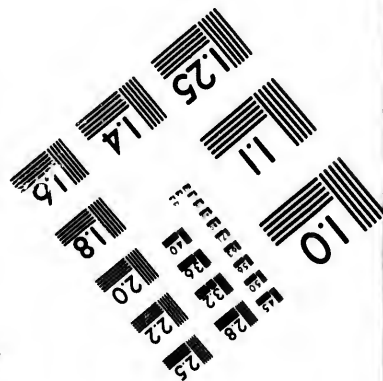
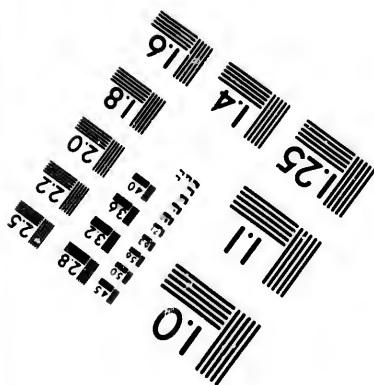
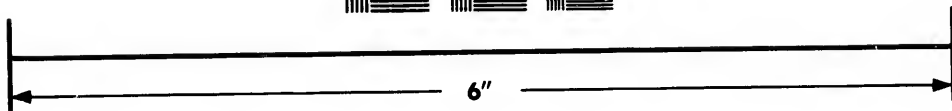
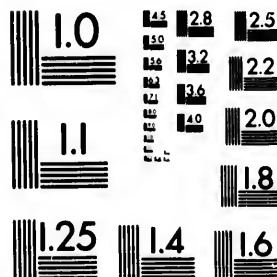


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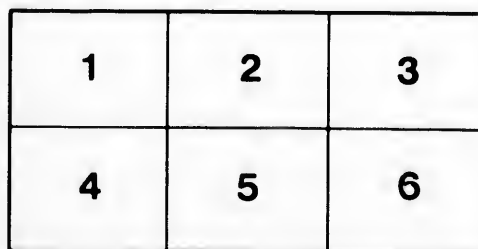
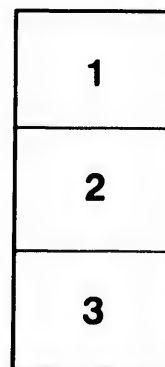
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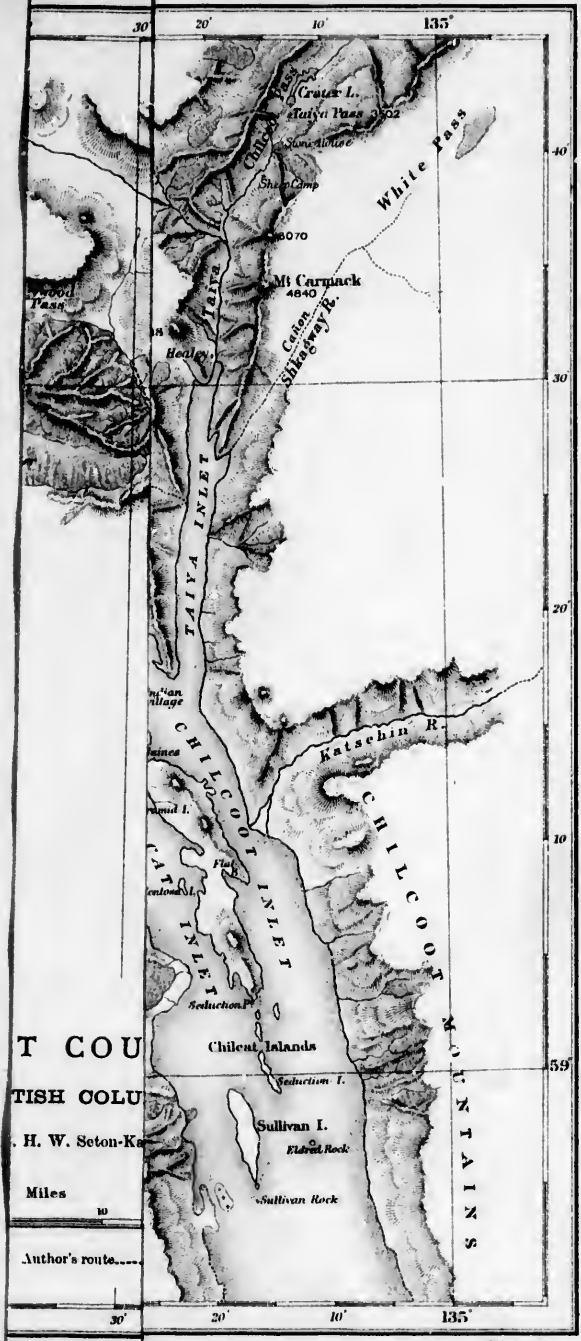
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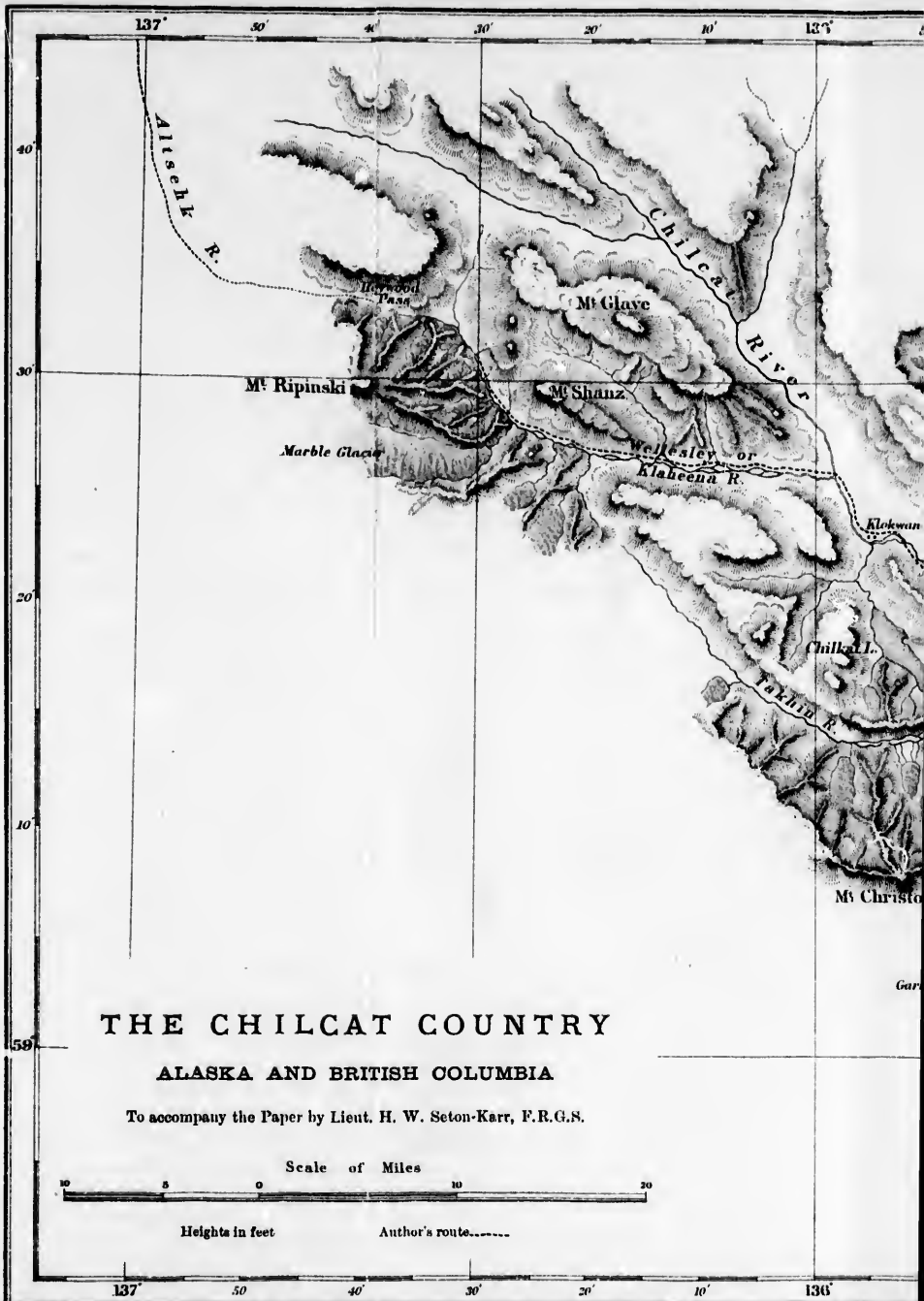
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BRITISH COLUMBIA

H. W. Seton-Kar...

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THE CHILCAT COUNTRY

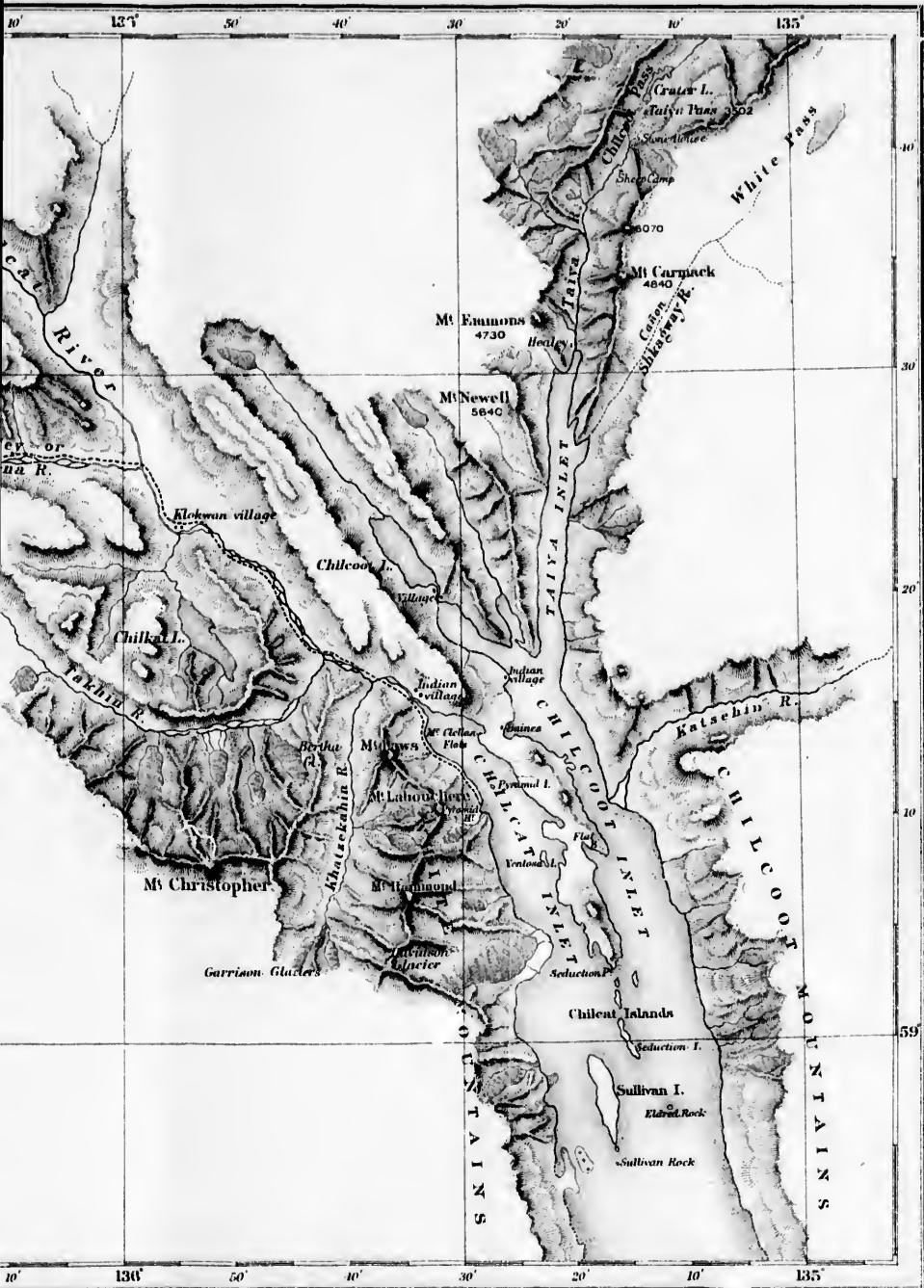
ALASKA AND BRITISH COLUMBIA

To accompany the Paper by Lieut. H. W. Seton-Karr, F.R.G.S.



Heights in feet

Author's route.....



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PROCEEDINGS
OF THE
ROYAL GEOGRAPHICAL SOCIETY
AND MONTHLY RECORD OF GEOGRAPHY.

Explorations in Alaska and North-west British Columbia.

By H. W. SETON-KARR.

(Read at the Evening Meeting, December 8th, 1890.)

Map, p. 136.

SINCE I had the honour of addressing this Society on our explorations of the Saint Elias glaciers in 1886, I have visited many countries enjoying more genial climates, but returned with renewed zest and freshness this summer to Alaska, with the aim of exploring an unknown portion of this sub-Arotio region and a new pass across the mountains of British Columbia, adjacent to the scene of my previous adventures with the New York *Times* expedition of that year.

Mount St. Elias stands isolated, but behind it I saw a galaxy of snow-peaks, a sea of glittering glaciers, a collection of huge pinnacles clothed from head to foot in ice and snow, amongst which I think it doubtful if anyone will ever penetrate for any long distance, owing to the difficulties of transport. In 1888 four members of the English Alpine Club—Messrs. E. H. and H. W. Topham, G. Broke, and W. Williams—ascended to a height of 11,000 feet on the south side of St. Elias, but failed to reach the summit.

I wished this year to ascertain how far this Canadian Switzerland extended inland, and whether there was a land route to Yakutat Bay, as the Indians had told us there was.

How far inland these ranges and glaciers extend yet remains to be discovered, and I will mention later on some reasons why the country in rear of these ranges should prove to be exceptionally remarkable.

This entirely unknown country measures about 400 miles in length and 200 miles in breadth, and the larger part is situated in British territory. I penetrated but a comparatively short distance into its outer rim, the difficulty, besides the natural obstacles met with, being the extortionate demands of the Indians—and their services are indispensable as pack-carriers.

Throughout this expedition we bore the British ensign, a habit which I recommend to explorers. Besides its moral effect, both upon our-
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selves and upon the natives, its bright colours are cheerful in gloomy forests, or on the snow.

The luxurious and pleasurable manner in which this expedition was commenced by a trip north-westwards of nearly a thousand miles amidst an archipelago of islands, served only to throw into sharp relief the hard work and painful methods of travel necessary in order to overcome the obstacles to our advance presented by such a difficult and almost impenetrable country—the rapidity of the ice-cold rivers, the steepness of the damp mountains, the denseness of the forest and brush, and the necessity of looking to the Indians for help—help which is never withheld so long as dollars are forthcoming. So long as there are Indians, travel in these difficult regions of North-western America will be a mere question of money, for with plenty of Indians travel there is easy.

Let me endeavour, in a few condensed sentences, to give you a clear idea of the outward appearance of this portion of the Pacific coast—the Pacific seaboard of the Canadian Dominion. Its geographical characteristics are very marked. Commencing from the south, California, Oregon, and Washington present a plain coast-line to the ocean, with scarcely any good sheltered harbour. This is the case as far north as Cape Flattery, or the Straits of Juan de Fuca, where British territory commences. This is the beginning of that remarkable network of fringing islands which has its counterpart on the coast of Norway and the west coast of South America.

This Inland Passage, as I shall call it, continues northwards past British territory (the Canadian province of British Columbia), and includes the southern arm of Alaska, which is here a narrow strip of coast sheltered by the seaward islands.

At Cape Spencer, the southern projection seawards of the St. Elias Alps, the Inland Passage suddenly comes to an end, and the coast becomes more stern and shelterless than ever; there is only one harbour for vessels, and only about six places where small boats can land.

So much for the general shape and character of the coast-line between the thirtieth and sixtieth parallels of latitude.

The differences of climate in different places are very great, and admit of broad distinctions as regards the mainland of British Columbia. A dry climate, where water is precious and irrigation necessary to agriculture, exists on the landward, eastward, or leeward side of the first main range of mountains—the Cascades; and in a less marked degree this dry zone also exists in a strip on the leeward side of the main range of the Rocky Mountains and on the leeward side of all the ranges. But on the islands, and along a narrow belt of the mainland facing them, there is too much water; the winters are mild and rainy, and more rain than seems necessary falls in summer.

Consequently, vegetation on the coast is very dense: the fir and

cedar reach to a great size, the growth of ferns, plants, and bushes is rich and luxuriant, interspersed with thickets of salal (*Gaultheria shallon*). Inland, on the dry strip, on the contrary, vegetation is thin, the trees are small; and the presence of cacti remind one, at every step, that waterproof and umbrella might as well be left at home.

As regards Puget Sound and Victoria, the rainfall is somewhat lessened by the Olympic range of mountains, which stretches seaward and ends in Cape Flattery, which I before alluded to, so that the summers are dry and the climate delightful compared to other places on the coast.

For many years to come the timber will be a mine of wealth. In all parts of the Columbian coast, especially in the southern parts nearer the centres of population, are found little lumbering camps, which shift their position frequently, as the larger trees fall under the axe, chiefly for the foreign market.

The agricultural resources of this colony have not yet been greatly developed, owing to the necessity of irrigation in the dry zones and owing to the thickness of the forests in the damp zones, and on account of the difficulties of marketing the products. The land laws are wise and liberal, however, in British Columbia.

I must next touch briefly on mining. The rich ledges which are being profitably worked in California, Oregon, and Washington must have their counterparts in British Columbia and Alaska.

As I went northwards along the coast we touched at the coal-mines on Vancouver Island; the deepest shaft here at present is one of 626 feet, but it has been shown by boring that good coal is found at a much greater depth. In fact the supplies are probably almost inexhaustible, both on Vancouver Island and on other islands near. On another occasion, when canoeing to Bute Inlet, I visited the newly-found iron-mines on Texada Island.

During the next twenty years we shall see great mining operations begun in British Columbia. There has been a great rush of settlers and land speculators lately to Quatsino Arm, an inlet on the seaward side of Vancouver Island, because, besides the presence of coal, there is the probability that this harbour may become the starting-point of the trans-Pacific steamers. Then again, when I reached Fort Wrangell I found two separate companies about to commence hydraulic mining for gold along the diluvial banks and terraces of the Stikcen river—being the first enterprise of the kind undertaken. The river was still frozen over. It generally "opens" the first week in April. Then again, further up the coast on Douglas Island, I visited the celebrated Treadwell gold-mines and reduction works, containing, I understand, 240 stamps, and outputting between one and two hundred thousand dollars' worth of gold per month. With regard to mining, I have said enough to merely indicate its extent.

Lastly, I must allude to the fisheries. At present the salmon fisheries are by far the most developed; the deep-sea fisheries are yet unexplored, and can hardly be said to have taken their place amongst the industries of the country.

All the larger streams of the coast and islands swarm with varieties of *salmonides* from spring till late autumn. There are about four kinds, but their habits are yet entirely unknown. We only know when to expect them in the rivers and estuaries, and to make preparation accordingly for their capture.

The Fraser and Skeena rivers in British territory, and the Columbia in American territory, are the scenes of the greatest activity; and on each one the amount of salmon canned each summer reaches to hundreds of thousands of cases, each containing four dozen tins, beside quantities salted and also cured by drying, the latter principally by the Indians for their own use—for dried salmon is the chief food of the coast tribes.

Most of the canneries on salt water net their salmon near the mouths of different rivers, using small steamers and whale-boats for the purpose. On the Fraser and Columbia the fish are netted in the river itself as well as at the estuary; and I might mention that this summer on the Fraser the salmon did not at first make their appearance as usual, and fears were entertained of serious losses to the fishermen and cannery owners; then suddenly the salmon appeared in countless myriads; more fish were netted than could possibly be used, and the great river boiled with fish-life. I remember three months ago, towards the end of the season, as high up the river as Lillooet, seeing the surface literally black with their dorsal fins, feeling them glide through my fingers, and even capturing some salmon with my umbrella.

From the manager of a cannery at Port Essington, near the Skeena river, I obtained the following particulars. I also visited other canneries at Pyramid Harbour, at Alert Bay, and on the Fraser river. The fish are cleaned and cut up to fit the cans, in which they are soldered down. These are then boiled in fresh water, pricked, soldered again, and finally steamed in a retort.

Having alluded to the salmon, I am bound to mention the halibut and cod, and the black cod, which is not known in Atlantic waters. The experimental efforts during the last three years have shown that these fisheries may turn out superior to the Newfoundland banks; besides which the storms are less severe, there are no icebergs, and the ports for shipping are near at hand.

There are many other kinds of fish. Dog-fish are boiled down to make a cheap kind of oil, by most of the settlers along the coast, as a lubricant, or for burning. The colachan, or candle-fish, furnishes oil to the natives for food purposes, the herrings come in shoals at certain times, and I have seen numbers of whales in these solitary inlets of the Pacific.

The number of islands and rocks make the Inland Passage difficult of navigation. I met a man trading on the Skeena river who had turned up a wrong inlet or passage near Banks Island, and sailed northwards for three days, till he reached the head of this arm of the sea, before discovering his error, and was obliged to sail back some hundreds of miles. I asked him whether the Indians were dying off. He answered, "Yes, nicely."

Then again the tides are most complicated. In some inlets there is but one tide a day for some months in the year, sometimes no tide, and sometimes three. In other inlets the tides seem to follow no rule at all; the whirls and rips are most dangerous in certain places to small boats, while the velocity reaches 12 knots an hour in narrow parts. Is it any wonder that the Canadians have given up any attempt at a tide-table in despair?

Finally, to close these introductory remarks, I will endeavour to give an idea of the scenery and surroundings passed through as I travelled north by one of the periodical steamers which keep up the increasing communications between the new-world ports and newly-discovered harbours in Puget Sound and on Vancouver Island (such as Tacoma and Victoria) on the one hand, and the new settlements along the coast, the old Russian fortress of Sitka, and other points as far north as Chiloat on the other hand.

The distance from San Francisco and return is about four thousand miles, and the time occupied varies from twenty to thirty days, and from Puget Sound from twelve to twenty-two days.

Commencing at the south part of the Inland Passage, the first inlet is Puget Sound, nearly two hundred miles long, and 1600 miles in circumference, with numerous islands all thickly wooded.

On a cloudless day snow-mountains can be seen glittering in every direction—some on Vancouver Island, some on the mainland to the eastward, others in the Olympic Range.

In April I left Victoria for my fourth journey up the coast. A line of railway connects Victoria with the coalfields. Thence in the steamer I proceeded westward between Vancouver Island and the mainland, through the wide channel named Straits of Georgia. On the side towards the mainland are two deep inlets—Bute Inlet, which I traversed by canoe with Indians in 1887, which is about thirty miles long, and with mountains over eight thousand feet high, rising sheer from the water, and Jervis Inlet. These are not seen from the straits. It is necessary to penetrate the narrow passages between the groups of islands before they become visible. All the rocks I examined in Bute Inlet were granite. On Vancouver Island at this point the mountains towards the centre are heavily timbered, generally obscured by cloud, and over five thousand feet in altitude. Farther to the west there are peaks on the island which rise to over seven thousand feet.

The way now lies through Discovery Passage, passing Cape Mudge

(named from one of Vancouver's officers), skirting Valdes and Thurlow Islands, and threading Johnstone Straits, where a spur of the mainland thrusts itself out amidst the other islands, and comes into close proximity to Vancouver Island. Entering Queen Charlotte Sound, and passing close to an Indian village and a cannery, we strike away from Vancouver Island, along the northern shore of which we have been coasting for about two hundred and fifty miles. Between the mainland and the open sea in Queen Charlotte Sound there is nothing but the Sea Otter Islands, but the steamer soon enters more intricate and winding channels. At one point we turn off through the narrow Gunboat Passage—for the broad inviting channel ahead only leads inland—and follow an exceedingly long and narrow fiord between Princess Royal Island and the mainland, more like a river than an arm of the sea, scooped out no doubt partly by the action of glaciers, where is found some of the grandest scenery to be seen on this particular route—composed chiefly of waterfalls, cliffs, trees, and high mountains on the right hand and on the left. On emerging we immediately enter Grenville Channel, remarkable as being nearly forty nautical miles in length, in some places not more than a mile wide, yet almost perfectly straight, and shut in by high mountains like walls on either side.

We emerge through Arthur Pass and catch sight of the first sign of human life seen for many leagues (unless it has been some Indian canoe), in the shape of a salmon-cannery built on piles above low-water mark, this being the vicinity of the Skeena river. Twenty miles farther, in Chatham Sound, the old Duncan Mission of Metlakatla is seen, with a row of substantial houses, and fifteen miles farther the Hudson Bay Company's Fort Simpson. We soon cross the mouth of Portland Inlet, which leads to Naas river and the International boundary (which reaches the sea at the head of Portland Canal—a fiord penetrating the mainland for a distance of about 100 miles); this is the commencement of Alaska, here a mere narrow strip that shuts off the whole of North British Columbia from the sea.

If cousin Jonathan would make this narrow strip over to British Columbia, I think we might reasonably allow him in exchange the privilege of the exclusive rights of the seal-fisheries in Behring Sea. This would also save the expense of marking the frontier, which is not yet delimited. We might even throw in Mount Saint Elias, about which there was so much uncertainty as to its exact position, and whether it lay in American territory or no, that an expedition of United States Government Surveyors, Messrs. Kerr and Russell (whom I had the pleasure of meeting on my return at Sitka) was this summer sent to locate it precisely, being conveyed to Behring Bay, or Disenchantment Bay, in a man-of-war. They are of opinion that St. Elias is in the Union, but, as though to console us for the loss, it is found not to be so high as the United States Coast Survey made it out to be. I

must refer again to this expedition later on. Seventy miles farther, passing through Tongass Narrows, brings one to a settlement on Revil-lagidedo Island: as far again, through Clarence Straits, and then between Zarembo and Etolin Islands, brings one to the American settlement of Fort Wrangell.

There is practically no agriculture here, nor anywhere else in Alaska, nor do I think there ever will be. Its wealth lies in other things, which I have indicated in referring to British Columbia.

Here I found some small stern-wheel steamers used for the ascent of the Stikeen river, of which the mouth is distant about fifteen miles to the northward. It is navigable to Telegraph Creek, in British territory, a distance of 126 miles.

Above this is the "Great Cañon," which extends for many miles, quite impassable for boats, but traversed by the miners in winter on the ice. From Telegraph Creek a pack trail 62½ miles long, constructed by the Canadian Government, leads to the Cassiar mining district. There are some horses employed here as pack-animals. They can only go backwards and forwards from Telegraph Creek to Dease Lake, where the trail ends. In 1887 Dr. Dawson reached the Yukon by this route. He affirms the probability of a possible connection of the Stikeen and Mackenzie by a railway at some future date. The headwaters of the Stikeen are yet unknown, they are in British Columbia, in a country said to be very mountainous. There are a number of remarkable glaciers in the Stikeen valley, the four largest of which are on the west side, but in size they bear no comparison with those on the coast near Mount St. Elias. Near one known as Great Glacier, there is a copious hot spring. Another is known as Flood Glacier. Occasionally there comes a great rush of water from it, so large as to raise the river to half-flood level for a few hours.

A similar phenomenon caused us much perplexity on the Yahtsetah river near Mount St. Elias.

After leaving Fort Wrangell, we emerge into Sumner Strait, and turning abruptly to the right, steam cautiously through Wrangell Narrows which has been carefully buoyed for vessels.

Another hundred miles through a series of wide channels, keeping between Admiralty Island and the mainland, brings one to Juneau, a mining settlement, and the outfitting-place for miners bound for the interior districts of the Yukon. Here is the Treadwell mine, to which I alluded previously.

It is yet a day's journey northwards to Chilcat, where I commenced my explorations; but I must digress for a moment to allude to Sitka (Alaska's chief town), and Glacier Bay, where the steamer called in order to allow us to examine the ice-cliffs in close proximity, from which masses of ice fall constantly. Muir Glacier has a sea-front of a mile and ice-cliffs 300 feet high, with a central velocity of 70 feet a day. The

Jakobshavn Glacier in Greenland moves 54 feet daily, but the Mer de Glace only 1½ feet a day. A large number of other glaciers, probably as big, or bigger, discharge their ice into this great bay, which is consequently almost choked by miniature bergs, through which the steamer forced her way. Of the encircling snow-peaks the highest is over fourteen thousand feet.

Sitka is situated on Baranoff Island, half a day's sail to the southwards, in a bay surrounded by high mountains and studded with beautiful islands, but very damp and rainy. The story of the capture of New Archangel, or Sitka, by the Russians from the Indians, is a series of bloody fights between Baranoff and his men and the natives. He came here in the year 1799, after hearing the report of Captain Shields, an Englishman in the Russian service, accompanied by a number of sea-otter hunters in their *bidarkies*, or seal-skin canoes. About six miles from the present Sitka he built a stockade. During the absence of Baranoff with most of the garrison, this stockade was destroyed by the Indians and the defenders killed, with the exception of some who escaped on board an English ship, which conveyed them to Kodiak. In 1804 Baranoff returned to Sitka with forty Russians and three hundred Aleut hunters. He found the natives in possession of a strong stockade, built on the site of the present log castle. In endeavouring to capture it, he was at first severely repulsed, but he finally, after a bombardment, dislodged the Indians, who were estimated at 5000. At the present day their numbers are less than a tenth of that. Upon the site of the Indian town, the Russians erected huge log buildings, some of which stand here to-day, to attest the solidity with which they were constructed.

The extreme healthiness of the country is an advantage, and I may mention that I know no healthier one; but this is more than counterbalanced in the case of the explorer, by its being the most difficult to penetrate of any within the temperate zones. In this I shall be borne out by those who have attempted it. Part of the region is included within the territory of Alaska, part in British Columbia, a colony which is but now emerging from the sway of savagery. Much of it still now has been barred to whites by the red-man. For instance it was only within recent years that the Taiya Pass to the Yukon was opened to miners, while this year the same tribe who had prevented the miners from passing, by their rapacious demands as packers, placed a serious obstacle in the way of travel. As to the Chilcat passes, the twin doorways to the interior, I was uncertain up to the very last moment whether the Chilcat tribe would permit me to go by. I therefore camped first on the seaward side of the straggling aggregation of houses (some forty in number) which forms the winter village, named Klokwan, and after two days shifted my camp to the landward side, nearer to the unknown regions, so that I might test the feeling of these Indians relative to a white man entering their country before I commenced the ascent.

See p 82

Before I could engage any of them to accompany me they required to be convinced that I was no trader by an inspection of my baggage; to satisfy themselves that I had no materials for barter with the Tagish or Stick Indians, as those who inhabit the interior are named.

Nothing was stolen. I have always found the red man was no pilferer, however fond he may be of duplicity and deception in small matters.

When the natives are all gone, those interior regions which are only attainable on foot with pack-carriers or packers will become more difficult of access, because now these Indians (broken as they are by disease) can yet carry heavier packs than a white man. They can travel farther on foot and endure greater hardships. They do not require so much in the shape of clothes and bedding. Their dried salmon, which they carry as food, weighs little, and they are satisfied with that. They are able moreover to supplement this with many kinds of roots, herbs and fruits which are eatable. I was endeavouring to learn from the Indians some of these useful secrets, for I have not yet met a white man who had much practical knowledge of these things.

The natives are steadily and surely disappearing in many localities along the coast, owing to causes that I will allude to presently. But now, while the Indian still exists, I would personally undertake, with sufficient funds, to reach any portion of north-west America, or to cross the continent from any one point to any other point.

Formerly the different tribes were afraid to quit their tribal territory, but now Indians can be found willing to accompany the white man through regions which are as strange and unknown to them as to him. Some, for instance, have accompanied minors as far as the mouth of the Yukon, and returned home by way of San Francisco.

I have stated that, in some districts at least, if not in all, the Indians are decreasing in number. This is the case as regards the once powerful Chilcat tribe, with whom I had to deal. Their decrease is partly owing to various epidemics and disorders, but greatly (and I fear chiefly) at Chilcat due to the importation of large quantities of whiskey. I represented what I had seen to the Governor of Alaska. The laws dealing with the subject are severe enough, and if they were even partially enforced the evil would be at least mitigated. I am glad to say things are not so bad in British territory along this coast, but at Chilcat they are as bad as they can be.

Indians sometimes came to my camp suffering from the effects of impure spirit—which can be obtained in any quantity in the neighbourhood of certain salmon-canneries that I could name—apparently merely for the sake of the moral comfort and support they seemed to obtain from the presence of white men who had no whiskey in their possession, and could not supply them with what to them is poison.

These Indians rate their services at a very high figure. So long as

See also p. 74

they have enough tea and sugar and hard tack for immediate use, they have no particular desire to work. Nor do they seem to lay anything by. A dollar only means so much sugar or flour to be purchased at one of the trader's stores down at salt-water. The Chilcoots, for instance, in 1887 refused to convey the effects of Mr. Ogilvie over the Taiya Pass, an affair of three days, for less than twenty dollars per hundred pounds; they subsequently accepted half that amount for going two-thirds of the distance; but I rarely found them to take less than whatever price was first mentioned, either for a purchase or for wages. This summer the Chilcats charged Messrs. Wells, Schanz, and Glave no less than forty dollars per hundredweight for provisions packed to Lake Arkell—some twenty men, women, and boys receiving more than eight hundred dollars for a week's work. I was therefore unable, owing to lack of funds, to employ the Indians to any large extent, or even to have them accompany me at all beyond a certain point; and we had to depend upon ourselves and do our own transportation in consequence, by packing our provisions and tents upon our own backs—the most fatiguing and laborious work with which I am acquainted.

Knowing that this might be the case, I had brought three men with me from Vancouver Island, engaged to accompany me as packers; one was an experienced woodsman from Ontario, expert with axe and paddle. From pure love of mountaineering, he would employ the bye-days, when we were not advancing and shifting camp, in climbing alone the loeliest and highest of the unknown peaks around us; innumerable grouse, and more bears than one, did he add to our food-supply. His name was John L. Hammond. Another of my men was half Kwagiutl Indian and half Sandwich Islander—not a promising mixture; yet he came to me strongly recommended by Mr. Hall, an envoy of the Church Missionary Society living at Alert Bay on Cormorant Island, and I had every reason to be satisfied with him. The third I found unequal to the hard work, and unwilling to what he called demean himself by learning from those he deemed his inferiors, so I sent him back at an early period of the expedition.

Our point of disembarkation was an establishment for canning and preserving the flesh of one of the varieties of salmon which are so numerous upon the Pacific coast. This was known as the Pyramid Harbour Salmon Cannery, so called from a curious conical-shaped island below low-water mark in the bay, where I was hospitably entertained by the manager.

We were now at the most northerly point of what is known as the Inland Passage. The distance from this point to the open sea is no less than 370 miles. This narrow salt-water inlet is enclosed on both sides by very steep snow-clad mountains between 5000 and 6000 feet in height, and has been named Lynn Canal by the American survey. It is remarkably straight; there are several glaciers upon both sides, some

high up, and some descending to the sea; at the head it forks into two smaller inlets, the Chilcoot Inlet on the right-hand side, or towards the east, whence the Taiya Pass leads to a branch of the Yukou; and the Chilcat Inlet on the left, or west, which was entirely unexplored as regards the passes into the interior as well as the interior itself. I must not forget to mention that one white man, Dr. Krause, had already ascended to a certain point and produced a fairly accurate map of the route he followed.

The only canoe procurable was not large enough to contain all the party. It was to be navigated by a lame Indian and his boy, and was to convey us up the river for about 25 miles as far as the last and largest of the Indian villages. I followed the shore on foot as far as the mouth of the Chilcat river, a distance of six miles. The mountains descend very abruptly into the inlet; although the water is muddy and brackish owing to the numerous streams and glaciers, and not over 20 feet deep, yet in places the beach is passable only at low water, while in other inlets I have found for miles together that there was no beach or ledge on which one could even land, but that the cliffs, worn and corrugated by the waves, descended sheer into deep water. The snow was yet deep, and the canoe had gone across the bay to the mouth of the river, and we had the greatest difficulty in making our way along the shore. The snow was also soft, the moss and trees damp and rotten, and the granite cliffs almost perpendicular. The crannies and cracks within reach of the waves were completely filled in places with the bodies of small fish resembling the oily oolachan, which is netted so largely in the neighbourhood of the Skeena river in British Columbia, farther south. The scenery was grand, and alpine in the extreme. It was the commencement of May, but the land had hardly yet emerged from the grasp of winter. The United States chart places the head of Chilcat Inlet some nine miles higher up the valley than is actually the case.

In the lower part of its short and rapid course, the Chilcat river hugs the left or eastern side of the valley, leaving an expanse of valley bottom on its right bank some four miles wide, consisting of stones and brushwood, which becomes covered with muddy water during the summer from the melting of the snows. Having rejoined the canoe, we camped on some high ground on the left bank near some Indians, who supplied us with several pailfuls of sticklebacks, small and very beautiful little fish, which they were capturing in great numbers in the eddies with a scoop net, but covered with the most formidable spines, which made them useless for eating except in the form of soup.

After three days of paddling, poling, hauling, towing, and wading, we reached Klokwan, and were immediately surrounded by a crowd of natives.

The weather was cloudless, and the sun so warm that from all the glittering pinnacles of the mountains on both sides, but chiefly on the

north, avalanches were falling almost incessantly with a sound like distant artillery; but the masses of rolling snow, when seen, looked very small, and seemed to slip down slowly when compared with the great volume of sound they produced. They seemed to keep to well-defined tracks, and sometimes assumed the appearance of white waterfalls, at other times of masses of froth or dazzling foam surging and boiling up together.

The Indians are fond of burying their dead in impressive spots, or amidst grand scenery, or near some freak of nature; as though in some natural mausoleum. For instance, in Vancouver Island and British Columbia I saw their remains in boxes on the summits of the loftiest cedars and firs; in Chugak, or Prince William Sound, their mummies are deposited high up on the face of beetling cliffs. Here on the mountain, about 2000 feet above the village, under a noticeable bluff, in a cavern, I accidentally came on a quantity of carved coffins partly destroyed by animals, and so old that they crumbled at the touch. In the village of Klokwan there are many wooden mausolea, chiefly of *shamans*, which are almost as large as some of the houses amongst which they are situated.

I experienced no opposition from the chief, a stout hale-looking Indian named Kintaghkoosh. He owns several large huts, in front of which are a flagpole and two old Russian cannon, and has a large amount of blankets and other kinds of wealth stored away in boxes of all shapes and sizes. Here some of my surplus supplies were deposited in safety.

The number of inhabitants at Klokwan, according to the last report, is about four hundred. There is no mission now nearer than Juneau, but some years ago a Protestant mission was established on the promontory which divides the Chilcoot and Chilcat inlets, which was abandoned owing to the very unpleasant conduct of the Indians.

The Roman Catholic priests have had much success in securing the attachment of the Indians, especially in British Columbia, in the interior beyond the belt of the coast rains, where the climate is drier and they possess cattle and horses, and are altogether happier and better off.

Northwards from California along the whole coast, as far as Behring Straits, no missionary to the Indians has had any marked degree of success except Mr. Duncan, and that is due to his personal qualifications. Now he has crossed into American territory and his Indians have followed him, and upon one of the large islands they have founded a new village.

From Klokwan I followed the Chilcat river upwards to its junction with a large stream, which I named the Wellesley river. I found afterwards that it had an Indian name—Klaheena. Up to this point we had very severe work towing and poling against the velocity of the current. The low temperature of the water in the morning made the continued wading quite painful—37° Fahr.

It was necessary at starting in the morning to see that the canoe lay

own
Klenda's goods!

perfectly level in the water by properly arranging upon the bottom the oil-canvas sacks containing our supplies of food; the tow-rope had next to be attached to one of the cross-pieces, at a distance from the prow of one-third the total length; after which I seated myself in the stern with a paddle as steerer, while the others towed. At other times I took turns at the tow-rope, while two of the men who were expert at poling against the stream, remained in the canoe for that purpose.

At some points where I measured the speed of the stream it reached nine miles per hour, and our progress against it was very slow and exhausting. Sometimes we had to cross where the water was too deep for the pole to reach the bottom, and while paddling over we would be swept downstream half a mile. If the bow or stern were the lowest in the water, that portion grounded first, and the other end would be whirled round by the force of the current. Nor was it easy to gather up the rope and leap out upon a shelving bank of loose pebbles, past which the craft was being whirled with arrow-like rapidity, and then to hold on.

Under such circumstances bungling would be followed by a cold bath at a temperature perhaps of 37°.

I found roughly that these rivers increased in swiftness and volume from noon to midnight owing to the melting snow, especially on warm sunny days. The temperature also increased about six degrees towards evening. The light rains we experienced seemed to have no effect in raising their level. After a week of rainy weather I found the Klahena a foot lower, but a few days of warm sun caused a rapid rise, distinct from the daily fluctuations in level. Many of the valleys showed signs of having been excavated and worn by glacial forces.

Every day a strong breeze sprang up about noon, and blew steadily till evening up the valleys, and in a contrary direction at night. This was chiefly observed during fine clear weather. Similarly on the salt water inlets along the coast a breeze generally blows inland from the sea on fine days, but in winter it prevails in the contrary direction. I observed by the motion of the clouds that this was often independent of the direction of the upper air-currents. It is a curious fact on the Pacific Coast of Alaska, as I have frequently observed, that a west wind brings fine weather, and an east wind brings rain, without reference to local winds.

The Chilcat canoes are made of cotton-wood, and are remarkably tough and strong. Some three or four days I remained camped in the same place below the pass, which we employed in felling a large cotton-wood tree and hollowing it into a very respectable canoe, using for the purpose three axes and an adze, and subsequently filling it with water, into which we dropped heated stones, rendering it so pliable that we were able to stretch it to a convenient breadth. The largest of the Chilcat canoes, however, measuring thirty feet in length, are made of cedar, and come from British Columbia, usually from the Queen Charlotte Islands.

A risk to which the canoes were continually exposed was that of contact with blocks of ice floating down with the current, which were difficult to see, especially round bends, or in the foam and waves of rapids. We also had to walk upon the crust of ice while towing, bordering the stream like white walls, which the water had so undermined that pieces fell off with an appalling splash like small bergs, but always clear of the canoe.

We obtained some fine fish, salmon-trout—not salmon, for the latter had not yet arrived—caught by striking hither and thither at random in the turbid water with a long hook.

Another difficulty, and a peculiarity of these Alaskan rivers, is the enormously wide beds in which they flow, strewn with gnarled and jagged snags, and roots firmly embedded in the gravel, which, when hidden, form a serious danger, which we could not escape, for one of my canoes and a raft were capsized from this cause, but most of the contents were firmly lashed, and the occupants got safe to shore with a complete ducking. One craft was abandoned, the other grounded on a shallow, and was recovered.

These accidents give an idea of the nature of Alaskan and British Columbian rivers on this coast.

Though the Chilcat natives are accustomed to their native rivers, I found that on their trading journeys into the interior they left their canoes, or only took them a short distance, preferring to travel on foot with their baggage tied upon their backs, though the trail was of the very roughest kind, and they were constantly forced to wade from one side of the stream to the other by the encroaching cliffs. I observed them in crossing usually hold on to a long tree or pole in parties of five or six, the strongest man being up-stream to break the force of the water, a plan which we afterwards followed with advantage when we had to cross the Klahena.

The Indians also preferred to wade in place of forcing their way through the bush, which was very dense, when there was any choice in the matter. In choosing a place to ford we bore in mind that where the river was swiftest and broadest there it was also shallowest, and that by carrying a heavy stone, when we had no packs on our backs, we were less likely to be swept off our legs.

On our progress we greatly improved the Indian trail by the use of the axe. It was very faint, and frequently disappeared altogether.

In order to obtain a panoramic view of the country, I made a partial ascent of several high mountains, to which I gave names. I found the brush thickest near the base, and also immediately below the snow-line, caused perhaps by the increased dampness of those portions; in the central portions, along a zone ranging from 1000 to 3000 feet in breadth, it was not so tedious to penetrate, excepting on account of fallen trees of large dimensions, and that unpleasant plant, growing to the height of

a man's chest, known as the devil's club, and covered with fine loose barbed priokles.

Where the stream united shallowness to great velocity, I found it the best plan to tow with one rope fastened to the bows of the canoe and another attached to the stern, which enabled us to direct its course without the necessity of anyone remaining in it.

I found that the starved-looking Indian dogs, who are in the habit of greatly resenting the presence of the white man, were made to carry loads of 25 lb. in saddle-bags when their owners made a journey; little children, too, of eight and nine carried packs proportioned to their strength.

We first enjoyed ten days of perfectly fine cloudless weather, a very unusual thing for this coast. This was followed by nine days of clouds and rain, which caused the river to fall almost as much as the warm weather had caused it to rise from the melting of the snows. But by this time we had almost got beyond the region of the coast rains, and felt the sheltering influence of the great snowy range, including Mounts Fairweather, Crillon, La Perouse, and Saint Elias, which lay between us and the Pacific, and the amount that fell was small, though the weather continued dark and gloomy.

On May 15th, while I was seated writing beneath an arrangement of fir boughs to keep off the rain, there came a slight earthquake shock, and the structure descended gracefully and deliberately upon me. From beneath the ruins I observed a little Indian boy, who was hoping to pick up any trifles we might throw away, help himself from our supper. If this was not quite in accordance with my previous estimate of the Indian character, it must be remembered that this was only a child, and I have reason to believe that he was desperately hungry.

However, soon after the Indians killed a fine black bear, and some days later Michael Kalamo, whom I mentioned as being half Kanaka, half Kwagiutl by descent, killed a black and also a very large brown bear; and Hammond killed a black and a cinnamon bear. We had previously seen numbers of bears, and on one occasion I saw five at the same moment. In fact, I characterise the White Mountains, as well as this entire district, as the greatest bear country I have yet visited.

We found no traces of gold in paying quantities, but a great variety of blocks of variously coloured marbles, of which some of the moraines were entirely composed.

North of the Fraser the only rivers which boast of any length are the Skeena, the Stikeen, and the Naas. All the others are short and rapid. So we found that the Klahena as well as the other branches of the Chilcat soon became mere mountain torrents, and we had to abandon canoe-travel and pack our food upon our backs.

We had previously manufactured two sledges of different sizes, and

wherever there was any snow remaining we were able to drag our things along instead of carrying them. We commenced to do this on May 7th, and used them at intervals for the next seven days as far as Camp 9, after which the snow had so far melted as to make even the labour of constant pack-carrying preferable to that of conveying the sledges from one vanishing snow-patch to another.

I thus realised that it was easier to travel in this country in winter than in summer. The snow was quite hard, and although I had provided snow-shoes for the party, they were never required, as they would have been in winter-time. High up, however, near the mountain summits, I found the snow soft. A much greater load can be dragged in a light sled over the snow than can be carried on the back.

On May 8th I explored the ground ahead of us for a distance of five miles, following an exceedingly faint Indian trail through the forests, and then, guided by the sun, made my way back to the river through the densest brush and thickets of devil's-club thorns, with long elastic stems covered with barbs, which had to be pushed aside.

I had dismissed the Indian canoe as soon as we were able to use the sledges. But now I found the brush so thick and the torrent so dangerous to wade, and the snow patches so far apart, that I was obliged to return in person on foot to Klokwan Indian village to hire a canoe once more, trusting to meet with no streams which we should not be able to ford or swim, and that the natives would ferry us over when we appeared opposite Klokwan without blackmailing us. The distance we had previously ascended by canoe I now retraced by land, guided by the sun and by the mountain tops, pushing by main force through the bushes, plunging into cold streams, crossing others by means of fallen trees, or threading our way through a network of marshes.

On arrival late in the evening opposite Klokwan, I hailed some dusky figures in hopes of finding a Charon, expecting they would demand ten, fifteen, twenty dollars for fetching us. In anticipation of this I carried an air-cushion, with the help of which I should have swum the river. To my agreeable surprise, an Indian immediately poled his canoe upstream, and then quickly paddled across and downward towards us.

That no advantage was taken of our distress I found to be due to the presence of the American expedition, which had just arrived, and with whom I was already acquainted. I purchased a canoe after some difficulty for fifteen dollars, and next day, with a fresh supply of food, we reached Point Christopher, as I had named the bluff on which our camp was placed, after twelve hours of difficult and laborious poling and towing against the current.

Meanwhile, my other two men had been cutting a good trail along the bank, both being very expert axemen.

Next day some Indians came into camp, having crossed the Pass from the Altshk river, carrying heavy packs. One of the women was

a Yakutat. They pointed out to me the position of the pass, and explained that other Indians had remained a short distance up the valley, in order to manufacture some cotton-wood canoes. They stated that it took seven days to reach Dry Bay, and that there were canoes upon the Altsekh, which shot down to salt water with great velocity. This agrees with the account of Glave and Dalton. We had made a bridge over a branch of the Wellesley by felling a tall tree and floating one end across. In the morning, when the river was always lowest, the trunk was a foot above the surface of the stream, which was at that point seven feet deep. Across this the Indians stepped without the slightest hesitation with their burdens, turning both feet towards the same side in balancing themselves, not outwards. Others turn them inwards.

On May 12th I ascended to a height of about 4000 feet on the sides of Mount Glave, in order to obtain a view of the surrounding mountains. The softness of the snow interfered with our ascending higher. I was accompanied by Michael Kalamo, and hastened to recross the river before noon on account of the daily flood from the glaciers. Above the timberline we sank waist-deep in the snow between the patches of willow-brush. On the east lay the main branch of the Chilcat river, less turbulent than the Wellesley, and divided into many channels, while in the distance, on the south, rose the summits of the great snow range of the coast.

The daily temperature was increasing. On May 2nd at sunset, the thermometer marked 40° F., a week later at the same hour 50° F. On the 18th we struggled all day against the stream, towing with one rope, then with two. A cotton-wood tree I measured girthed thirteen feet. The shallow water was full of young salmon about an inch in length, playing amongst the carcasses of their dead ancestors. In the autumn millions of salmon are left stranded in the shallows and on the sand-banks where they die; these were now in various stages of decomposition, which made one wish for something less antiquated. Many had been half eaten by bears. The velocity of the current was here nine and a half miles per hour. Next day my men hunted and wounded a she-bear on the side of a mountain I named Mount Shanz, and the following day I again ascended to a height of 5000 feet on Mount Glave in search of fresh meat.

We were delayed by bad weather for some days. On May 22nd, I made an exploratory trip ahead of the expedition with my half-breed. The weather was still damp, and doubtless on the coast it was raining much more heavily than here, but we had now eaten down the provisions to such a point that we could manage to carry most of what remained together with blankets, axes, and other necessities by making double journeys. On the 23rd I started with one man to select a camping place. We carried about fifty pounds each. I preferred the bed of the river, frequently wading. My companion kept mostly on the bank,

where I could trace his progress by the loud crackling of the branches as he forced his way along. For more than a mile we were obliged to creep along the edge of the stream, under steep clay banks, from which peeps were continually dropping. Then we emerged into a district where the bushes grew more thinly. I saw large blocks of pure white marble scattered about, some of large dimensions, mixed with marble of various colours, finally camping near Marble Glacier. On the 26th I ascended alone as far as snow-line on one of the mountains at the foot of the Klaheena-Altsehk Pass, and obtained a view of some distant ranges entirely covered with snow, and without any rock showing, and bare of timber. The bases were not visible. About five miles above my tenth camp the valley divides, the left or western branch leading to the pass. At this point the country is more open and progress easier. I counted eight glaciers in valleys opening into the Wellesley or Klaheena on the right bank, but none on the left. The distance from our camp to the mouth of the Chilcat river was about 60 miles.

A few days later a white man, to my surprise, who had recrossed the pass alone, suddenly arrived in my camp. He said his name was Meehan, and that with two Norwegians he had crossed the pass in February, having been over it previously, and that dragging their food on sledges, they had descended the Altsehk to a point where a large river, called Kla-tsa-kult, came in from the westward. Mr. Glave also noted this large river, which will probably be the route followed by future explorers.

They had found no indications of gold, and had abandoned most of their baggage and provisions, as the disappearance of the snow had made it necessary to "pack" their things instead of using sledges on the return journey. He had outstripped the others who had heavier packs. I took him with me to the coast. Of his two companions one was drowned in the Klaheena a few days later, at a spot where we ourselves experienced great difficulty both in ascending and descending. Later on I saw the survivor. From these two men I learnt that just over the pass there are some houses used by the Chilcat Indians as stores for their trade with the tribes of the interior. The Chilcats and Chilcoots will not allow these inland tribes to approach the coast with their furs, but insist on acting as middlemen between them and the white traders. This was the reason they wished to assure themselves whether or not I had come to trade with these inland tribes. I might further illustrate this by referring to the difficulty Mr. Ogilvie experienced in persuading these inland, or Tagish Indians, to commence the transport of his effects from the point where the coast Indians had deposited them, as it was yet in the country where the latter claim exclusive rights. They seem no better than slaves to the Chilcoots, and are afraid of offending them. Many of the Chilcoot and Chilcat Indians have Tagish wives, some of whom I saw, and remarked a distinct difference of type, though it was

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I think it right that I should mention what has been done in this district by Messrs. Wells, Glavo, and Shanz, who followed in my tracks as far as Klokwan, the great Chilcoat village I have alluded to. I had already reached a point some miles above, in the Klahena valley, but knowing of their arrival I returned in order to learn which route they proposed to take towards the unknown country ahead of us. As I had already chosen the Klahena tributary, learning from the Indians that that was the best way to the Altsehk, they, in order that as much fresh ground as possible might be traversed, continued up the main Chilcat river with a large number of Indian packers, crossed the divide and discovered and named a large lake in British territory, Lake Arkell. Here they separated, some of the party constructing a raft and commencing the descent of the Takeena, which flows into the Yukon. I have not yet heard of their return.

The other two, consisting of Mr. Glavo, who was recently in charge of Equatorville Station on the Congo, and Dalton, who was one of the men engaged to accompany us to the Mount Saint Elias in 1886, succeeded in reaching, in company with some Indians who were going in that direction, a branch of the Altsehk other than that which leads from the more direct pass, which I may claim to have discovered. They then descended the river in a canoe with some natives whom they found willing, and reached the coast at Dry Bay, and thence proceeded to Yakutat by way of the lagoons which are found between the mountains and the sea, and returned to civilisation by a chance trading vessel. I recently saw Mr. Glavo in New York, and learned much from him about the Altsehk.

A party of American surveyors also has passed this summer amongst the glaciers in the neighbourhood of Yakutat, and have apparently determined the height of Mount St. Elias as nearer 13,500 than 19,500 feet, which the American Coast Survey had previously made it.

Reaching the head of Yakutat Bay on June 18th, by the 1st of August they were at a point half-way between the bay and St. Elias; on the 21st they had reached the base of St. Elias, probably on the east side, and at three the following morning commenced the ascent. The weather had been fine for the past ten days, but after a few hours, snow began to fall, and continued for thirty hours, and they had to return without having reached the summit. They made another attempt two days later, and again a storm came as suddenly as before.

A glacier which they estimated to measure a thousand square miles, lying at the south base of Mount St. Elias, they named the Piedmont. But I think this must be what the American Coast Survey had already named Malaspina Plateau, the western part of which we named the Great Agassiz Glacier. With regard to the new height of Mount St.

Elias, Mr. Baker who, with Mr. Dall, made the previous triangulation which gave 19,500 feet, is spoken of as one of the most accomplished mathematicians in the United States Survey. Our Admiralty chart gave 14,975 feet, the Russian chart 17,854, Grewink 16,754, D'Agelet 12,672, and I stated in 1887 that it seemed to me not to exceed 15,000 feet.

I have thus described to you a portion of this most interesting part of North America, which in grandeur of natural topography far exceeds the rest of the continent, and have touched upon the various explorations which have been carried on there this summer. Owing to the extremely mountainous character of the country, its resources are practically limited to minerals, fisheries, and timber.

There is large area of country in the neighbourhood of the head-waters of the White River of which we know nothing. I am aware that the members of the American exploring party, as well as myself, cherished the secret hope of being able to reach that country.

Some of the reasons why this White River country is interesting though mysterious are these: first, the widespread and comparatively modern layer of volcanic ash, or pumiceous sand, deposited over a large area of the Upper Yukon basin, observed by Dr. Dawson in 1887. The position of the greater mass of the deposit seems to show that it was derived from the westward. The nearest volcano is Mount Wrangell at the forks of the Copper river; but the Indians report the existence of a burning mountain near the head-waters of the White River. This layer was observed in one place on Lewes river to rest upon stratified sands a few feet thick, which in turn overlies a mass of drift logs still quite sound and undecayed. That the eruption was on a great scale is evident from the extent of deposit. Then again, the Yukon has no tributaries of any size on the left bank below the Takeena for a great distance, with the solitary exception of this White River, which fact, taken together with the general appearance of the country in that direction, as seen by Dr. Dawson so far as he was able to overlook it, seem to show that the basin of this river must be comparatively low. Moreover, since the coast ranges in British Columbia and Alaska cause a belt of very dry climate to exist immediately in their lee (where I might mention that artificial irrigation is necessary to agriculture), and as the St. Elias Alps are exceptionally high and snowy, this White River country should prove exceptionally dry and possess many remarkable features.

On the conclusion of the paper, *Alaska and the Yukon*

Dr. J. RAR said:—I regret to say that I have not been in that part of America of which Mr. Karr has given us such a pleasing and instructive account. The places that I have visited have nothing of those characteristics, with the exception of parts of the Rocky Mountains, where I have travelled a little; but I think Mr. Karr does not allow sufficient advantage to the sledge. To my mind it is easier to haul 150 lbs. on a sledge than to carry 50 lbs. on your back, particularly over snow. The weight on the back sinks one down into the snow, while the sledging is a much

previous triangulation the most accomplished. Our Admiralty chart shows a distance of 16,754, D'Agelot to me not to exceed

the most interesting part of the topography far exceeds the various explorations. Owing to the extremely good sources are practically

in the neighbourhood of the head of the river. I am aware that the topography, as well as myself, is of that country.

The country is interesting and comparatively level, deposited over a large area. Dawson in 1887. The mountains show that it was once a part of Mount Wrangell at the mouth of the White River. This layer is upon stratified sands and is of drift logs still quite fresh. A great scale is evident in the Yukon has no tributaries for a great distance, with the fact, taken together in that direction, as seen by the mountains, seem to show that the country is low. Moreover, since the cause a belt of very dry weather I might mention that and as the St. Elias Alps in that river country should prove the features.

been in that part of America and an instructive account. The characteristics, with the exception of the mountains, led a little; but I think Mr.

To my mind it is easier to go back, particularly over snow, while the sledging is a much

more easy process. For instance, on one occasion I hauled a sledge carrying 60 lbs. or 70 lbs. for 1100 miles, and our average day's journey was 24 miles. The snow was in fairly good condition, and we came back well. If I had been carrying that weight it would have been very difficult. I am sorry I can give no information as to work over such a very rocky country as Mr. Seton-Karr speaks of, with one exception—i. e. travelling on the west coast of Melville Peninsula, where it was impossible to haul a sledge, and we had to carry on our backs everything we required to use. Fortunately we had no tent to carry, because on these occasions I always built a snow-house, which saved an immense deal of labour, and with a single blanket in such a house one could always keep warm, even in the coldest weather. My men were all able sledge-haulers and carriers of the Hudson Bay Company. That was the most severe work I ever had in carrying a heavy load (about 500 miles) over a rough country. I trust you will excuse my making these few remarks.

Mr. DOUGLAS FRESHFIELD:—I look round the room and see with regret that Mr. Topham, who read a paper last year on Mount St. Elias, is not present. I have myself no claim to speak from any personal acquaintance with the North American Continent. But I may, perhaps, say a few words on two matters that have been touched on by Mr. Seton-Karr to-night. He speaks of the curious sudden floods in the glacial streams. They may probably be accounted for in the same way as the floods from the Aletsch Glacier, which arise from the bursting of the Marjelen Sea—i. e., by the sudden breaking open of glacial lakes, many of which were noticed by Mr. Topham.

Mr. Seton-Karr has also told us that the last American expedition has knocked 4000 feet off the head of Mount St. Elias, which we had believed to rise 18,000 feet above the sea-level. Now, I do not think we ought to acquiesce hastily in this diminution of Mount St. Elias. Mr. Dall, the surveyor who is responsible for the original survey, has stated that his height does not depend on one observation but upon several. The matter is being entered into fully in America, and is at present *sub judice*. I would, however, point out that another surveyor, Mr. Allen, measured the neighbouring Mount Wrangell, and made it over 18,000 feet. Mr. Topham took a series of measurements on Mount St. Elias, and having climbed above 11,000 feet, estimated that the peak rose at least 6000 feet above him. I know a great many climbers who have under-estimated the height of a mountain above the point which they have reached, but I have never known a climber who, having only 2000 feet above him, has estimated it at over 6000. It is against probability and human nature that a climber should do so, and I shall believe in the greater height until we have much better evidence to the contrary. There is another argument in favour of Mount St. Elias. The recent attempt to reduce the height of the Mexican volcanoes to 15,000 feet has failed, and they have been restored to their old height of over 18,000 feet. In fact, it was perfectly clear to anyone acquainted with the climate of Mexico that the mountains must be above 15,000 feet in height in order to account for the glaciers upon them. With all respect for the ability of American surveyors (which, it has been said, has reduced one mountain to a depression in the earth's surface), I still hope that we may long be able to look upon Mount St. Elias as the mountain with the greatest sweep of glacier on the face of the globe.

The PRESIDENT:—I think most of us are very much obliged to Mr. Seton-Karr for having taken us for one night at least away from Africa. He has long been favourably known to the Society, and to-night he has read to us a very interesting paper. I trust that he will have the good fortune at some future period to be able to return to Alaska, of which he is much enamoured, and to make even greater discoveries than he has already made. You will, I doubt not, wish that I should, in your name

and my own, express our most sincere thanks to him for what he has given us to-night.

Mr. SETON-KARR:—I am very much obliged to you for your kind thanks. I agree with Dr. Rae about the sledging, and think his journey of 500 miles a very wonderful achievement, and one which bears out what I have said as to the necessity of Indians in Arctic American travel. I have seen a communication from the surveyor who made Mount Wrangell 18,000 feet, made since his measurement, in which he reduced the height somewhat. Mr. Freshfield alluded to the American volcanoes. From Alaska I came home by way of Mexico in order to see these volcanoes, and ascended Popocatepetl, but was unable to go up "Orizaba," and quite agree with him that they are quite as high as originally stated.

