branch, with such eddies as must result from the configuration of the coast. It is said that a Japanese junk was blown into Sitka harbour about seventy-five years ago, and there wrecked. Certainly the conditions at Sitka suggest the presence of a warm current not very far off to the west, for the average rainfall during fourteen years was 83.39 inches, the rainy days being 245 per annum. The temperature of the surface water at Sitka during August 1867, was 50.5° F., the temperature of the air averaging 53.4 F.; but in October, when cold water from the snows was coming down, the surface temperature had fallen to 41° F., while that of the air was 44° F.¹ One would hardly expect to find corals here, where the water in October is 27° colder than the water at the Bermudas in April, yet a large *Gorgonia*, fully four feet long, was shown to me by Mr. Koosher of Sitka, who is treasuring it up carefully for the Columbian exhibition; the Indians also offer small fragments for sale. Large starfishes and *trepangs* were lying on the pier when the steamer arrived, while in the water floated great ribbon-like seaweeds, seven or eight feet long and as many inches broad. Here also are *Echini*, five inches in diameter, which occur in such numbers as to be an important article of food for the Indians.

In spite of the superfluity of rainy and cloudy weather, South-eastern Alaska is said to be by no means an uninviting place. In summer the twilight almost meets the dawn, but winter restores the daylight to the general average, for at Sitka lamps are extinguished at nine in the morning, to be relighted at three in the afternoon. The white population, allured by trade or mining, shows great fluctuation, as mining operations, except on a large scale, cannot be carried on during the winter. The number of Whites and "Creoles," or half-breeds, is, as a rule, not more than 2000, though at times it may be exceeded.

Dall² recognises four families of native tribes in Alaska:—the Eskimo or Inuit, the Aleuts or Unungen, the Athabascans or Tinneh, and the Thlinkets, the Koloshes of many English and French writers. The Eskimo and Aleuts, occupying the coast region, are termed Orarians by Mr. Dall, and number about 14,000; the Eskimo, for the most part, are found in the north of the Alaskan peninsula, but the Aleuts extend along the southern shore almost to Bering or Yakutat Bay, directly south of Mount St. Elias. The Athabascans, or Chippewayans, or, as Mr. Dall prefers to call them, the Tinneh, are closely related to the North American Indians of the Rocky Mountains and the plains. They occupy the interior of Northern Alaska along the Yukon river, as well as much of the North-western Territory of Canada, where they approach closely to South-eastern Alaska. But the Eskimo, Aleuts, and Athabascans rarely visit South-eastern Alaska. It is possible that some of the "blanket" Indians seen at Juneau may be Athabascans, for certainly not a few of them had features unlike those of the Thlinkets working on the wharf at that place.

¹ Davidson, *loc. cit.*

² W. H. Dall. *Contributions to North American Ethnology*, vol. i. Memoir.

Some of them were said to have come more than one hundred miles to exchange their pelts and to trade with tourists on steamer-day. If they are Athabascans and not Thlinkets, it must be conceded that they are equally keen in making bargains, though they show less good-nature and eagerness to trade.

The Thlinkets occupy the whole of the Alexander archipelago (in South-eastern Alaska), as well as the mainland from Yakutat or Bering Bay to Portland Inlet, the southern boundary of the territory. Though distinctly one people, having the same physical characteristics and speaking the same tongue or closely allied dialects, they are divided into several tribes, which seem to regard themselves as independent in origin. The Yakutats occupy the narrow coast area from Yakutat Bay almost to Cross's Sound or Icy Strait. The Chilcats dwell at the head of Lynn Channel, their chief village being several miles to the north of the head of that bay; they hold themselves aloof from the Whites except for commercial purposes, and resent any intrusion upon their village. The Sitkans occupy the large islands of the Alexander archipelago, except the southern portion of Prince of Wales Island, where the Hydahs have some villages. The Stahkin, or Stickeen, tribe occupy the strip of coast from Lynn Channel southward, and are especially numerous at Juneau, Wrangel, and Fort Tongas on Portland Inlet, as well as at some other places along the coast. The Sitkan and Stahkin tribes are divided into sub-tribes, which are generally recognised by the Indians—Sitkan among them seeming to refer only to those living on Baranoff Island, whereas the Sitkans of Chickagoff Island, immediately to the north, are called Hoonah.

The relation of the Hydahs, Haidas, or Kyghani to the other Thlinkets is not fully made out; only a small number of them are found in Alaska, their domain being in Queen Charlotte Island, British Columbia. They are unquestionably the finest of the coast races. Two of them, seen at Sitka, were readily distinguishable from the Sitkan Thlinkets by their more sharply-cut features. The Chimsyan tribe, formerly adjoining the Stickeen Indians on the mainland, occupied the peninsula of the same name, in British Columbia, until their disagreement with the religious authorities of that province led them to abandon their home and to seek another on Mary's Island, just within the limits of Alaska. They are closely allied to the Thlinkets.

Dall's estimate of Alaska's population, in 1879, was that it consisted of 25,704 natives, and 1800 to 3000 of Whites and "Creoles," varying with the seasons of the year. He estimated the Thlinkets at 5550, the Hydahs at 300. In 1880, the census agent, Mr. Ivan Petroff, who has given us one of the best descriptions of Alaska, divided the Thlinkets into eleven tribes with a total population of 6347.¹ This subdivision is more in accordance with the native practice than that of Mr. Dall, though the latter may represent the actual relationship. Mr. Petroff found 788 Hydahs. The number of Thlinkets seems to have changed little since it was first estimated in 1819.

¹ *Tenth Census of the United States. Report on the Divided Population, Industries, and Resources of Alaska.* By Ivan Petroff, Special Agent.

The Thlinkets are of medium height, with well-built and sturdy frames; they are dark, not coppery; the hair is black, stiff and straight; the beard is not abundant; the face is broad and often heavy at the base so as to give an inverted egg-shaped oval; the features are distinct and the cheekbones prominent; the lips are full and, among the women, pierced for the labret or *kolosh*; the oblique eye of the Mongol is not rare. These people are warlike in disposition, and strifes between the tribes were of frequent occurrence prior to the Russian conquest. The Russians found much difficulty in gaining a permanent foothold. Old Sitka (New Archangel) was founded in 1799; but very soon afterwards several thousand Sitkans surprised and put to death all the garrison, except a few Russians and Aleuts who were absent when the attack was made and afterward escaped on an English vessel. At about the same time, the settlement on Yakutat Bay was destroyed by the Yakutat Indians; while hunting parties under the leadership of Russians were cut off at many places. But the indomitable Baranoff, the Russian company's agent, soon overcame the Indians and built another New Archangel on the present site of Sitka. No serious difficulty occurred again until 1855, when Sitka was attacked and a conflict ensued which lasted several days and ended in the overthrow of the Indians. Troubles sprang up again when the United States obtained possession of Alaska; but they were in a great measure due to ignorance of the people's habits, and still more to too much haste in acting upon rumour. Since the last collisions, in 1878, a war-vessel has been kept in Sitka harbour; its presence, as well as the great change in the people due to missions and to association with Whites, has prevented further disturbances.

Living in an archipelago, where the islands are as rugged and mountainous as the coast itself, with little fertile land and with a climate not favourable to agriculture, without cattle or places to keep them, the Thlinkets are necessarily hunters and fishermen. The waters of the Alexander archipelago, to the very head of Lynn Channel in N. lat. 59° 10', are full of salmon, cod, halibut, and other edible fish; the mountains on the islands and the coasts teem with bear, deer, mountain goat, and other animals which yield food and clothing; while berries of many kinds grow luxuriantly near the shores. It is not surprising that when these people were discovered by white navigators they were called sluggish and indolent. It has been said that most men are as indolent as circumstances permit; but considering their rapid development, it may be concluded that the Thlinkets of olden time were as industrious as their circumstances permitted. The Thlinket canoes were, and still are, marvels; they are hewn from a single cypress log, and are often ornamented after a wonderful fashion. One of ordinary size holds six persons, but the war boat accommodates fifty. Ordinary boats are numerous at Sitka, where they are drawn up on the shore and in most cases covered carefully.

One who has seen the canoes is not surprised to find the Thlinkets excelling in carving of all sorts; those at the north have only wood and bone on which to exercise their skill, but the Hydahs of Queen Charlotte and Prince of Wales islands have a black slate, which when taken from the quarry is soft and easily worked, though afterwards it becomes

exceedingly hard. The slate carvings, mostly models of *totem* poles, are in no wise attractive from the beauty of the subject, but are striking examples of skill in treatment of material. The Thlinkets proper make odd carvings in bone; imitations of the human face on pipes; weird masks in both bone and wood; elaborate carvings on walrus tusks, which are far from devoid of beauty, while they attract attention by the delicacy of manipulation, though there may be little delicacy in the subject. The horn of the mountain goat affords material for spoons with carved handles which never fail to find a purchaser in the tourist. Silver coins are hammered into bracelets or spoons, which are then chased with a pocket-knife. Basket-work is carried to a high degree of excellence by the women, especially among the northern Thlinkets, the finest being that of the Yakutatats. The baskets, made from the cypress root and coloured with home-made dyes, are so pliable that they can be packed flat in a trunk, are very durable, and are so close as to hold water. Yet this last statement does not always hold good, for the tourist trade has become so extensive that baskets of less compact texture are not unknown. But those of the best manufacture are water-tight, and it is said that if heated stones be thrown in, the water can be kept hot long enough to cook ordinary vegetables without injuring the basket in any way. The Chilcat women weave blankets from the hair of the mountain goat, which in closeness of texture rival the more celebrated blankets of the New Mexico Navajos. These are embroidered after the weaving is completed; the colours are brilliant, but are so skilfully arranged that they are not displeasing. As an industrious woman requires about six months to manufacture a blanket, the price—about seventy-five dollars—is by no means exorbitant.

The most ponderous examples of Thlinket carving are the huge *totem* poles, which tell the owner's genealogy. Such poles were seen in front, or alongside, of many dwellings in villages of British Columbia and Prince of Wales Island near which the steamer passed; but in Wrangel, where the steamer first stopped, they are far less numerous, and most of them are decayed, so that they are not likely to weather the storms of many more winters. The Hydahs of Queen Charlotte Island had great numbers of them a few years ago in some villages—"at least two carved posts for each house, and these, when the village is first seen from a distance, give the aspect of a patch of burnt forest with bare bristling tree-stems."¹ The Hydahs excel all the rest in the quantity and artistic character of their carvings; the stone *totems* made by them are simply models or copies of some of the large poles. The Chimnsyan Indians, after their conversion to Christianity, cut down their poles. The Wrangel poles are amusing rather than interesting; the most grotesque is that surmounted by a human effigy wearing the ordinary chimney-pot, or stove-pipe, hat. Carved posts were seen in the Indian village near Juneau, but they are certainly rare in Sitka.

These posts have a connection with the totemic or clan system prevailing among the people of this coast. The Yakutat Indians² are said to

¹ G. M. Dawson. *Geol. Surv. of Canada; Rep. of Prog.* 1878-9, p. 116 B.

² Dall, *loc. cit.* p. 37.

deny the existence of the system, nor does Dr. Dawson¹ refer to it in his description of the Hydahs already quoted; but it certainly prevails among the Thlinkets of the Alexander archipelago, as well as many other North American tribes. Powell² has discussed its existence among the Wyandots, while its characteristics among the Omahas have been described by Dorsey.³ Two, possibly four, great clans exist among the Thlinkets—the Wolf and the Raven, the Bear and the Whale. Doubtless there are others, but these appear to be the most prominent, and their *totems* are most frequently found on carved posts and pipes. A Hoonah pipe in sandstone has them all. The bond of the clan is much closer than that of blood, for marriage is exogamous and the child belongs to the mother's clan. A man belonging to the Wolf may not marry within his clan, but must seek his wife from the Raven or some other clan or *gens*. The child may not marry within his mother's clan, but may into that of his father, as its members are not his relatives.

The lot of women among the Thlinkets is far from enviable; it is true that Holmberg, as quoted by Westermarck,⁴ asserts that the suitor must consult the wishes of the young woman, but Petroff⁵ says that, when a Thlinket youth has found a maiden to his liking, he sends a messenger to her parents, or to the nearest relative, with the proposal. If the answer be favourable, he presents to the prospective father-in-law all the valuables that he can procure, honestly or otherwise, and soon follows in person. The wedding day is fixed and the marriage is celebrated with a costly feast lasting four days. This statement, which accords with the information received by the writer, shows that the woman's consent is not an important element in the case. The husband has the right at any time to send back the wife to her parents, returning the dowry with her; but if she prove unfaithful, he may, upon discarding her, retain her dowry and demand the return of his presents. In case the marriage is dissolved by mutual consent, the dowry and presents must be returned. Polygamy or polygyny is permitted, but the first wife remains head of the household. Veniaminoff is quoted by Westermarck⁶ to show that polyandry existed; that in former times a Thlinket woman could have, besides her husband, a legal paramour, usually the husband's brother. Petroff⁷ in quoting also from Veniaminoff, says that the "assistant husbands" are maintained by the wives, and are husbands only when the true one is absent; at other times they are servants, hewers of wood and drawers of water.

Be this as it may, the condition of the Thlinket women after marriage is much worse than before. The effects of cruel treatment are sufficiently evident; while the carriage of the men is erect, that of the women is clumsy and uncertain, becoming more so with advancing years. As the period of parturition approaches, the woman is driven from the house

¹ G. M. Dawson, *loc. cit.*

² J. W. Powell. *First Rep. Bureau of Ethnology*, 1879, p. 59.

³ J. O. Dorsey. *Third Rep. Bureau of Ethnology*, 1881-82, p. 211 *et seq.*

⁴ Westermarck. *The History of Marriage*, p. 215.

⁵ *Report on Alaska*, p. 169.

⁶ *Loc. cit.* p. 169.

⁷ *Loc. cit.* p. 450.

and is compelled to find or make shelter for herself in the woods, no matter what the season may be. There, without assistance, she must undergo her suffering, usually amid rain and snow—an exposure often fatal alike to mother and child. The pitiable condition of the native women at Sitka induced Dr. Clarence Thwing,¹ in charge of the Presbyterian hospital at Sitka, to open a Maternity Home, where the women could find shelter in their need. Its necessity was promptly proved by the service it rendered in relieving almost a score of women.

The burial ceremonies of the Thlinkets are simple. Formerly cremation prevailed, being practised on all except the *Shamans*, who received, in many instances, scaffold burial. Now, however, under the influence of civilisation, cremation is less frequent, and one sees at Juneau and Sitka various forms of house and tent burial. Until very recently, custom required the sacrifice of one or more slaves when a well-to-do Thlinket died, in order that he might not be companionless. The poor dispose of their dead quietly by cremation or burial, but a great funeral feast is expected after the death of a wealthy man. Preparations for a grand wake were being made at Juneau when our steamer put in, but we left before the solemnity began. The heir is a sister's son or, in default, a younger brother, whose first duty is to marry the widow; this so-called *Levirate* is enforced so rigorously that a refusal to comply with the custom leads to serious disputes—in some cases to tribal war. Not long ago, a bright lad in the Sitka Mission school became heir to a deceased relative, and was promptly claimed by the widow, a woman of advanced years. The Mission authorities refused to deliver him up, thereby causing a disturbance so great and so threatening, that the boy's freedom had to be purchased with a considerable sum of money. If there be no near relative, the woman is not compelled to remain in widowhood; she may choose a mate from some other clan.

The killing of slaves at the death of a rich man is evidence that the Thlinkets believe in continued existence after death; but there is difficulty in obtaining any very definite statement respecting their original beliefs. The well-known disposition of savages and untutored people to give to questioners the kind of information supposed to be gratifying, explains the puzzling contradictions between statements made by missionaries and those made by travellers who are not in search of information to support or to overthrow any definite theory. This difficulty no longer presents itself in Alaska, as the converted Thlinkets do not hesitate to give, as far as possible, true statements respecting the religious beliefs of their race. The most serious difficulty is that experienced in the case of the trans-Mississippi tribes; they have been so long in contact with one form or another of Christianity that traces of Christian legend creep into their myths. It is sufficiently clear, however, that *shamanism* lies at the basis of their beliefs, and their legends deserve a

¹ Of course this refers only to the unchristianised Indians; among the others the condition of women is altogether different; they enjoy well-defined and recognised rights. The wealthiest Sitkan is the "Princess Tom," whose wealth in blankets, furs, and articles of vertu is estimated at from \$20,000 to \$45,000. Her skill as a trader is freely conceded by all tourists.

place in folk-lore rather than in the records of religion. The Thlinket universe is peopled with spirits good and evil, with which the *Shaman* is at least *en rapport*, over which, possibly, he has some control. For the most part, the Thlinket's respect for the spirits is due principally to the fact that they are invisible and so have the advantage of him. When the *Shaman's* services are needed, he brings himself into a semi-trance by abstinence from food, followed by violent gyrations about a fire accompanied by the beating of drums. His utterances in that condition are accepted as coming, not from himself, but from the spirit upon which he has called. When spirits refuse to obey the call, the blame is laid at once upon some person or family, who must suffer a severe penalty. The *Shaman* has a rival in the Medicine Man, who is only a wizard inferior to himself. The physician-sorcerer comes prepared with masks, drums, and rattles, with which to drive away the disease by frightening the evil spirits; but the terrible disturbance often brings the disease and the patient to an end together. The *Shaman's* power is declining. Only a little while ago, a celebrated sorcerer of the Chilcat tribe was defied and his tormentors cut off his hair without suffering any of the threatened ills. At Muir glacier, I purchased from some Chilcats a ring of teeth and bone carvings which had formed part of a *Shaman's* paraphernalia; some Stick-teen Indians, who had come from Wrangel to build the board-walk on the moraine, examined the collection for a few moments and then said that that sort of thing is about done for, as their people have no longer much confidence in the Medicine Men.

The habits of the Thlinkets differ in many ways from those of Indians beyond the coast ranges on the mainland. The houses of those living on the shore, away from immediate contact with Whites, are of massive logs, surmounted by a bark roof, in which a large hole allows the smoke to escape from the fire burning in the middle of the floor. Such buildings were seen at Wrangel, as well as at many other places at which the steamer made no stop. The clothing of these people is abundant enough, but is far from being clean; clothing and houses are for protection, comfort being unknown.

But the Thlinkets are keenly alive to the advantages of civilisation, so that where they are in contact with the Whites they soon become dissatisfied with their condition of semi-savagery. They are quick in perception, and exceedingly open to religious influence, especially if it be accompanied with such instruction as enables them to improve their condition. The remarkable success of Mr. Duncan in converting the whole Chimsyan tribe to a thrifty, industrious Christian people is well known; and the haughty independent spirit of the tribe was manifested when, refusing to be meddled with by the religious authorities of British Columbia, they abandoned their ancestral home at Metla-katla, with its immense church and all their real property, to seek a new home on St. Mary's island just within Alaska. The abandoned Metla-katla is shown to all excursionists, for the steamer's course passes near to the Chimsyan peninsula. The Presbyterian missions at Tongas, Wrangel, Jackson, Juneau, and Sitka have been extremely successful, not only in changing the religious condition, but also, and even more, in changing the social

condition. The mission Indians learned English, were taught trades, and were trained to habits of regular industry. They were employed in preference to others in canneries, on fishing-boats, and as labourers in mines and on the steamer piers. Other Indians, seeing these advantages, promptly tried to imitate those connected with the missions. Comparatively few men now remain in the larger towns during the summer, for excellent wages are offered at many places; but in the long winter there is ample opportunity for the expenditure of wages earned during the summer. The clothing for the most part is like that of the Whites. The houses show a great improvement; instead of the low log houses barely eight feet high, one sees in the towns many good buildings, not of logs but weather-boarded, sometimes two or more stories in height and with bay windows to the top. Such a building was seen at Wrangel, with two great *totem* poles and an alligator in front; while almost the best house in Sitka is the new residence of "Dick the Dude," at the north end of Indiantown. Dick, who is a mission Indian, had held his "house-raising" only a few days before our arrival; the pot-latch, or feast, on that occasion is said to have cost him not less than five hundred dollars. The interior of the houses shows as great an advance as the exterior; instead of clay, one finds plank floors raised above the ground and in many instances provided with blankets or rugs. Not a few of the large houses have no chimney except the opening in the roof, which is usually provided with a movable cover. And these changed conditions exist beyond the immediate reach of missionary influence, largely because of the keen appreciation of comfort, for they are said to be equally marked at the canneries; but it must be remembered that the best workmen at the canneries are the mission Indians, and that the changes there are due to their example.

Thlinket women, whether Christian or heathen, whether they wear blankets or frocks, love dress and ornament. The uncivilised women paint their faces and pierce the lower lip for the hideous labret or *kolosh*. This ornament is seldom more than an inch long and its diameter is that of a large goose quill. The early navigators spoke of it as more than an inch in diameter; but that must be exceptional, for only small labrets were seen at towns where the steamer stopped. The taste exhibited in selection of dress-patterns is quite as startling as that sometimes displayed by white women. A shopkeeper at Juneau showed me a piece of brocaded silk which had been laid aside for a young "blanket" Indian, who wanted it for her Fourth of July dress. The material was too light in colour for hangings, too stiff for upholstering furniture, and hardly heavy enough for a grain bag; but its figures were large, well proportioned and artistic in general design. As a dress it would be a success for an Indian girl; it would fill all rivals with the bitterness of despair.

The future of Alaska is a problem. The seals of the North-west will soon be a thing of the past, like the *Rhytina* of the neighbouring waters; already the diminution apparent this year is bringing consternation to those whose interests depend on the catch; the prospect is that before many years have passed the skin of the fur-seal will bring prices as fabulous as those quoted for the skin of the practically extinct American bison. But the fish supply is incredible; at present it is utilised only at salmon

canneries; but eventually refrigerator vessels and cars with Alaska ice will bring Alaska salmon and halibut into competition, east of the Mississippi, with salmon of the Columbia river and the halibut of the east coast of Canada. The mineral resources have yet to be determined; coal has been found on Admiralty Island, but no definite test of its quality has been applied; gold and silver are mined at Douglas Island and on the mainland near Juneau, while gold in small quantities has been found on Baranoff Island. For the present, however, there is little prospect that, after the seals have disappeared, Alaska will be anything more to the United States than it was to Russia. Its gloomy skies and glaciated shores will prevent agricultural enterprise, while the extreme variation in the length of the day will render difficult any systematic development of mineral resources except on a gigantic scale. In all probability, its chief importance, as already said, will be as a source of fish-supply for a great part of the United States.

NOTES ON THE CONSTRUCTION OF TOPOGRAPHICAL MODELS.

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UNTIL near the close of the 18th century the condition of all the roads leading into the city of Edinburgh was such as seriously to impede the transport of any but the smallest loads. Even where the roads themselves were fairly well paved, the gradients in many places were so steep that the strength of the best draught horses of the day was often taxed to the utmost by the exertion required. The old road from Leith Walk to Newington enables us to form a good idea of the difficulties that attended the transport of heavy goods in the olden times. When this road was planned, the numerous braes on the direct line of route compelled the old road-makers to travel far out of their course, in order to lessen the gradients as much as possible, and to avoid the steep inclines presented by the north and south slopes from the High Street. Even in the height of the coaching days several of the main roads were but little better in this respect, as may be seen, for example, by following the old road to Queensferry where it crossed the Water of Leith. The construction of such viaducts as the Waterloo Bridge, George IV. Bridge, the North Bridge, the South Bridge, and especially the fine bridge on the present Queensferry road where it crosses the dene of the Water of Leith, effected considerable improvements, the importance of which it is very difficult for us to realise fully at the present day.

A year or so ago, Mr. Charles Jenner, F.R.S.E., who has long taken much interest in such matters, conceived the idea of having a topographical model of Edinburgh constructed, with the express object of illustrating