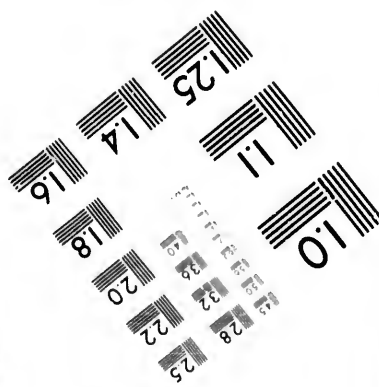
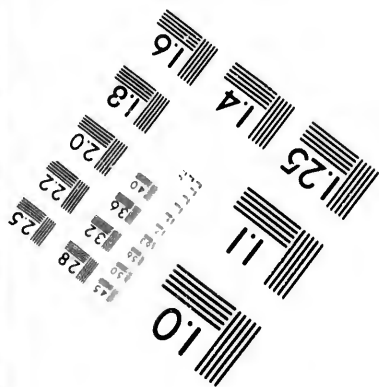
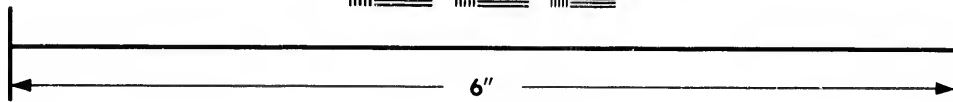
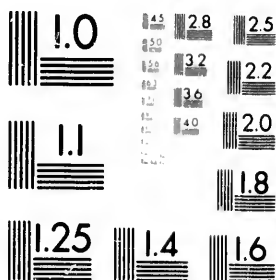


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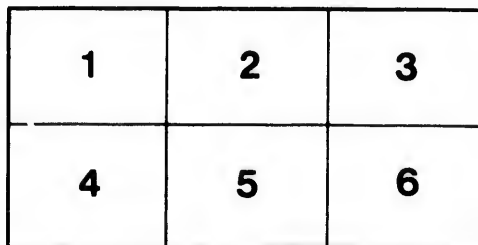
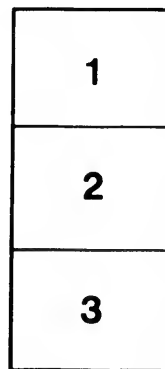
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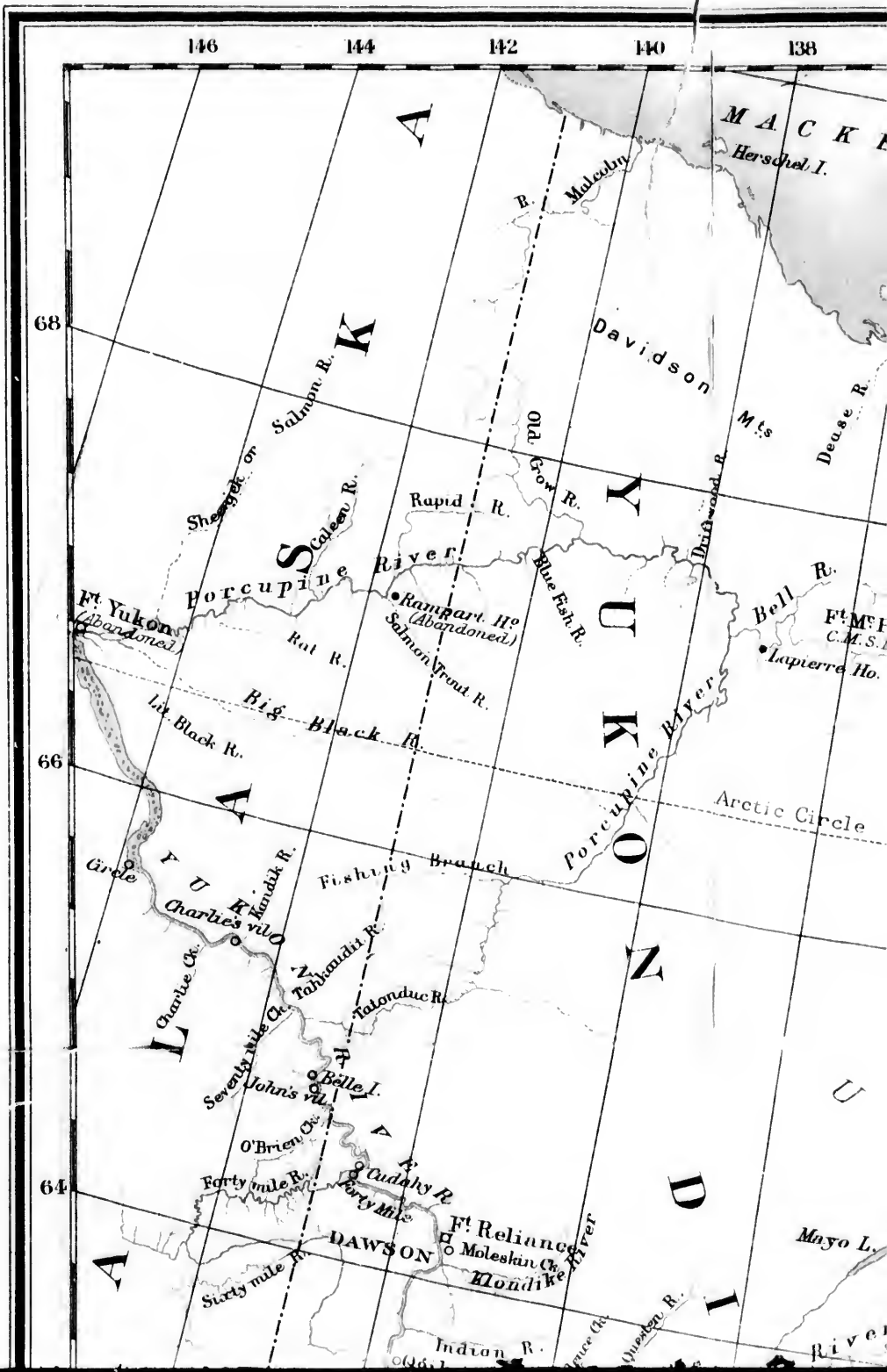
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1872

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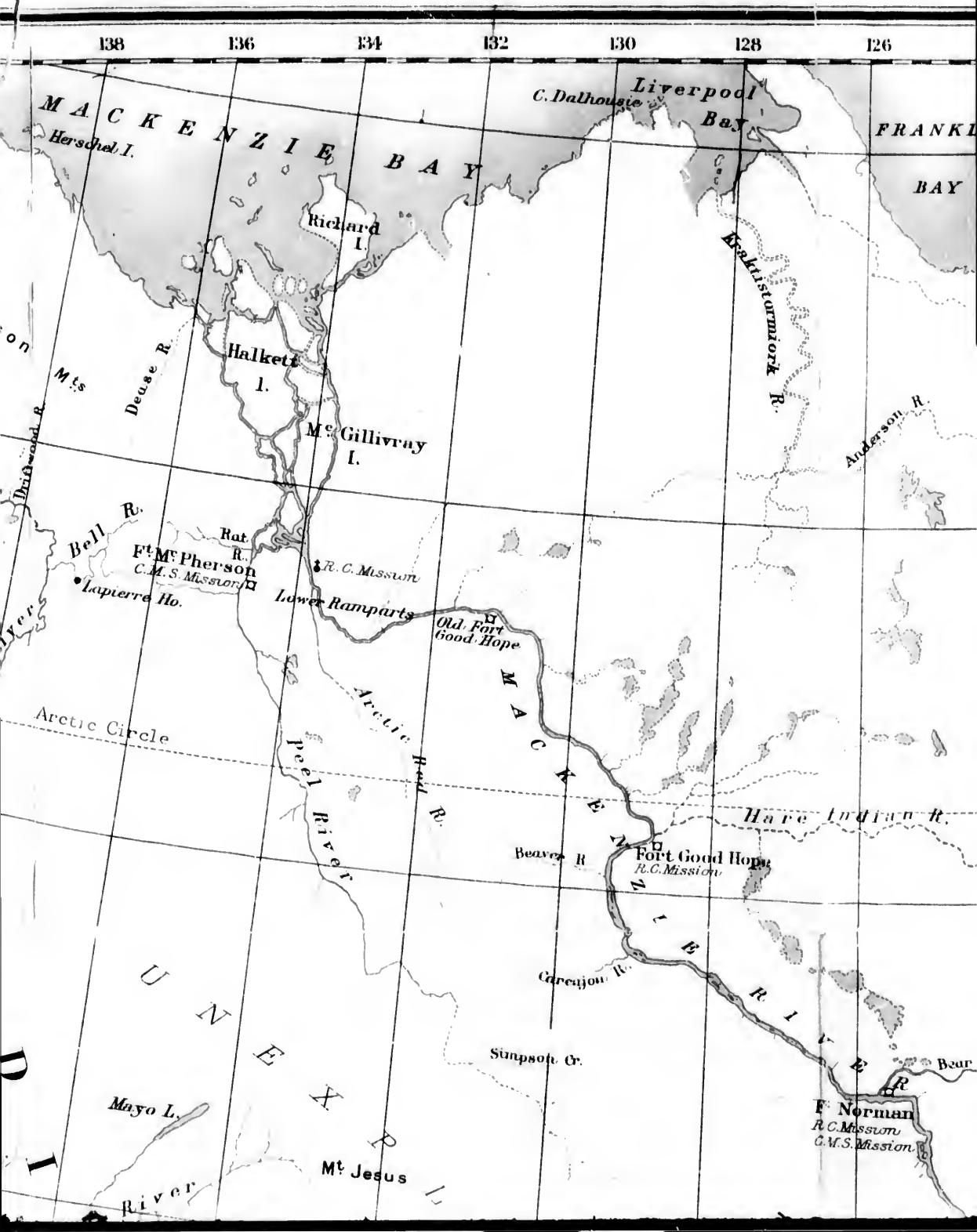
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# THE NORTH-WESTERN PART OF

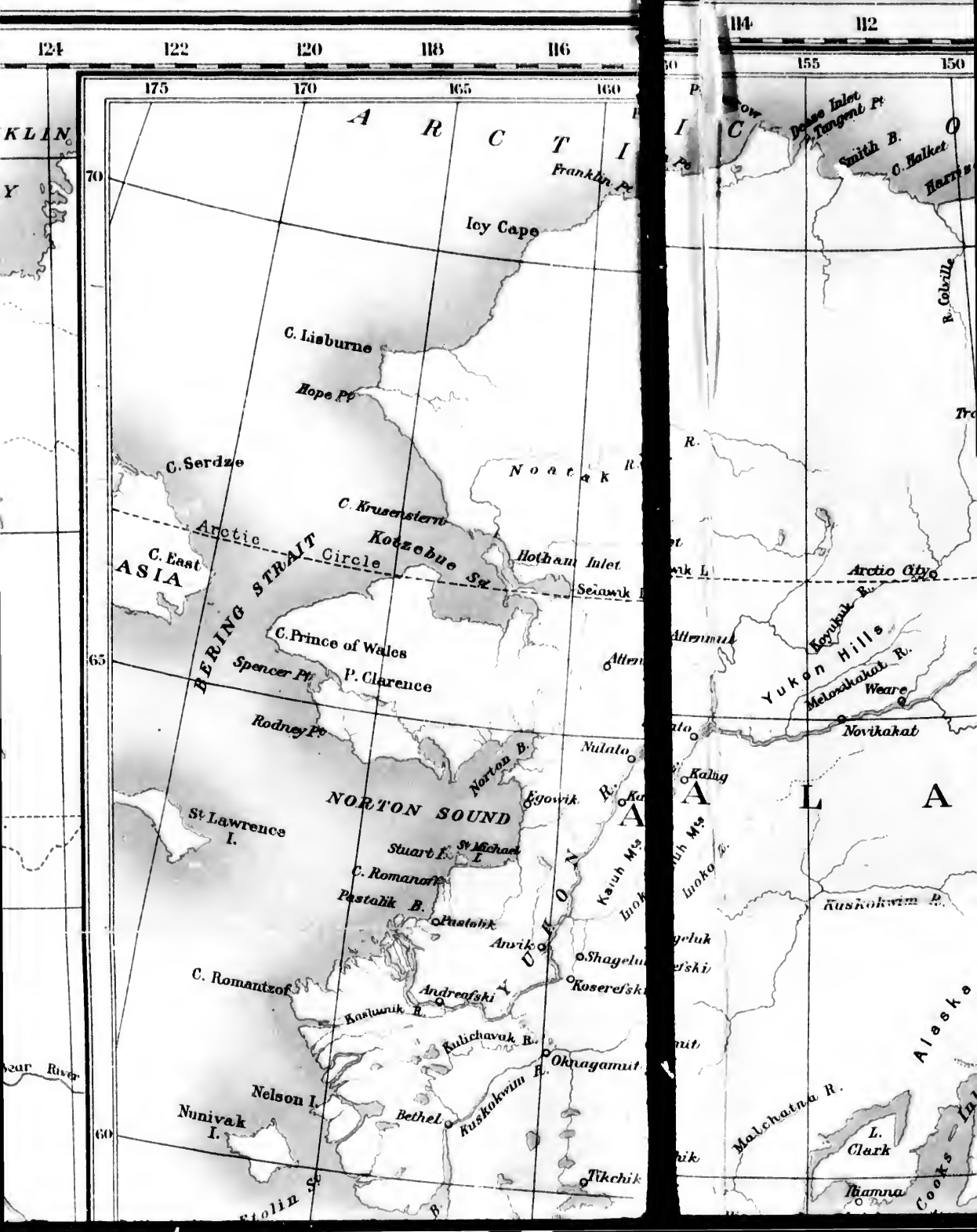
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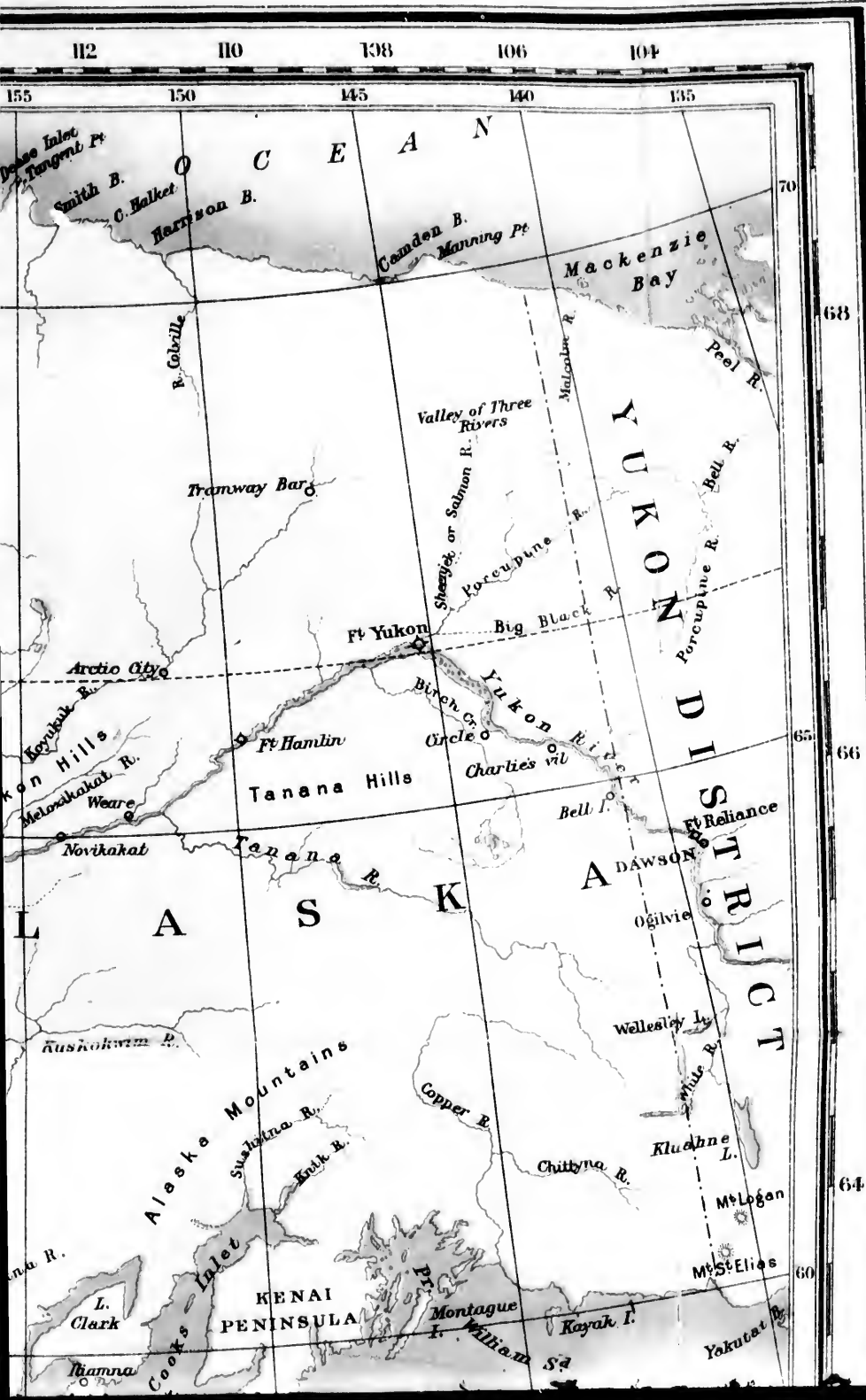




# OF THE DOMINION OF CANADA.

the Surveyor-General, Ottawa, 1898.





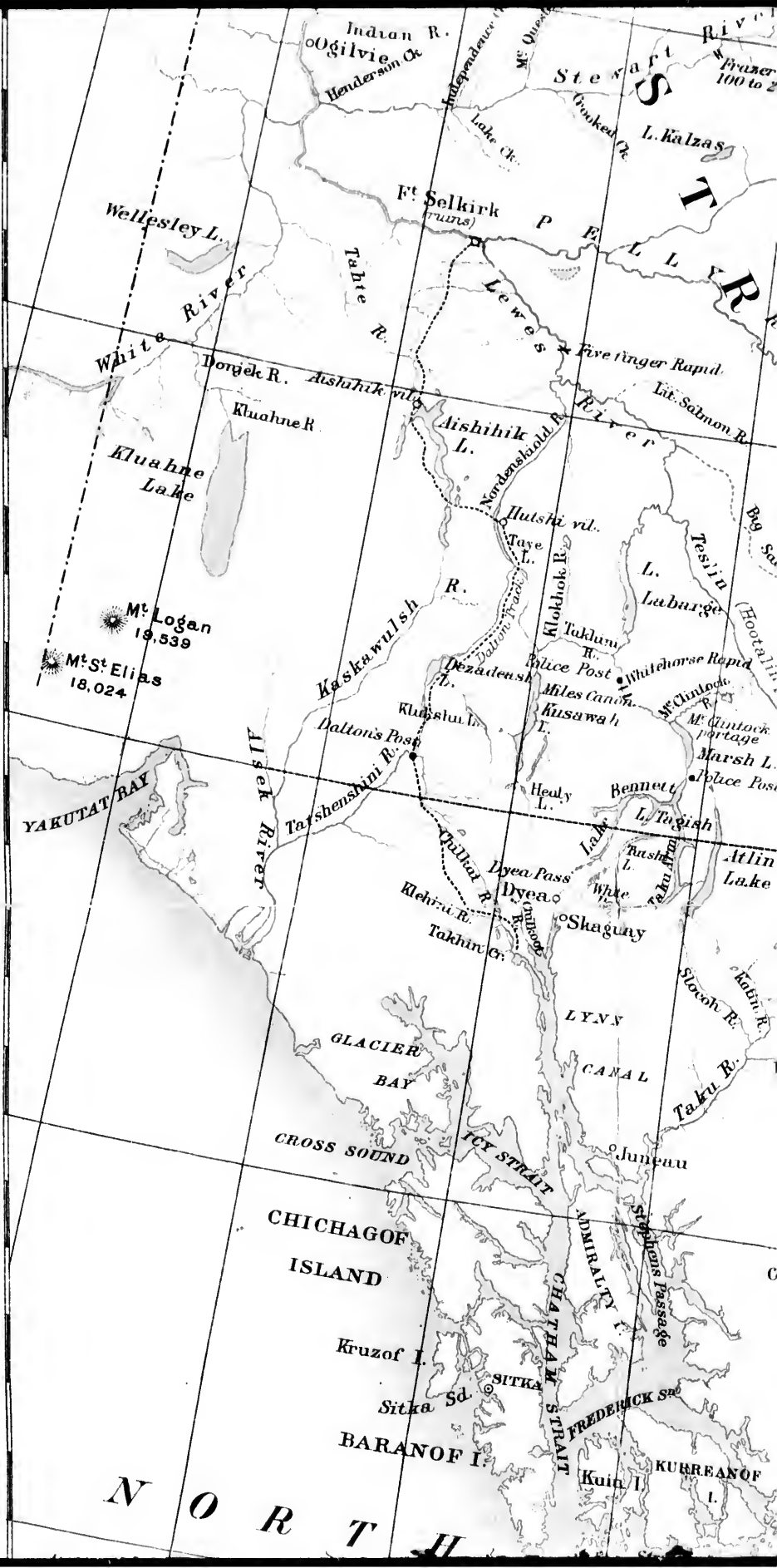
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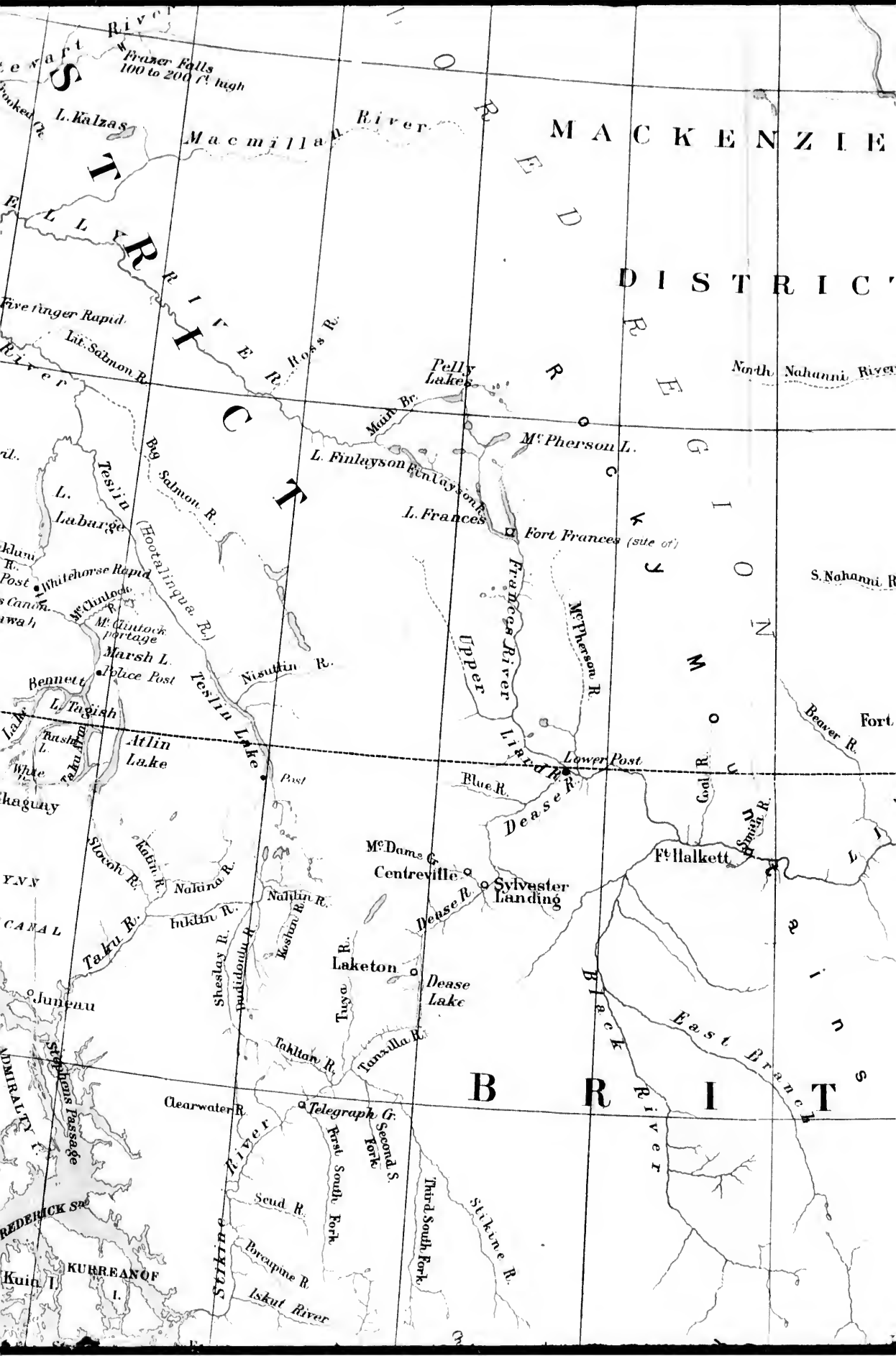
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62  
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58  
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Fraser Falls  
100 to 200 ft high

# MACKENZIE

# DISTRICT

# YUKON

North Nahanni River

McPherson L.  
L. Finlayson  
L. Frances

Fort Frances (site of)  
Upper  
Lower Post

Blue R.  
Dease R.  
Coal R.  
Beaver R.

McDame C.  
Centreville  
Sylvester Landing  
Fellkett

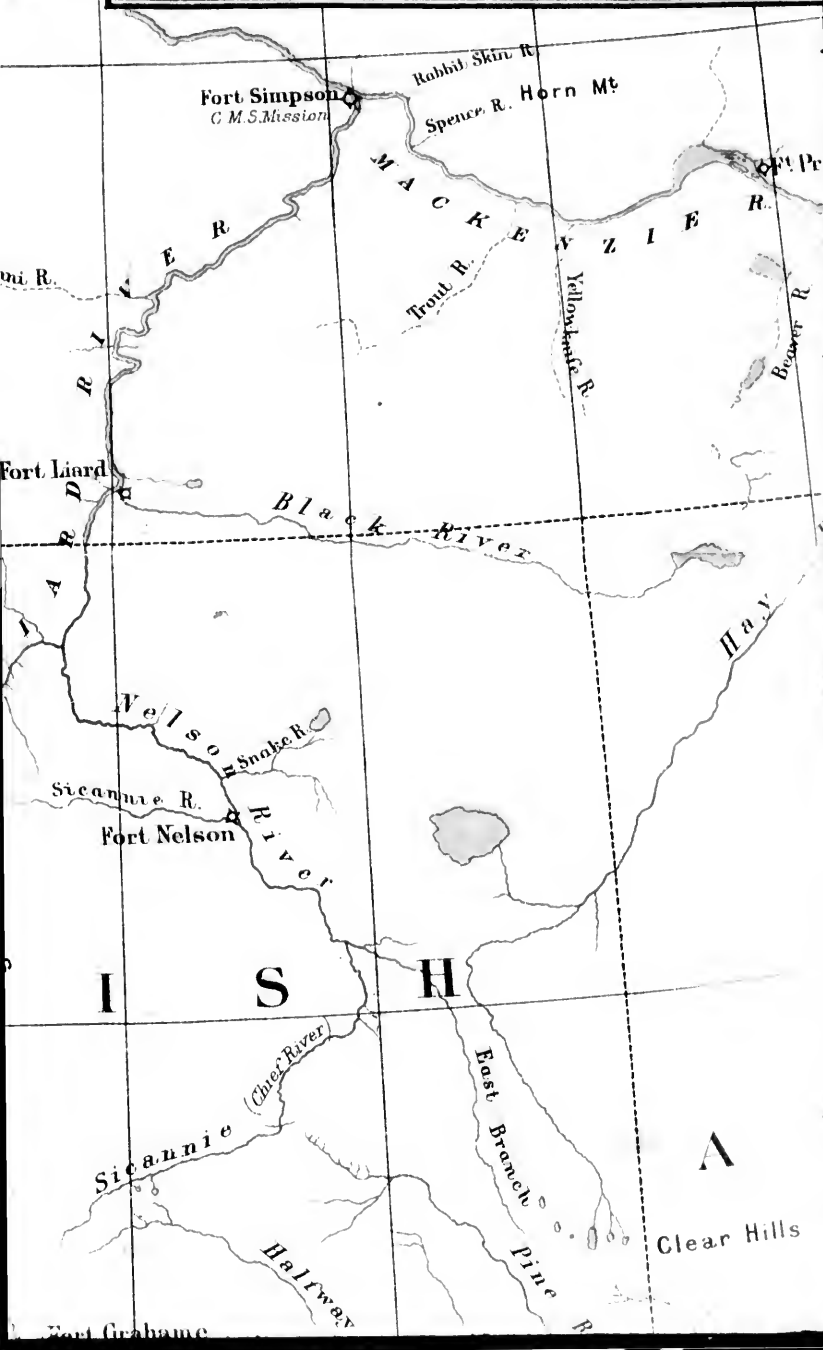
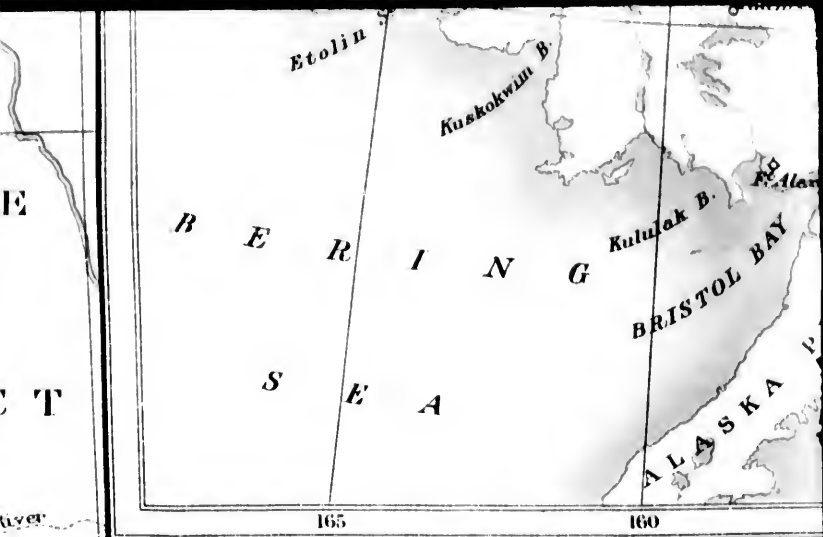
Laketon  
Dease Lake  
Black River  
East Branch

# BRITISH

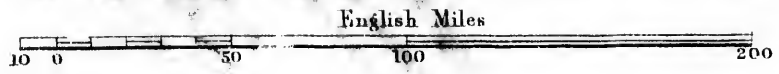
ADMIRALTY  
REDECK SEA  
KURREANOF

Clearwater R.  
Stikine River  
Telegraph Cr.  
Second S. Fork  
Third South Fork  
Seud R.  
Brewpine R.  
Iskut River

Stikine R.

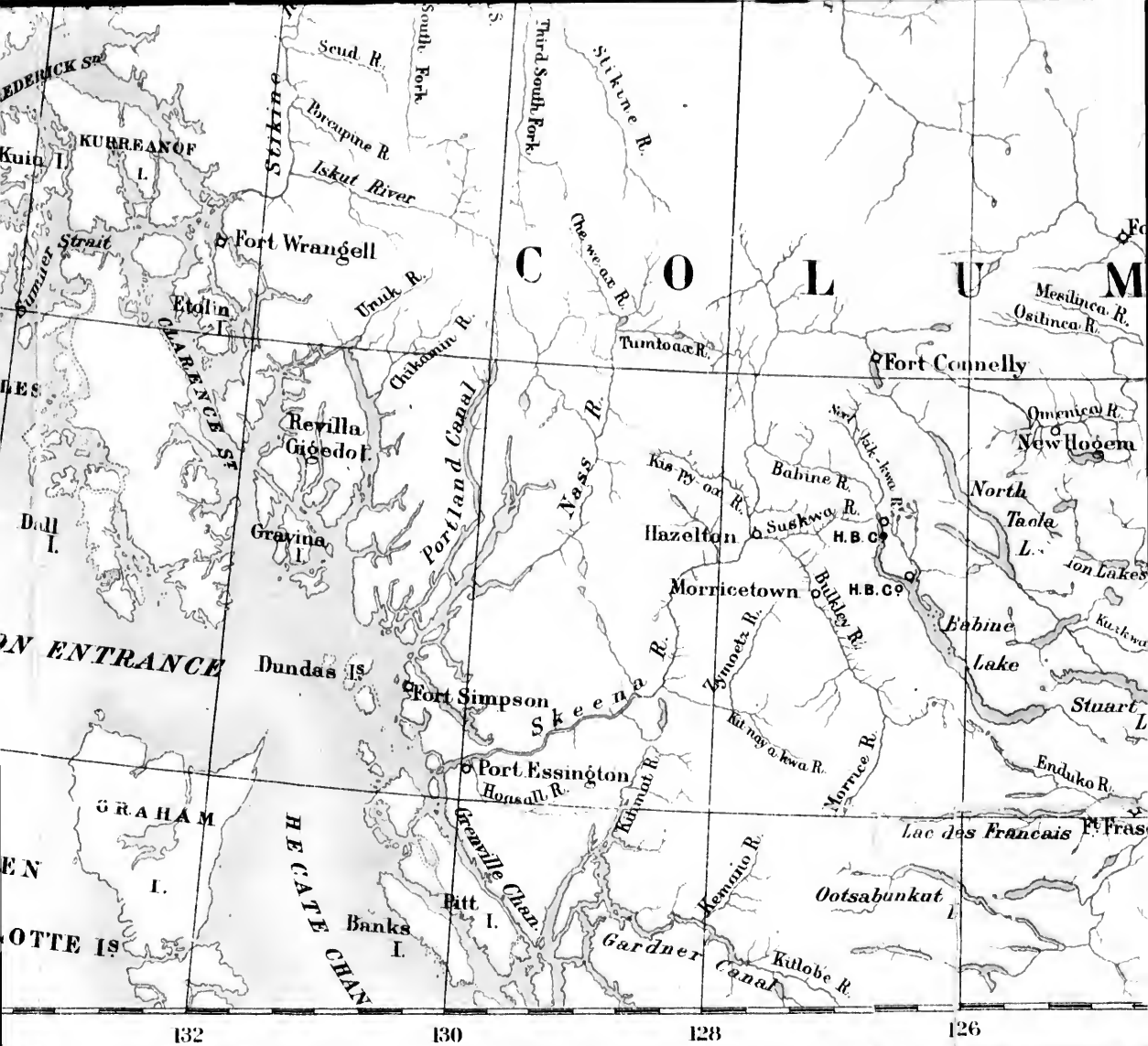






Natural Scale

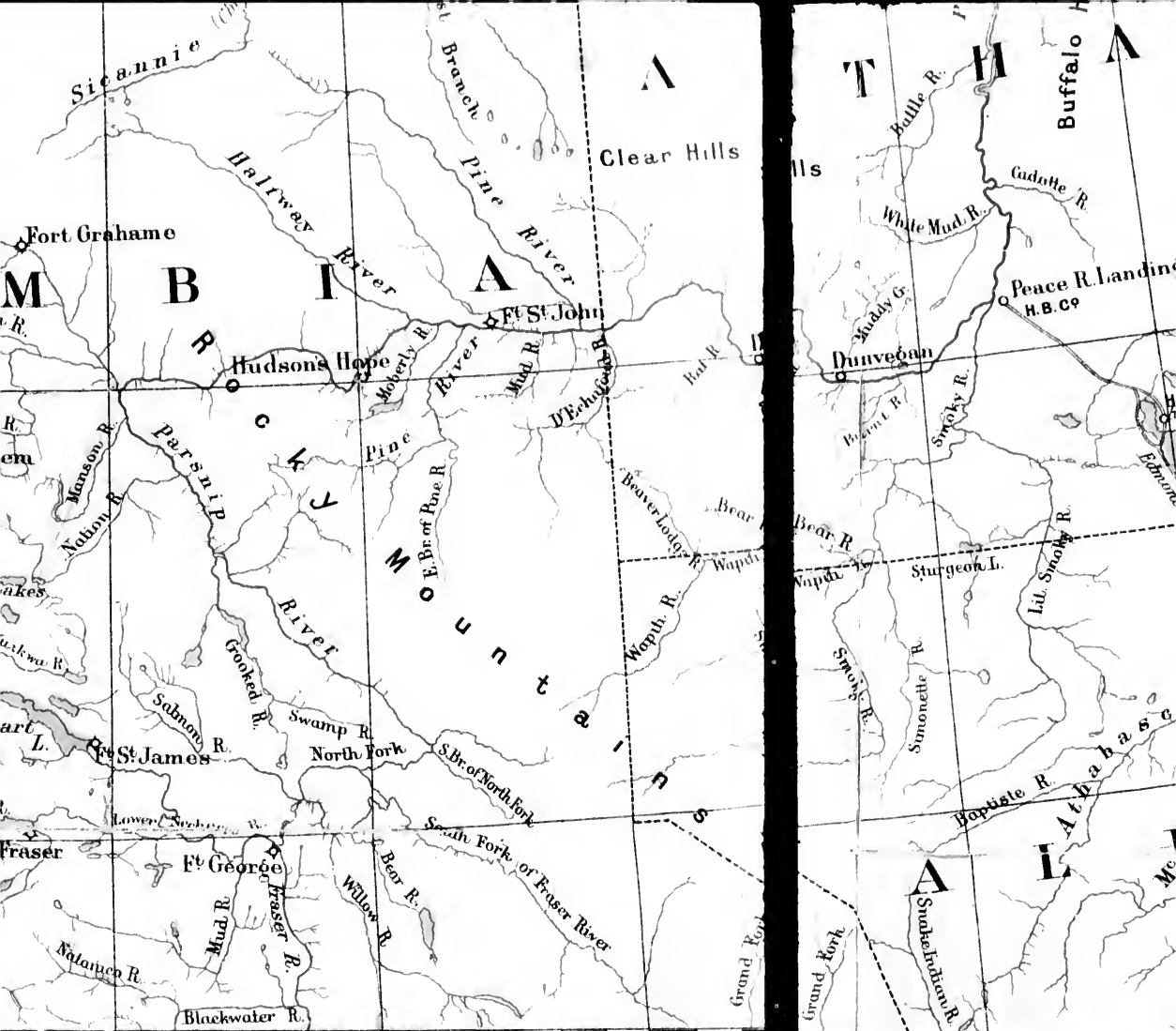
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Natural Scale 1:4,000,000 or 1 Inch = 63.13 miles

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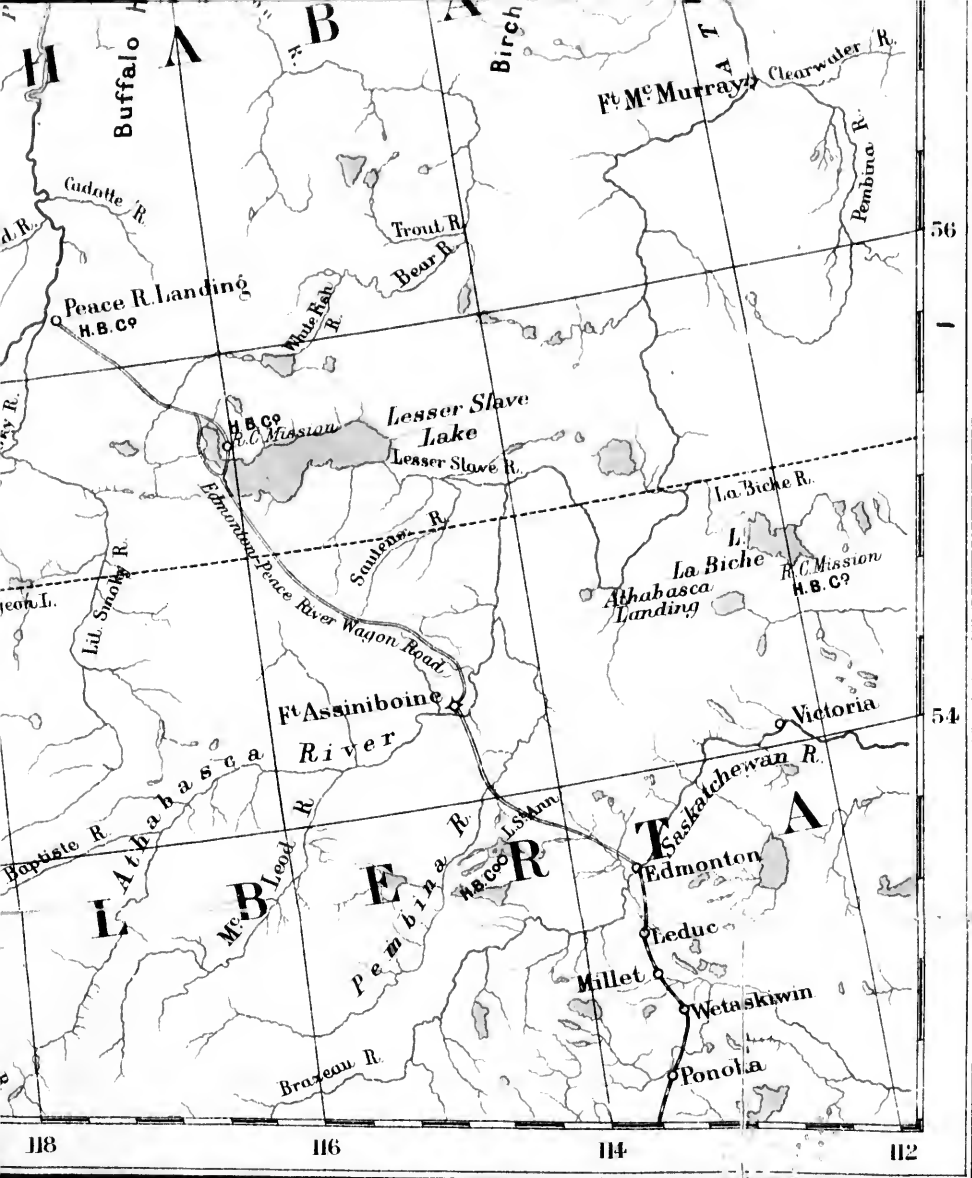


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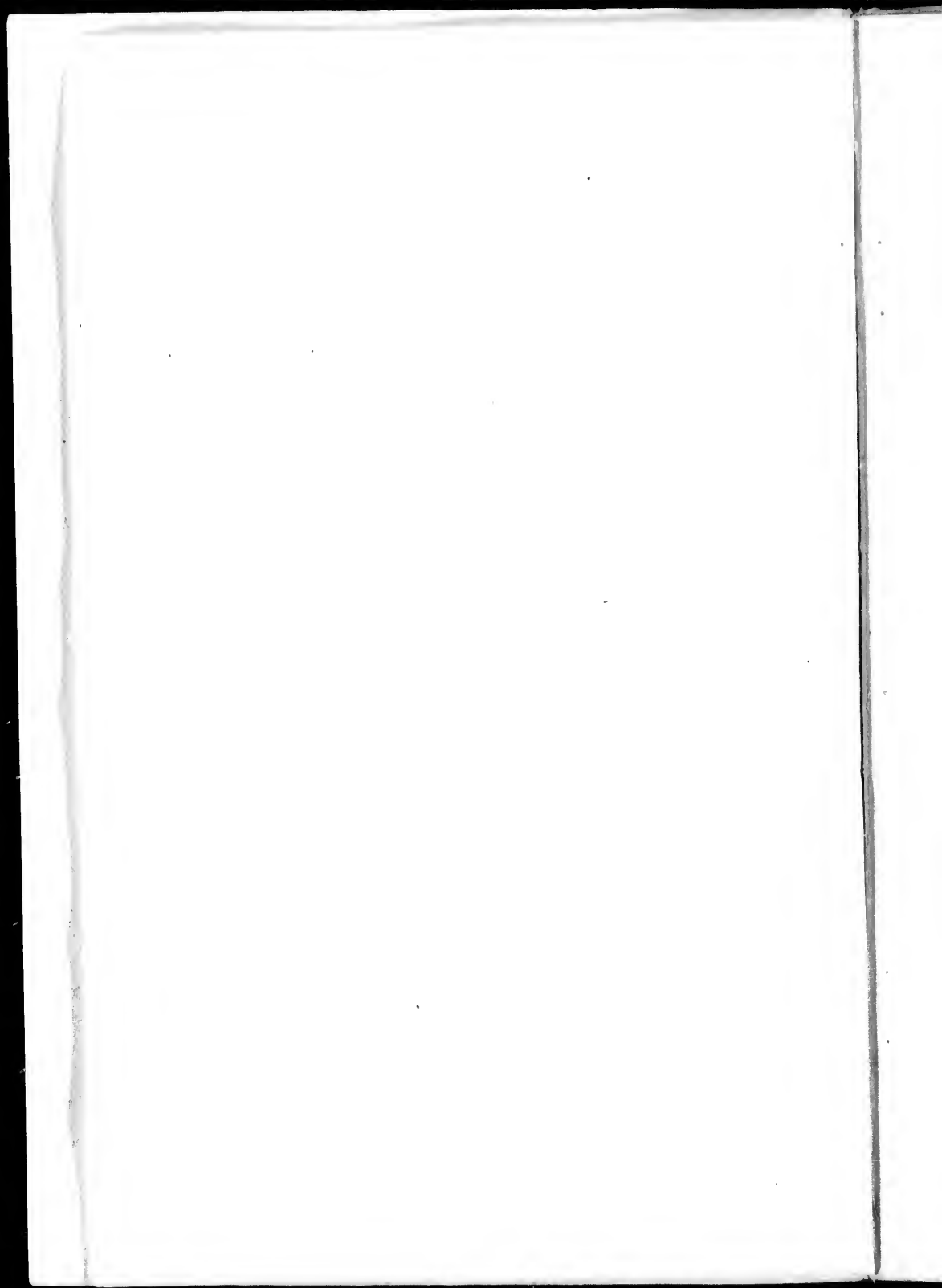
118



Lithographed by W. & A. K. Johnston, Edinburgh & London.



EXCERPT FROM THE JOURNAL AND PROCEEDINGS OF  
THE ROYAL GEOGRAPHICAL SOCIETY, 1, SAVILE ROW;  
FRANCIS EDWARDS, 83, HIGH STREET, MARYLEBONE, W.



That dealing with the early maps, on which the results of the Portuguese voyages were shown, deserves special mention, a useful feature being the reproduction of portions of Cantino's and Canerio's charts of 1502, as well as of an anonymous map, probably of the same date, in the possession of Dr. Hamy. Although portions of Canerio's map have been reproduced in more than one collection, we believe that the Asiatic section has never previously been published.

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### THE GEOGRAPHY AND RESOURCES OF THE YUKON BASIN.\*

By WILLIAM OGILVIE, of the Topographical Survey of Canada.

AFTER the kind things that have been expressed towards myself by the President, and endorsed by you, I feel somewhat put out. I feel that I cannot conscientiously apply them all to myself; I will therefore accept them as being offered me as the representative of the country whence I come, a country that I am proud to tell you is more British, perhaps, than any other part of this vast empire. A few years ago, perhaps a generation ago, that feeling was not exhibited to the same extent that it is now. Then it might have been compared to a small stream gently meandering through the land, and affecting all that it came in contact with; now it is a resistless torrent sweeping everything out of its way, and permeating the whole of the country with a thoroughly British feeling, and making us take a pride in being part of the British Empire, and glorying in the history and traditions of the British Empire, a much as you who are listening to me.

There is a common saying that blood is thicker than water. So it is; but there is a substance that, unfortunately, many people consider much thicker than blood and much heavier than water, that is, gold. I have come to speak a short time this evening on that subject in connection with the Yukon district, and to do so, I shall have to deal first of all at some length with the geography of the Yukon basin. I hope I shall not weary you, but it will take me some time to get through, because it is a very long river, so long that you might wrap it round this little island, and then tie a knot with the ends. After that I will make a few remarks about the gold deposits, their extent and probable development; after that, a few remarks on the habits and customs of the people; and then on the weather, and I would recommend you all to put on your wraps before I read the temperatures that have been observed there. Then I have some fifty odd slides to show you, exhibiting the surface features of the country from the head of the Yukon to its mouth, and these pictures will show you better than any word-pictures of mine, the surface of the country.

The map shows you Alaska proper. The dotted line is the 141st

\* Read at the Royal Geographical Society, March 23, 1898. Map, p. 112.

meridian west of Greenwich. It is the international boundary-line between Canada and Alaska. My first visit to the country was made in order to determine where that meridian crossed the Yukon river, and in connection with this I made a survey from the head of the Chilkat inlet, across the mountains to the lakes at the head of the Lewes river, and down that river to the boundary.

Now we will begin at the Dyea pass, taking the Lewes branch first, afterward the Teslin river, and then the Pelly. Beginning at tide water on Dyea pass, we make our way about 8 miles up the valley of Dyea river over the moraine of an ancient glacier; then we have about



LOOKING NORTHWARD AND LANDWARD FROM PENINSULA BETWEEN CHILKAT AND CHILKOOT INLETS.

(Photo by J. J. McArthur, D.L. Surveyor.)

3½ mi. to make our way through woods, where there is now a road cut, to Sheep camp, about 1000 feet above sea; from there to the summit, about 3 miles, we ascend 2600 feet. No part of it is very steep until you get near the summit, when there is about 500 feet which has a slope of from 35° to 40°. The first time I walked over, I carried my chronometer in one hand, a magnetic dip-circle in the other, a barometer on my back, and some other instruments of less importance. You have, no doubt, seen this pass pictured as being almost perpendicular at some points. I have not seen those places yet, and I have gone over several times. Down to Lake Lindeman we descend 1350 feet, and

travel  $8\frac{1}{2}$  miles from the summit. Lake Lindeman is about  $4\frac{1}{2}$  miles long. We descend it, and then cross a sandy ridge, a little less than a mile, to Lake Bennett, which brings us to the head of the navigable waters of the Lewes branch of the Yukon river. Lake Bennett is  $25\frac{1}{2}$  miles in length; midway there is a branch which strikes off to the south-west, which is about 14 or 15 miles long; heading in some of the glaciers of the coast range. At the foot of Lake Bennett we reach what is called Cariboo crossing; it is about  $2\frac{1}{2}$  miles long, and out of it we go into Tagish lake, 17 miles in length. At the foot of this there are 5 miles of a small river, averaging 100 yards in width, and from 6 to 12 feet



LOOKING NORTH-WESTWARD ACROSS DYEA AND CHILKOOT INLETS.

(Note by J. J. McArthur, D.L. Surveyor.)

deep. Passing it, we arrive at Marsh lake, 19 miles long, with good water all the way through. At the foot we strike the river proper, and go down it  $25\frac{1}{2}$  miles to the cañon. The cañon is about 70 to 90 feet wide. The walls are of basaltic rock, and about as high as it is wide. The stream is so swift that you run through it,  $\frac{5}{8}$  of a mile, in about three minutes. At the foot is a rather rough rapid, and after running through a pond-like expanse in the river below this rapid, you make a sharp turn to the left, and then to the right, and that brings you to the White Horse rapid, which is the only dangerous spot in the river. A great many have run through it safely, but many have lost their lives there; I traced thirteen deaths by drowning in 1895 at this point. Fourteen and a half miles below the White Horse a river joins, called



Takhina, or in English, Mosquito river. This joins from the west, and flows out of a large lake about 30 miles above its mouth. Thirteen and a half miles below that we reach Lake Labarge, the largest lake on the river, 31½ miles long. Out of that we make our way down what is known to the miners as the Thirty-mile river to the mouth of the Teslin. Most of that reach of 31 miles is a very rapid current, and there are several big rocks in various places; but they are not formidable, because they are easily seen, and you can avoid them.

Now we will go back to the coast, and go over the much-discussed Teslin route. The Stikine river has been navigated by boats for over twenty years. There is a small steamboat which plies up that river to Telegraph creek, about 150 miles, every year making several runs. In 1896 and 1897 the Hudson Bay Company's steamer *Caledonia* made four trips from Port Simpson up through the coast tidal rivers to the mouth of the river—two in '96 and two in '97. These voyages were made in the best season of the year, no doubt, when there was plenty of water in the river; but I do not think there is any doubt whatever but that that river can be navigated by light-draught stern-wheel steamers during open water—that is, from the middle of May to the middle of November. It is said, and it has been discussed very much at length, that trouble will be raised at Wrangell over the transfer of cargo from the ships to the boats. If it is, we can unload at Simpson, in British territory, the only objection to this being that you have to cross Dixon's entrance in a river steamer, and a strong wind makes it too rough, and such boats would have to abide the event of the weather for departure from and return to that port. With this probable detention, we can ply from a British port to a British port, and the only part of foreign territory that we have to traverse is the coast strip which the Americans claim—is 34 miles in width, which width we do not admit. It is 170 miles from Simpson to Wrangell in ocean water, and from Wrangell to Telegraph creek 150 miles on the Stikine river. From Telegraph creek overland to Teslin lake is about 150 miles of tolerably easy country—that is, when you compare it with the rest of that country, which is very mountainous. It would not be called easy here; nevertheless, by next autumn the probabilities are we shall have a railroad from Telegraph creek to Teslin lake. Now, the lake was surveyed last fall by one of our surveyors, Mr. St. Cyr, and my son. It is 65 miles in length, and from ½ to 2 miles in width, and from the foot of the lake down the Teslin river (known to the miners as the Hootalinqua) is 135 miles to the junction with the Lewes. From there we continue 36½ miles to Big Salmon river, which is an unimportant stream, only of note in the sense that gold has been found all along it, not in large quantities, but still it is there. It has been explored up to Quiet Lake, an estimated distance of 200 miles, and the lake is reported 24 miles long, but it is probable this is much in excess of the true

distances. From Big Salmon river to Little Salmon river is about 36 miles, and from there to Nordenskiöld river is about 29 miles.

We will now go back again and take the Dalton trail, beginning at the mouth of the Chilkat river, and going up it to its confluence with the Klehini river, joining from the west, up which we go some distance; and then take overland over a succession of low passes, said to be about 3000 feet above sea-level. Ninety-five miles from the coast you strike the summit proper—that is, the summit of the watershed between the Alsek river and the streams flowing into



LOOKING DOWN CAÑON FROM HEAD.

Chilkat inlet—and from there you have an easy undulating country to traverse until you strike the Lewes river near the mouth of the Nordenskiöld river, some 130 miles below Teslin river. A short distance below the Nordenskiöld is the principal obstruction in the river—that is, when we descend by the Teslin branch—known to the miners as the Five Finger Rapids, and to the coast Indians as the Yeth Katzi, or the Raven islands, because there are five masses of rock or islands standing in the channel, on which those birds nest. The river has worn its way through a barrier of conglomerate rock, part of which now remains on both sides, and left these five masses standing in the stream. The ravens make their nests there because they are protected from the depredations of animals. The local or Tagish Indians call them Chi Cho, or big

rocks. From the Five Fingers down to the mouth of the Pelly is about 57 miles, or 375 miles from the head of Bennett lake, by way of the Dyea or White pass, and through the cañon, White Horse, and Five Fingers. To the Pelly by way of the Teslin route is 387 miles from the head of Teslin lake, with only one hindrance to easy navigation—the Five Fingers. With these interruptions both those routes are easily practicable; the first from the head of Bennett lake, the last from the head of Teslin lake.

The Five Finger rapids are not more than a detention, for any ordinary river steamer can ascend them with the aid of a line, or warping, as it is termed. A line is fastened to some point on the shore ahead,



LOOKING DOWN "WHITE HORSE" RAPIDS.

and the boat helps to pull herself up by hauling on this line with her steam capstan or winch. The detention is caused by the water being dammed by the rocks mentioned. This raises it somewhat, and there is a short plunge of from 1 to 2 feet down to the level below. This plunge does not extend over more than a score of yards. Both above the rapids and below there are several miles of strong current, but not enough to prevent steamers ascending it; and once past this, there is no trouble up to the head of Lake Teslin by the Teslin route, or up to the White Horse rapids on the Lewes, 220 miles above Five Fingers and 97 below the head of Bennett lake.

Now, the Pelly was examined and surveyed by Dr. Dawson in 1887.

the same year that I made the instrumental survey of the Lewes. He made his way up the Stickine, across to Dease lake, and down the lake and the river of the same name to the Liard river, up which he went to Frances river, ascended it and the lake of the same name, and crossed the watershed of the Liard and Pelly to a point on the latter in  $61^{\circ} 49'$  N. lat. and  $131^{\circ} 51'$  W. long. From this point he made a survey down the Pelly to its mouth, 320 miles.

From the mouth up he reports it navigable for river steamers to Granite cañon, 61 miles up. This cañon is about 4 miles in length, and a steamer might have difficulty in ascending it owing to crooks, but



BIRD'S-EYE VIEW OF SITE OF "DAWSON" AT MOUTH OF KLONDIKE, APRIL, 1897.

he thinks by warping she would succeed. Nine miles above the cañon the Macmillan river joins from the north-east. Above the cañon the doctor is of opinion that a smaller or lighter draught boat could ply up the Pelly to Ross river, about 250 miles above the junction with the Lewes; and probably the same steamer could ascend the Macmillan 40 or 50 miles.

From Fort Selkirk, or what was Fort Selkirk, the old Hudson Bay trading post a mile below the mouth of the Pelly, down to White river is 96 miles. White river joins the Yukon from the west, and a great part of it is in our own territory, but much of the head is in Alaska. This river branches some 25 or 30 miles above the mouth, and the north branch heads close to Sixty-mile and Forty-mile rivers. The other branch

is reported to head in a very large lake north-east of Mount St. Elias, named Kluahne lake. Another branch is reported to head south-west of this in another large lake. Copper is reported on the upper stretches of this river, but has not been located yet. Ten miles below White river, Stewart river joins from the east. It is reported to be navigable for light-draft steamers up to the falls, about 150 miles, as near as I can ascertain from the reports of miners. One or two of the branches of this stream may afford another 100 miles of navigable water for the same class of steamers. One of them heads in a lake called Mayo lake, reported about 25 miles in length, but narrow. From the Stewart to Dawson is 69 miles, all good navigable water. From Dawson to the boundary-line is about 90 miles, all of which is good too. From the boundary-line down to the Yukon flats, about 130 miles, at the head of which is situated the Alaskan mining town Circle City; the navigation is good, but in the flats it is often bad, especially in low water. These flats extend nearly 100 miles, and were at one time the bed of an extensive lake, now filled with innumerable islands and channels; most of those channels are impassable for boats, and those channels that are passable are continually changing. In 1895 the record season was accomplished, that is, one of the steamers made five trips from the mouth of the river to Forty-mile, which was then the highest point on the river at which trade was done, estimated to be about 1500 miles above the mouth. In 1896 the same boat made four trips; in 1897 some only two, and some three. The trouble was, the water fell so rapidly in August, that in the steam-boat channel there were only 22 inches of water. The result was they lay there from the middle of August until October, and some are still in that vicinity. Two of them got up with very light loads to Dawson, and the non-arrival of the others was the cause of the threatened starvation there, which I am happy to say was nearly altogether baseless; there never was any serious fear of extensive starvation. After getting through the flats, we make our way down the river without any trouble until we get some 900 or 1000 miles farther down, where the river begins to spread out again, and often there is difficulty, on account of the many different channels; and when you get into the delta you have much trouble again. The channel generally used is narrow, crooked, and shallow, and boats often ground in it. The boat I came down on lay on a bar in the mouth of the river a day before she could get off. When we were three days outside a mile or two at anchor before we could cross Berings sea to St. Michael's, which is some 72 miles off.

Now let me recapitulate. From the head of Lake Bennett on the Lewes branch to the cañon, 95 miles, all easily and safely navigable. The cañon and adjacent rapids,  $2\frac{1}{2}$  miles long, absolutely impassable for steamers; and from the foot of those rapids to the mouth of the Teslin,

90½ miles, some of which is strong current, but not impassable, and Lake Labarge, which might prove too rough at times for boats light enough for the river. From the head of Teslin lake, by the Teslin route, to the foot is 65 miles, and this lake too might at times prove too rough for light river boats, but it is not so wide as the other lake (Labarge) on the Lewes; besides, Teslin lake is more crooked, and thus affords more shelter from rough water than Labarge. From the foot of Teslin lake to Lewes river, following the course of Teslin river, is 135 miles, all easily navigable. From the junction of those two streams to the Five Finger rapids, 129 miles, is all easily navigable, and, as has been



LOOKING UP YUKON RIVER FROM NEAR DAWSON, 1870 FEET ABOVE RIVER, APRIL, 1897.

already intimated, those rapids are not serious. From the rapids down to the Pelly is 58½ miles of good river. On the Pelly, as already stated, we have 60 miles of ordinary steambot course, and probably 220 to 250 more for smaller steamers, with no break in its continuity.

From Pelly to White river, 96 miles, all good; the heaviest steamers now on the river have made several runs over it. Between White and Stewart rivers, 10 miles, there are no hindrances to the boats now navigating the Yukon. It is doubtful if the White can be navigated at all by steamers, as it is very shallow and swift at the mouth. Stewart, as already intimated, is navigable for about 150 miles by light-draught steamers, and some of its affluents will possibly afford 50 to 100 more. Between Stewart river and the International boundary-line, 158½ miles, no stream of importance joins. Summing this, we get

636½ miles of navigable water on the Lewes branch, exclusive of the cañon rapids, which are insuperable; 200 on the Teslin, about 300 on the Pelly and branches, and 200 on the Stewart. In all 1336½ miles, of which over 1200 we know to be navigable. From the boundary to the mouth is estimated at 1487 miles; it is all navigable with some difficulty at points as already stated. The Porcupine, about 210 miles below the boundary, will likely afford about 400 more miles of navigable water. It does not appear that the Tanana, the only other large stream joining the Yukon, is navigable any distance, but further examination may modify the reports so far received.

All this gives us over 3200 miles of fair navigation in the system of the Yukon river, of which Canada owns nearly 42 per cent. Taking the accompanying map, with those streams as they are marked on it, we have the Lewes branch and Yukon running from 59° 46' N. lat. and 135° 13' W. long., in a north-westerly direction for about 900 miles. It then makes a sharp turn to the left, running nearly west for about 720 miles, when it turns nearly south for about 265 miles, and then north-west again for about 230 miles, in all about 2100 miles in length. One remarkable feature in connection with this river is that it drains the interior of the peninsula of Alaska, and nearly cuts it in two, starting as it does less than 14 miles as the crow flies from the waters of the Pacific ocean at the extreme head of the Lewes branch, whence it flows 2100 miles in the manner indicated into the same ocean again, or Bering sea, which is a part of it. Now take the map attached to this paper, and with the watershed marked as we there have it—which is only approximate, because the streams are not all surveyed—and we find that the drainage basin of the river occupies about 338,000 square miles; Canada owns 149,000 of that, nearly a half, and of the river she owns less than a third, but that is much the most important part of the Yukon drainage basin. It contains the most wealth, as I hope to point out to you later on.

Now a few remarks on the gold-bearing area. The first location of gold, and the first gold bars that were worked to any extent, were on the Stewart, about 30 miles from the mouth. There was another place on the Lewes, midway between Teslin and the Big Salmon, known as Cassiar Bar, which paid well. Many other points along the Lewes also afforded good pay, and were worked for several seasons, until the discovery of coarse gold on Forty-mile river in 1886, which, becoming known, drew all the miners in the country to it. Coarse gold was discovered on Birch creek in 1891, which in 1892 originated Circle City in Alaska. In 1896 gold was discovered on Bonanza creek, a tributary of Troandik (commonly known as and called Klondike). The first name is the correct Indian one, and means Hammer creek, from the fact that they used to erect barriers across the mouth to catch salmon by hammering sticks into the ground.

By the way, I forgot, in the proper place, to mention the probable origin of the name "Yukon." The Indians along the middle stretches of the river all speak the same language, and they call the river the Yukonah, which in English is "the great river," or, in short, "the river," because it is the only river they know. Our Indians in the vicinity of Forty-mile call it "The-tuh." What that means I cannot tell you, and they laughed at my simplicity for asking when I tried to find out.

Gold was discovered on Bonanza creek, August 16, 1896; that led to the discovery and development of the celebrated Klondike region. Gold has been found on the Stewart up to the head. One man,



LOOKING ACROSS BONANZA AND UP ELDORADO CREEKS, APRIL, 1897.

Alexander Macdonald, prospected this river all the way up in 1886, and remained in that region alone during two different seasons. During the summer of 1887 he crossed to the headwaters of what is evidently a branch of the Peel, and prospected it for some distance down, and found gold in the gravel as far as he went; and in 1873, Mr. Arthur Harper, the pioneer prospector of the Yukon, found gold in the sands and gravels at the mouth of the Peel, which corroborates Macdonald's statement, for the geological formations near the mouth preclude the idea of gold there other than what has drifted down the river. From this we infer that a considerable portion of the upper Peel is also in the auriferous area. Several parties leaving Canada



this season are determined to test this, and I have no doubt but that it will be investigated ere many months.

Gold is also found on the Pelly. Miners have been prospecting there for years, but never got a great deal, though they generally got enough to keep them in supplies for a year. Big Salmon river was also found to be gold-bearing over its whole length. The Teslin river was prospected in 1886-7, and in some places very good indications found. I found gold on the Lewes when I went in 1887, up near Lako Labarge; I also found gold in the drift, well up on Bennett lake—very little, it is true, but enough to swear by. The celebrated Cassair district



JUNCTION OF YUKON AND FORTY-MILE RIVERS, WITH TOWN OF FORTY-MILE BETWEEN.

is south of the head of the Teslin, which was worked in the seventies. Along the head of the Liard river gold is known to exist. At Dalton's crossing of the upper Alsek or Tatshenshini river gold was discovered in 1896, by a man who was fording the stream on horseback; the brute stumbled and threw him into the water. Scrambling ashore through the icy water as fast as he could, he seized a small bush to help him up; it came away by the roots. The clay which came with it was washed in the rapid current, and he saw something bright, which he picked up and found to be gold. This he exhibited at Forty-mile on his arrival there some months after. Fine gold is also reported at a couple of points midway between this point and Selkirk, along the Dalton route, which is laid down on the accompanying map. Harper,

the pioneer already referred to, found light prospects along the White river, both branches of which he ascended some distance; but he was in quest of copper, which is often brought in by Indians from this vicinity, and did not pay strict attention to gold. The exact locality where they get the copper is yet unknown, but frequently they bring to the trading post quite large specimens of pure native copper, which they say they find along this river. Harper searched for and found some indications, but did not locate it.

Gold has been found on the coast at several points, notably at Juneau, in Alaska; at Ruby Sands near Lituya bay, about 50 miles west of



CONFLUENCE OF FORTY-MILE RIVER WITH YUKON, LOOKING UP BOTH STREAMS.  
YUKON 600 YARDS WIDE.

Cross sound, shown on the accompanying map, and south of the point where it was found on the Tatshenshini river about 100 miles. It is also found at other points further west along the coast, and we generally find it at points north of those places in the interior, from which we infer, with reason, that all the part of the Dominion north of British Columbia and west of the Yukon-Mackenzie watershed, except that part north of where the Yukon intersects the 141st meridian, is gold-bearing. Much of it, no doubt, is not rich, some of it we know is, and very much will pay well with better facilities for working.

Now as to its richness. The richest part is Trondik, better known as Klondike. On Bonanza creek, a branch of the Trondik, there are some two hundred claims, each 500 feet in length. I have no hesitation in saying that the middle hundred of these claims, that is, from about No. 60 below Discovery claim to No. 43 above Discovery, will turn out—

No. I.—JULY, 1898.]

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unless a very curious coincidence has occurred, and that is that every man has struck the only rich part in his claim, which is highly improbable—unless that is the case, I have no hesitation in saying that those claims will turn out £5,000,000. On a branch of the Bonanza—Eldorado creek—some eighty-six claims have been marked out, fifty of which I made a survey of. Forty of these were known last season to be good, and unless the indications are highly misleading, and the same coincidence has occurred again, each of those claims contains on an average 1,000,000 dollars, or £200,000. With the same indications in view, I have no hesitation in saying that those two creeks will turn out, before they are exhausted, 75,000,000 dollars, or £15,000,000. Take this little area drained by the Klondike—on one side only—and a part of Indian creek basin, about 35 miles in length, and less than 25 in breadth, unless the same coincidence has occurred again, we have 100,000,000 dollars, or £20,000,000 worth of gold in sight, and probably twice that amount before it is exhausted. On Forty-mile and on Sixty-mile, gold is found in abundance. Two of the tributaries of Sixty-mile river, Miller creek, and Glacier creek, are each about 5 miles in length, thus affording about fifty claims apiece, some of which have netted comfortable fortunes to a good many men. One claim netted in two years 70,000 dollars, or say £14,000. The owner then gave it away, and the man on whom he bestowed it is now taking a small fortune out of it. On one of the bars on Stewart river, four men took 6000 dollars (£1200) in less than a month. On the Pelly only fair wages have so far been made. Of the Teslin, we may say it is better than the Pelly, but not so good as the Stewart. In some cases, from 10 to 12 dollars, that is, from £2 to £2 10s., have been made per day on its bars, and this holds good along its entire length, if report speaks truth. On the Stewart, Pelly, and Teslin, little or no prospecting has been done off the main streams, and on all the other known rich auriferous areas, it is in the smaller streams and gulches the most wealth is found.

Now, all these indications point pretty conclusively to this fact: Canada has, exclusive of the province of British Columbia, in which doubtless very much mineral wealth will be found, an area bounded on the west by the 141st meridian, on the south by the 60th parallel of latitude, and on the north and east by the summit dividing the basins of the Mackenzie and Yukon rivers, comprising upwards of 125,000 square miles, over nearly all of which we find gold in more or less abundance. This area contains approximately 7000 linear miles of river, stream, and gulch, of which we are fairly certain at least one-half is auriferous. It must be borne in mind that those miles are only *linear miles*, along which the auriferous area will not average more than 500 to 1000 feet in width. Of the half of this, or, better still, say 3000, which we can safely assume gold-bearing, only about 200 were fully tested and developed up to

August last, and at present date probably not more than 400 have been fairly well tested.

Now, while we cannot assert positively that any more Klondikes will be found, we cannot say there will not, and we can look forward with reasonable certainty to much valuable ground being found. What we know now to be rich will take several years to exhaust, and before that time, in all probability, we shall have discovered much more.

With reference to auriferous rock, a few words. There is not time now to theorize, so I will only give a few facts. The first location of gold-bearing rock in the Yukon district was made near the town



LOOKING UP CAÑON ON FORTY-MILE RIVER 8 MILES ABOVE MOUTH.

of Forty-mile, on a hill known as Cone hill. This is a veritable mountain of auriferous rock of low grade. Several tons of it have been assayed, with the result that it shows from 12s. or 15s. to 44s. per ton of rock, the average being about 24s., or nearly 7 pennyweights. Two or three claims have been located here 1500 feet long by 600 wide, the maximum legal limit for quartz claims. Soon after, two more lodes were located opposite to where Dawson now is, but they are not extensive, though said to be richer. Up the Trondik a short distance another very extensive exposure has been discovered of low grade ore, and further up still another has been discovered which assays from 100 dollars (or £20) to 1000 dollars (or £200) to the ton.

The only difficulty about this one, we do not know the extent of it; there is no development work done, and the exposure is very small, so we cannot say whether it is as good as the others, which are more extensive, though lower grade; in fact, we cannot say it is worth developing.

Still farther up the same river another claim has been located, of which it is alleged it is very extensive, and fairly good. I can give no figures. About 20 miles below Dawson two more claims have been staked on what is stated to be one of the largest lodes in the world, and assaying an average of 28s. to 32s. per ton, or 8 to 9 pennyweights.

Two or three others of less importance have been discovered and located, but, as far as I know, with the exception of the doubtful one mentioned, none very rich have yet been found. But I have no doubt that improved transport facilities and improved methods of mining low-grade rocks will yet render these important and valuable.

On Lake Bennett I have picked up specimens of gold-bearing rock that have assayed very small quantities, hardly worth mentioning, but it shows it is there. The same remark can be made of many other places, needless to mention now. Miners speak very hopefully of quartz discovery on the Stewart river. They say that the rock at the head of its waters looks very well, but they have not brought in anything to show what it is worth. Heretofore there has been no chance of developing any of this property, the freight on mining machinery would often cost two or three times the worth of the machinery itself. You have to take it from some point on the coast some 3000 miles to St. Michael's, and then some 1600 or 1700 miles or more up the river, which makes it cost from 125 to 130 dollars per ton, and heretofore the transport facilities there have been altogether inadequate to keep up the proper supply of provisions. Year after year many of the men who have gone there had to come back in order to live over the winter, owing to the dearth of provisions. As soon as the Teslin road is finished, that trouble will be wiped out. On Forty-mile river there are deposits of galena carrying silver as high as 34 ounces to the ton. A line drawn from near Dawson, down the valley of the Yukon, to within a short distance of Forty-mile, shows indications of copper all along.

From the vicinity of the boundary on the river, a high range of mountains of cretaceous limestone runs in a south-easterly direction for more than 100 miles. It is much the highest and best-defined range in that part of the country, and, as far as I have seen, in the Yukon valley. Along the westerly base of this range a deposit of very superior lignite coal is found, at some points very convenient to the river, and nowhere I have seen or heard of difficult to develop. When facilities are convenient for working the quartz before mentioned, the necessary fuel will not be far to seek.

Now I will tell you something of the timber resources of the country. Beginning at the head of Lake Bennett, you have scrub timber, pine (or

spruce), and poplar, as it is known in that country. I won't give you botanical names, as it is only wasting time. The trees are small and scrubby, generally useless for anything but firing. By long and extensive searches you may find a tree here and there suitable for making boats, such as are used on the river—that is, large enough to yield planks 6 or 8 inches wide. As you get to the foot of this lake, the timber increases in size; but the number of fair-sized trees, that is, from 8 to 12 inches diameter, is very limited. At the foot of Lake Marsh, the timber is really of service and valuable. But the only place you find it is adjacent to the river; away from the river, 100 or 200 yards, you



Meridian.

LOOKING NORTH ACROSS YUKON RIVER AT 141st MERIDIAN OR INTERNATIONAL BOUNDARY-LINE. DECEMBER, 1895.

can only find small scrubby trees that are growing on eternally frozen ground through a thick layer of moss, and the result is you will see many trees 2 or 3 inches in diameter, that are probably two or three centuries old. As you go up the hillside it gets thinner, until at an altitude of 1500 or 2000 feet above the river, you are out of the timber altogether, on the bare rock of the mountain-top. That condition holds until you get down to the Yukon flats, when the timber begins to thin and gets smaller and thinner, until you get to within 300 or 400 miles of the mouth, where there is no timber at all. It is simply shrubby, and from there the steamers have to depend on the driftwood, brought down the river annually from above. Take the best part of this timber area, and trees 15 or 18 inches in diameter are scarce, and you seldom

find one 20 inches. At the boundary, when I wanted to erect my transit I wanted a tree 22 inches, and after a three days' search by five men over a radius of 2 miles, the largest tree we found was only 18 inches in diameter at 3 feet above ground.

Now as to its agricultural value. A pamphlet was issued by the Director of the Central Experimental Farm at Ottawa not long ago, on the agricultural possibilities of the Yukon district. One of our newspapers, in a review of it, said that the director had issued a pamphlet on the agricultural possibilities of the Yukon, the most characteristic feature of which was, that the Yukon district seemed to have no agricultural possibilities at all. At one or two points attempts have been made to grow vegetables, but with limited success. Mr. Harper, who resided at Pelly since 1891, had a garden, in which he grew some very poor potatoes and other garden stuff. What succeeded best was lettuce. To protect them at night when the sky was clear and frost threatened, he lowered an immense awning over them, raising it in the morning after the plants had recovered from the effects of the cold. At Forty-mile they have several gardens in which they grow a very fair potato, but it is not dry, and not at all well tasting. They also grow good lettuce and small cabbages, which is very much relished, because it is the only vegetable supply there, and at present you cannot import any. This shows conclusively one need not count on anything in the way of agriculture as food-supply; for two reasons, the extent of available soil is very limited in comparison with the rest of the country, and it might be said frosts occur every month in the year. Close to the river, the temperature of the water from June to September runs from about 46° to 56° or 58°. Of course, the proximity of a large body of water at those temperatures considerably aids vegetable life and helps its development close to the river, because it moderates the adjacent temperatures. But away from the river a mile or so, you have serious frosts every month in the year.

The ice in the river breaks up generally about the middle of May. After breaking it runs very thickly for two or three days, when it begins to thin out and flow less and less, until at the end of a week it is clear enough for steamers, though small boats could navigate it sooner, especially if going down. There are only about three and a half months in the year during which you can go to St. Michael, for the reason that Bering sea does not open much earlier than July 1, and the river closes middle of October. In 1896 it was July 7 before the steamer could approach St. Michael. Ice freezes on the river to a thickness of 4 feet and upwards, and it takes a great deal of force to break it, and when it does break it drives for long distances in big cakes, and the river is so jammed with it that it is one of the most terrific exhibitions of force to see the Yukon river a few hours after the ice breaks. Often it stops altogether by jamming

METEOROLOGICAL RECORD IN THE YUKON DISTRICT.

Year.	Month.	TEMPERATURE.			NUMBER OF TIMES.										REMARKS.			
		Mean minimum.	Mean	Highest.	Lowest.	30° and below.	Zero and below.	-10° and below.	-20° and below.	-30° and below.	-40° and below.	-50° and below.	-60° and below.					
		°	°	°	°													
1857	Aug.	39.9			21.6	4												
"	Sept.	31.7			16.0	18												
"	Oct.	18.5			4.0	31												
"	Nov.	5.1			-2.41	30	22	12	3									
"	Dec.	-33.6	-27.6	10.5	-55.1	31	31	29	26	19	14	4						
1883	Jan.	-25.3	-15.3	13.0	-53.5	31	27	23	19	16	7	3						
"	Feb.	-16.8	-4.3	24.2	-52.7	29	24	17	11	7	6	1						
"	March	-11.5			-52.7	26	19	13	6	5	4	1						First snow on the 23rd.
"	April	-20.4			-37.7	21	28	23	13	7								First ice running in river on 21st.
"	May	19.8	43.3	55.0	-1.8	30	1											Ice set in river on the 15th.
1895	Aug.	40.1			28.0	6												
"	Sept.	30.9			21.5	13												
"	Oct.	19.4			-12.7	23	1	1										
"	Nov.	4.2	11.9	38.5	-36.3	30	12	3										No readings were taken on 3rd, 4th, 6th, 7th, and 8th.
"	Dec.	-18.2	-13.8	6.0	-55.4	31	29	20	10	6	3	1						11th.
1896	Jan.	-41.9	-33.0	6.0	-67.9	31	31	29	25	24	15	12						
"	Feb.	-25.5	-11.6	32.0	-37.3	31	20	6	3	1								
"	March	-2.4	18.1	39.5	-28.4	28	15	10	8									
"	April	2.0	24.0	49.0	-5.0	18												
"	May	28.8	48.7	80.0	27.8	4												
"	June	39.8	65.1	80.0	35.0													
"	July	44.5	68.9	81.0	35.0													
"	Aug.	42.1	62.6	76.0	27.2	2												
"	Sept.	34.3	50.5	63.0	4.8	8												
"	Oct.	20.2	32.9	51.0	-1.0	27	2	18	13	7								
"	Nov.	-14.7	-6.0	22.5	-3.0	30	23	18	11	7	2							
"	Dec.	-17.4	-6.5	11.0	-3.1	31	28	1	11	7	9							
1897	Jan.	-24.0	-14.0	10.0	-55.0	31	27	21	16	13	9	6						
"	Feb.	-12.3	0.6	31.0	-36.0	28	23	14		2								
"	March	-14.7			-54.3	30	21	15	1	8	5	3						
"	April	18.1			-5.0	27	1											

No readings were taken for max. temp. on 6th, 7th, 8th.  
 No readings were taken for max. temp. upon 16 days. " " on the 28th.  
 " " " " 4th and 5th.



in some sharp bend; the waters are dammed, rise, and when sufficient height is attained it breaks away again, leaving vast piles of ice along the banks, which are not melted away for more than a month. The upper part of the river opens sooner than the lower, but generally it may be said the whole river is open to navigation about June 1. Ice begins to form again in the river about the middle of October, and continues to accumulate until about the first quarter of November, when it sets, and the river is covered with ice—not smooth as we see it in more southerly latitudes, but rough and broken to such a degree that travel over it is in most parts impossible until the winter storms have drifted the snow into the spaces between the blocks of broken ice. Then travel is possible, but often very tedious and laborious. Each of the three winters I spent in the country accumulated about the same amount of snowfall, averaging nearly 3 feet. It is needless to say no melting occurs between October and April, with the exception of a very little in March in well-sheltered spots facing the south, but, as this is only local, it does not affect the general mass in any appreciable way. The snowfall is pretty evenly distributed over the seven months, October to April inclusive; but, as far as my observations go for three years, there is a predominance in October, November, and February. June, July, and September appear to be the wettest months. June, July, August, and part of September are the growing months. The subjoined synopsis of my meteorological records will give an idea of the prevailing temperatures.

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Before the lecture, the PRESIDENT said: The distinguished member of a topographical survey of Canada, who is with us this evening, has not now been heard of by this Society for the first time. You have known of his work for the last ten years, and I think it was in the year 1891 that the Council awarded him the Murchison Grant for his distinguished energy and ability in conducting the survey of the region which he is about to describe to us—the basins of the Mackenzie and of the Yukon. But this is the first time we have had the pleasure of welcoming him amongst us, and I feel sure that he will be cordially received by this meeting. I will now ask Mr. Ogilvie to deliver his address to you.

After the lecture, the PRESIDENT said: Does any one in the meeting wish to address us or ask any questions? If not, I will remark that this region of the Yukon and the Lower Mackenzie was almost entirely unknown before Mr. Ogilvie was sent there to survey it in 1887. I believe there were two Hudson Bay forts established there in about 1846, but they were afterwards abandoned, so that when Mr. Ogilvie began his examination of this country we may look upon it as having been practically entirely unknown. He has surveyed it, and several years ago gave us an interesting account of it. The greatest calamity that can happen to a country is a war. The next greatest calamity, in my opinion, to an inhabited country is the discovery of gold. But we must confess here that both the operations of war and the discovery of gold have always been a great advantage to geographical science. It has been so in the present instance. I doubt whether, if Klondike had not become so famous, we should have had the great advantage of the presence of Mr. Ogilvie with all his numerous photographs this evening, and I

also doubt very much whether he would have had so large an audience. We have, I think, a great deal to thank him for. He has described to us the physical characteristics of the country in the most graphic way. He has shown us what its capabilities are as regards its minerals, and what its incapacities are as regards its vegetable productions. It appears, from what he has read to us about the temperatures, that this country is about the coldest in the world; for a registration of  $-67.9^{\circ}$  is very rare. I myself served in the arctic regions, and we never registered lower than  $-50^{\circ}$ . I believe the lowest ever registered was in Siberia, and this was lower than  $-68\frac{1}{2}^{\circ}$ . Still, thermometers are liable to error, and I suspect you have found in the Klondike district about the coldest region in the world. Mr. Ogilvie has illustrated his address by a most interesting series of views which have given us an admirable idea of the country he has described. Both for what he has told us, and for his remarkably interesting illustrations, I beg you to pass a very cordial vote of thanks to Mr. Ogilvie.

Mr. OGILVIE: I just wish to return my acknowledgment for your vote of thanks. I rather thought myself that I was a little dry on the subject. I have been troubled with a sore throat since I came to London, and it has bothered me a great deal this evening. I thank you for your attention and the patience you exhibited. I hope at some future date I shall be able to talk under better advantages, and show you other and perhaps better pictures—I won't say that, but just as good.

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