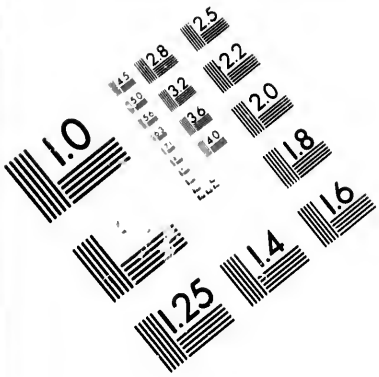

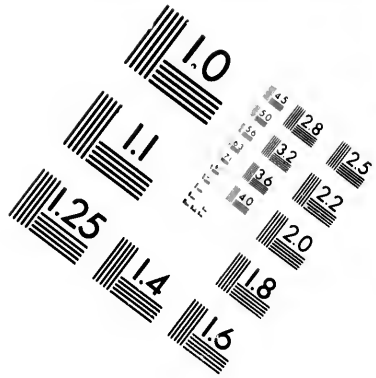

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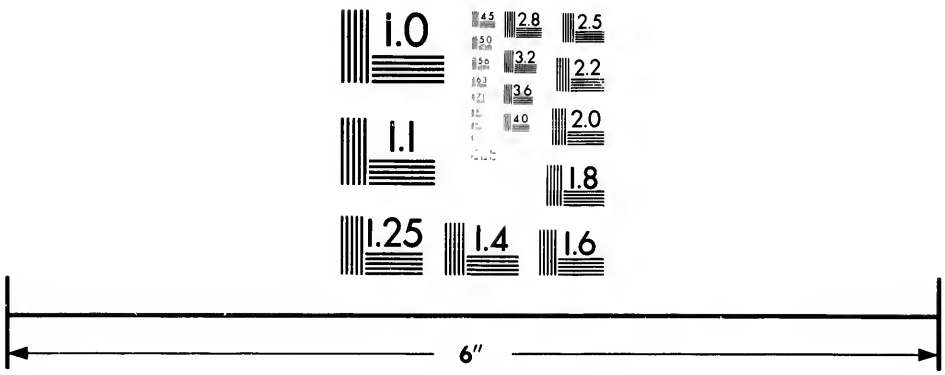

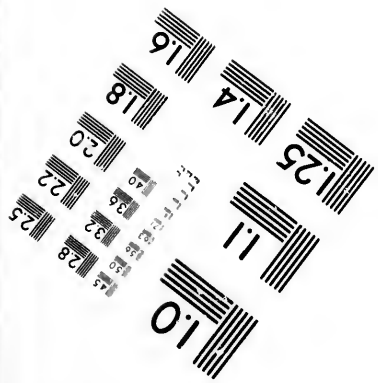

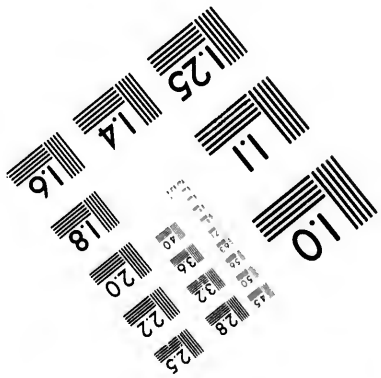

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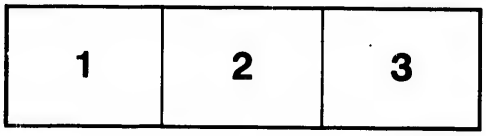

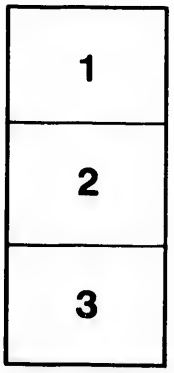

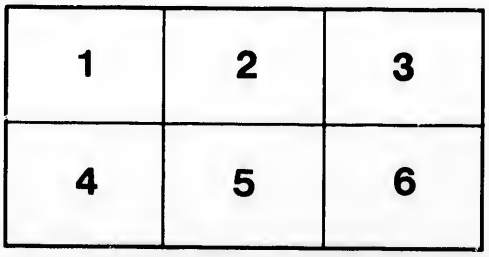

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IN NORTH-WESTERN WILDS.

The Narrative of a 2,500 Mile Journey of Exploration in the great Mackenzie River basin.

BY WILLIAM OGILVIE, D.L.S., F.R.G.S.

I.

By the terms of Union with the Dominion, British Columbia, in May, 1871, conveyed to Canada, in trust, a belt of land, not to exceed twenty miles, on each side of the projected Canadian Pacific Railway line. It was found that much of the land in such a belt had already been conveyed by the Province to settlers and others, and to compensate for this, 3,500,000 acres in the northern corner of this Province, adjacent to Peace River, was granted to the Dominion.

Some material changes in this arrangement were proposed by the Government of British Columbia; in view of which, and to gather some information required for the proper selection of the 3,500,000 acres in question, the Dominion Government determined to make an examination of this part of the Province lying between the Liard and Peace Rivers.

To make this examination, the writer was selected, and received his instructions therefor on the 5th of June, 1891. A special canoe had to be made for the purpose, and shipped to Calgary by the Canadian Pacific Railway. This delayed his departure from Ottawa until the night of the 30th of June, or the morning of the 1st of July.

As the thriving little town of Edmonton has now, and had very nearly then, railway connection with the rest of the world, I will begin with it the account of the journey.

The name of this place recalls a ridiculous item copied by an Ottawa paper some weeks ago, from, if I recollect aright, a Minneapolis paper, giving an account of the travels of three men who had left that city to hunt buffalo in the so-called frozen north. These men had not been heard of for some time, and the paper proceeded to give a sensational account of their presumed wanderings, picturing them as Arctic travellers, and wound up by the expression—"*When last heard from they were at Edmonton.*" Altogether, the item sought to convey the impression that these men were attempting something almost unprecedented for hardship and cold. Now, I can safely venture the assertion that any ordinary civilized being could spend his life about as happily and comfortably in Edmonton as in Minneapolis—any way, as much so as in any town of the same size in the State of Minnesota. Edmonton is a town of several hundred inhabitants, and four or five churches, good schools, two lines of telegraph connecting it with both the east and west, several doctors, lawyers, and surveyors, and members of other professions. With several grist and saw mills, numerous stores and hotels, and lighted by electricity; with a large coal mine just outside the limits, and railway communication putting it within *three days* of *Minneapolis*, it was not a bad place in which to be "last heard from."

Edmonton is, to use a stereotyped phrase, "beautifully situated" on the north bank of the North Saskatchewan River; though, since the railway reached it, in 1891, quite a town has started on the south bank. The river here is about 300 yards wide, and, except at very low water, permits the ascent of the ordinary flat-bottomed stern-wheeled steamers, such as navigate the Missouri and other

rivers in the western United States.

Before the days of the C.P.R, several fine steamers of this kind plied in this river from its mouth to Edmonton. They could go farther up if necessary.

The ascent of upwards of a thousand miles, against a current of four to six miles an hour, put competition with about a thousand miles of railway out of the field, more especially as the navigability of the river was uncertain, owing to the irregular and great fluctuations in the depth of the water.

Just here I will warn the reader that he is not to be regaled with uncanny tales of adventure, still less with grandiloquent accounts of heroism. He will simply get as plain a history of the journey as I can place before him.

EDMONTON, 1890.

First, then, as to the *personnel* of the party. With myself the readers of this magazine are more or less familiar, as they are also with Gladman, who accompanied me on this journey, as he did on my journey down the Yukon and up the Mackenzie. Let me introduce the other member of the party as "The Professor," for as such he is known wherever he has lived, and certainly if originality of character can give a man a claim to the title, then he is a Professor among ten thousand. The Professor, by the way, was our *chef de cuisine*, but, in addition to his duties as such, he took much delight in instructing Gladman and myself in the due performance of our duties, from cutting a stick of firewood to the reduction of a lunar distance. All this gave him such infinite satisfaction, that I very seldom interfered with him, and, even if I had, he was invulnerable to reproach or persuasion. His various dissertations on geology, cosmogony, botany, astronomy, and ethnology during the time we were together would immortalize me, could I repeat them here. They certainly were original, but that they were logical is open to dispute in his case as well as in the case of every other celebrity. He always had a theory to account for anything and everything we saw or heard of, and the theories were just as satisfactory to himself as if the wisest and most learned man in the world had propounded them.

NOTE.—Several of the views given in this article are by Count de Sainville, and are loaned by His Honor, Lieut. Governor Schultz of Manitoba.

On the morning of the 10th of July we left Edmonton with one canoe, the *Nelson*, fixed on top of a waggon-box, and part of our supplies for the trip in the box beneath; the remainder of them were in a cart. We had a team and buckboard.

The distance between Edmonton and "Athabasca Landing," on the Athbasca River, is, by the road, about 95 miles. In an air line it would be about 82 miles. The first forty miles from Edmonton passes through good country, it being prairie and woods mixed. The soil is good everywhere, and much of the timber is fair, but there is not enough of it of marketable quality to justify thought of export, although, no doubt, it will yet be in demand in the more open country to the south and east. The surface here is undulating, sometimes rising into high knolls and ridges.

At the end of this distance, the conditions change; the prairie merges into the great northern forest that stretches to the Arctic Ocean, but the forest fires have in recent years destroyed much of the wood. In 1883 and 1884, when I first passed over this road, for more than fifty miles south from Athabasca Landing there was a continuous forest, with much fine spruce timber in it. In 1891 much of the best of it had been destroyed. As there are only two or three settlers in the northern half of the distance, it is impossible to prevent the spread of fires when they are once started.

The supplies for all the Missions and the Hudson's Bay Company's posts in the vast Mackenzie River basin pass over this route in carts, waggons and sleighs. Besides this, all the hunters and traders going north go this way, so that several hundred tons are yearly carried over it. The Hudson's Bay Company had to cut the road out wherever necessary, and bridge or ferry all the streams, and I believe they have had to bear the brunt of keeping it in repair ever since it was first used. Whenever the pushing of our railway system past Edmonton to the Landing is needed, no serious difficulty in construction will be met. About midway of the distance, some knolly country will be passed over, but I think no more difficulty will be found here than in some parts of the prairie. The descent to the river level near the Landing—some 300 feet—will be easily made down the valley of the Tawatana.

This stream rises near the height of land between the Athabasca and Saskatchewan River systems. The name Tawatana is Indian for "the river between two hills." It got this name from the Indians, because one coming down the Athabasca River sees the points formed by the intersections of its valley with that of the Athabasca valley, projected against the sky, and they appear like two high knolls, though in reality they are not knoll-shaped.

We reached Athabasca Landing on the morning of the 13th, just in time to see the steamer *Athabasca* take her departure.

The day was spent arranging matters for our early departure next morning, and, as there was little probability of our being able to send any letters out until our return here, we all wrote several letters to friends at home. In the evening Gladman and I launched our good canoe and had a trial spin on the river. We encountered an Indian family going up the river in a great, ugly hulk of a "dug-out," made out of a very large balsam-poplar tree; and we amused them highly by paddling around them in a circle and still ascending the river as fast as they. Of course, our canoe was very light and theirs was very heavy, but they had half a dozen paddles to our two.

The river here is about 300 yards wide, with a sweeping current, and at mean height has an ample depth of water for the steamer *Athabasca*. This steamer was built here by the Hudson's Bay Company, in 1887. She is

a stern-wheeled, flat-bottomed boat, capable of carrying 150 tons, and with this load will draw about three feet. It was originally intended that she should ascend as far as the mouth of the Lesser Slave River and go up it to Lesser Slave Lake, thence along the lake about 65 miles to the Company's post at the west end, but so far she has not succeeded in doing this. The lower part of Lesser Slave River is generally shallow and rapid. Some people say there are 19 rapids, some say 21, but, though I have been over the river three times in summer and once in winter, I have been and still am under the impression that there is only *one*. However, there is no use in arguing over trifles: suffice it to say, the steamer has not yet been able to pass this one or those many rapids. She has got so far as to have the end of the last in sight, but, after many days' trying to get over, and after waiting for a rise in the water, she had literally to turn round and *walk* back.

For many years past the Company took all its goods for the Peace River district in by this route. They were brought from Edmonton, or Fort Edmonton, as it was originally called, in carts! Then they were stored in a small building erected by the Company for the purpose. York boats took them from the storehouse up the Athabasca and Lesser Slave Rivers to Lesser Slave Lake, and over it to Lesser Slave Lake post, where they were landed and taken by ox-trains 86 miles overland to Peace River Crossing, and thence commonly overland by carts, to Fort Dunvegan, and some down to Vermillion in scows.

York boats are usually constructed to carry about six tons. The keel is 25 to 28 feet long, bow and stern are made alike in shape, and the end posts are given great sheer, to offer as little resistance as possible to strong currents. These boats are generally about 40 feet over all; the width is from 9 to 11 feet. They are commonly manned by a crew of ten men The steersman's duty is obvious. The bowsman's is to stand on the bow with a pole and sound as it goes along—for in the swift, turbid water, bottom cannot be seen—to help to get the boat around sharp points, fallen trees, and other obstructions. and see that the hauling line does not get fouled on the bottom or along the bank. The remaining eight, man the hauling line by turns, four at a time, taking "spells," as they are termed, of half an hour or more. As soon as the pilot calls time, the half on the boat jump overboard, it may be up to their necks in water, scramble ashore, run to the end of the line, seize it and start, while those relieved get into the boat as best they can. In this way the boat is kept on the move from 15 to 18 hours a day, and so difficult is the progress that, on this route, the general rate of travel is a little over a mile an hour. The line used to haul with is not much, if any, thicker than an ordinary penholder, and is hard spun and strong. Its chief requisites are lightness and strength, for usually there is about 100 feet of it out—often more—and a heavy line of that length would in slack water and eddies give great trouble to keep it taut, which, if it is not, would cause great delay by allowing the line to be caught in brush, logs, or rocks in the river. A great deal of the work formerly done by these boats is now done by steamers, but there are some parts of the river where steamers cannot run, and the old style of navigation described still has to be kept up.

Early in the morning of the 14th we loaded our outfit (in all about 1400 pounds) on our canoe, and with Gladman in the bow, the Professor in the middle, and myself in the stern, we started on what we expected to be a 2,500 mile voyage in that canoe.

The Professor was jubilant and looked forward to immortalizing himself, as he fully intended writing a glorious account of his wanderings and heroism

for the Edmonton *Bulletin*. He was full of discovery and speculation, and amused us by his droll fancies and droller way of expressing them. His vocabulary was not limited to Webster or Worcester, and his pronunciation was not confined by orthoepy A peculiarity of his speech, which would attract attention anywhere, was the prolongation of vowel sounds. Being full of geographical knowledge and the annals of discovery, he could not refrain from talking about them.

Once he addressed me as follows:

"Say, Mr. Ogilvie; do you think they'll discover any continents or great islands in the world yet?"

"No, Professor, I don't think so; in fact, I am sure we won't. The world has been travelled over enough now to assure us there is nothing extensive to be discovered."

"Wall, that's what I say, but I had an argument with a fellow not long ago, an' he said they'd discover continents yet."

"What did you say to him?"

"Wall, I said, for a man of his knowledge and education, I thought it was a *heterogonus* kind of an idea."

"A what?"

"A heterogonus idea."

"What's that?"

"Don't you know?"

"No, what is it?"

"Never heard the word before?"

"No, what does it mean?"

"Never saw it in the dictionary?"

"Not to my knowledge. How do you spell it?"

"Wall, I don't remember, but it's there."

"Well, what does it signify?"

"Come now—honor bright—boss, you know what it means?"

"I tell you *no*. I never heard the word before, and don't think I ever saw it. What do you mean by it?"

"Wall it means, ah-ah kin' of-ah, —oh, come now,—honest— you know what it means."

"No, I don't, I tell you. Can't you believe what I say?"

"Why, that's curious. Wall, it means—ah—ah— wall, it means—a kin' of a d——d fool idea like."

"Yes, I guess it does;"

"Don't you think I hit him right?"

"Certainly you did; couldn't do it better."

Were I to commit all the Professor's queer remarks to paper, they would fill a large volume, and all just as original as the one given. He knew all science, but theology was his favorite subject, and he several times averred that there were many souls in Meeker County, Minnesota, who daily thanked the Lord for his ministrations there in his early days. Nothing escaped his attention, and everything was described and explained, sometimes to his and our satisfaction, but often to his satisfaction and our annoyance or mere amusement. He certainly never let us weary thinking.

Early in the afternoon we passed some families of Indians camped on the bank. Now, Indians expect all passers to call, and at least treat them to a smoke; but, as we were in a hurry, I was not inclined to stop at all. They hailed us with the usual salute; "Ho, bo joo" (*bon jour*). I fired back at them some phrases in the Chinook jargon which they never heard before. It so dumbfounded them to hear white men speaking in such a strange tongue, that without a word they meekly watched us drifting by.

The Professor too, was amazed. He professed to know something of every language under the sun except this, and he vainly besought me to tell him what it was and translate for him. I felt so elated at knowing something he did not know, that I would give him no satisfaction, and Gladman, who knew what I said, was equally heartless; whereat the Professor vowed in wrath that he would "learn that yet, if it cost a farm."

I would simply weary the reader were I to only attempt to relate the many original and ridiculous discussions we had on our way. The reader

GRAND RAPIDS, ATHABASCA RIVER, FROM POINT ON EAST BEACH, BELOW ISLAND.

may think me very foolish for indulging in such farcical discussions; perhaps I was, but our lonely position and the strong temptation to which we were exposed must be remembered.

I will give now some notes on the Athabasca River.

From Athabasca Landing down stream the river is free of hindrance to navigation for about 120 miles, when we reach Pelican Rapids. These are not difficult to navigate; the only trouble in them arises from low water and some rocks in the channel. When the water is high there is no danger at all, as the steamer can easily ascend under a good head of steam. It appears they take their name from the presence of pelican in or about them nearly all summer. Both times I went down the river I saw some there. A fair-sized canoe can be run down these rapids with safety.

One hundred and sixty-five miles below the Landing, Grand Rapids are reached. This is the rapid of the river, and partakes more of the nature of a cataract than of a rapid. In the middle of the channel there is an island, over which the Hudson's Bay Company have constructed a tramway on which to transport the outfits for all the northern posts. The steamboat landing is about one and a half miles above the island, and the intervening water is very shallow, with many rocks and a very rapid current. Through this the company has made a channel by removing rocks. Between this steamboat landing and Fort McMurray the company does all its transport with large boats, locally known as sturgeon-nosed or sturgeon boats, from the fact that both bow and stern are spoon-shaped and somewhat resemble a sturgeon's nose. These boats are capable of floating about ten tons, and are each manned with a crew of ten or twelve men, and when loaded draw upwards of two feet of water. The time of their ascent and descent varies much with the height of the water, as in some of the rapids more or less portaging has to be done, which varies with the depth of water. Below the island in Grand Rapids there are nearly two miles of rough water, which in low water requires much care in navigating to avoid rocks and shallows.

Grand Rapids are about two miles

long, and I estimate a fall of about sixty-five feet for them, most of which occurs in about 2,000 feet. The river here has, through past ages, worn for itself a bed in the soft sandstone, about three hundred feet deep. Thickly scattered over the face of the rapid may be seen spheroidal, concretionary masses of sandstone, varying in size from a foot or two to 10 or 12 feet in diameter. These, harder than the surrounding mass, have offered greater resistance to the action of the water, and have remained standing on the slope of the rapid in incalculable numbers, adding greatly to its roughness. Midway in the rapid is a large timbered island, around which the waters sweep, and, converging below, rush through a channel not more than 100 yards wide, while above the island the river is from 500 to 600 yards in width. The rush of water through this channel is tremendous, and reminds one forcibly of the rapids below Niagara Falls. Standing on the east bank of the river, just at the narrowest part of the channel, and looking up at the wildly-tumbling white waters dashing from rock to rock as they sweep around the fir-clad island, while on either hand stand the towering and almost perpendicular sandstone cliffs with their fringe of dark green fir apparently brushing the clouds, one sees a spectacle that inspires with awe and wonder, and one that an artist would love to look upon and feel to be worthy of the best touches of his brush.

The greater volume of water flows down on the west side of the island. The channel on the east side is generally shallow. The descent in it is less abrupt than on the west side. At certain stages of water the channel on the east side can be run down in a good canoe or small boat, if the voyager does not mind running the risk of getting his "stuff" wet.

In 1884, I passed my stuff down the east channel in a boat manned by two men, and managed by a line held by three men on shore. One of the party ran most of the way down in a heavy dug-out canoe. On my last visit I was told of a man running down the east channel in a very small bark canoe. It was a risky thing to do, and had he been drowned we would say "served him right."

We reached the rapids at noon on the 16th. Here we found the steamer tied up at the landing-place, discharging cargo, and waiting for the boats from McMurray. As the captain told me he was going down to the island in the morning, and he would put my canoe and outfit over the tramway if I would wait, I decided to remain. On board I found my old friend Jimmy Flett, whom my readers may recollect had the great dance with Mother Cowly at Fort Chipewyan. We had a pleasant chat together, and Jimmy gave me an account of all that happened in his horizon since I saw him nearly three years before. In honor of my visit, some of the steamer's crew crossed to the west side of the river, and painted my name in huge white letters on the sandstone cliff. A lob-stick was also made to commemorate the event. A lob-stick is formed by cutting all the branches of a good-sized tree, except a few near the top. The tree, after the operation, presents a docked appearance, and many such trees can be distinguished at a long distance. Originally and generally, these lob-sticks were made to commemorate the meeting or parting of friends and parties, but some times they were made in recognition of the gift of a pound of tobacco, or a little tea. To many of the old inhabitants, they are historical land-marks, and with them in actual or in mental view they could give a fair history of the district.

In the evening, part of the forward deck was cleared, Jimmy brought out his fiddle, and the Red River jig was indulged in. I have sometimes thought that Burns must have witnessed some such dance as this before he wrote the immortal "Tam O'Shanter." Cer-

tainly the witches could not have put any more vigorous effort into their dancing than do the patrons of this jig, even if

"They reeled, they set, they crossed, they cleekit,
Till ilka carline swat and reekit."

The Nannie on this occasion was "Schott," the pilot of the boat, a big half-breed. He is the fastest dancer I ever saw. Jimmy was put to it to play as fast as Schott could dance, and I am not sure but that at the finish Jimmy was half a bar behind. However, they divided between them the admiration of all on board, and as it was dark we could not tell which was in the greater state of collapse.

Early in the morning, Schott and part of the steamer's crew, dropped down to this island in a small boat. We followed in our canoe. After some delay a tram-car was procured, our outfit and canoe were run to the other end of the island, and from there we re-embarked. The run over the rough water below the rapids was safely made, and in about two and a half hours we were down to the natural gas well on the left bank of the river. This well is about seventeen miles below Grand Rapids, and is situated in a sharp bend of the river. The gas bubbles up all over the bay in the bend, but the principal outflow is through a rift in the bank, close to the water's edge—so close, in fact, that at high water it is covered. The crews of the boats often use it to boil their kettles, and, when once lighted, it burns until a strong gust of wind puts it out, or the water overflows it.

LOWERING A SCOW OVER THE CASCADE RAPIDS, ATHABASCA RIVER.

Could all the gas flow be gathered into one outflow, it would make a large volume. Incautiously, I applied a lighted match to the rift, and paid the penalty of having my face scorched, though not seriously. The flame fluctuated much in volume, dancing up and down from two to five feet in height. The gas burns with a pale, bluish flame, so far as I could judge, of much heat, but little illuminating power. The Professor had many theories to account for this gas flow, but as he settled on none of them as satisfactory, in justice to him I refrain from giving any of his speculations.

Shortly after passing this, we met

the fleet of sturgeon-nosed boats on its way up to Grand Rapids for the "stuff" brought down by the steamer. It was several days overdue, and we learned that the cause of the delay was an epidemic of *la grippe*, which seized on the majority of the crews at the same time, and rendered the boats so short-handed that they had to tie up for some days, and a messenger was sent back to McMurray for help. Two of the boats were left at the next rapids until the crews left with them, consisting of all the sickest men, should recover sufficiently to come on. Many of those we met were not feeling fit for work, and some of them were prostrate in the boats.

This was the first time that the malady had visited this part of the country, and these simple, superstitious people looked on it with much concern. Strange to say, it kept ahead of us all the way to Simpson, arriving one or two days before we did at every post. I was glad of this, for, had we preceded it, on us would have been laid all the responsibility of bringing it in; even as it was, some of the natives thought we sent it ahead of us.

Most of the natives are very suspicious. They cannot understand what strangers, who are not traders or missionaries, want in their country, and they attribute ill-luck of any kind to the baleful influence of the stranger.

Between Grand Rapids and Fort McMurray there are ten rapids. I obtained from the pilot of the steamboat (a man who was acknowledged by all I inquired of, to possess as complete and reliable knowledge of the river from the Landing to Lake Athabasca as any man in the country), the names of these rapids, and the best way to run down them.

The first in the order of descent is named "Brulé Rapids." It is about 25 miles below Grand Rapids. In it the river spreads out from 250 or 300 yards in width to upwards of 400. In mid-stream the water is shallow, so much so that large trees strand on the way down. The channel is on the left side of the river, and quite close to the shore. It is not more than one-fourth of a mile long, and by keeping not more than twenty or thirty yards from shore, there is no danger in its descent. It appears the rapid takes it name from the presence of an extensive brulé. About sixteen miles below it comes "Boiler Rapids." This is quite an extensive rapid, though only the lower part of it is very rough. In high water the left side affords the safest channel to run in, and in low water the right side. It takes its name from the fact that the boiler intended for the Hudson Bay Company's steamer on the lower river was lost in the rapid, through the wrecking of the scow which contained it, on its way through in 1882. At the foot of this rapid there is much rough water, which requires a good-sized canoe for its safe descent.

In sight of the lower end of the last comes "Drowned Rapids." The channel here is on the left side, quite close to the shore, and were it not for three or four large swells caused by rocks, it might be run down by anyone, without any apprehension of danger. It takes its name from the fact that a man named Thompson was drowned some years ago by the swamping of his canoe in running through it. I had the misfortune, in 1884, to lose a member of my party in a similar manner, though I have gone through it myself twice, and ran no risk that I was aware of. Less than a mile from this rapid we enter "Middle Rapid." This is not very rough, but is somewhat shallow and stony. The channel in this is on the right side.

The next rapid is known as "Long Rapid," and the channel here is also on the right side. The water in it is not very rough.

Next in succession is "Crooked Rapid," so-called from the fact that in it the river makes a very short turn

round a limestone point. The channel is on the right side, and is not rough, with the exception of a small "chute" just at the head; this requires care in a canoe.

"Stony Rapids" come next. In them the channel is on the right side, and is not very rough.

The next is appropriately known as the "Cascade," the river falling over a ledge of rock about three feet high. The channel is on the left side, and certain stages of water permit fair-sized canoes to descend it without much risk.

The last rapid worthy of note is known as "Mountain Rapid," by reason of the high banks in its vicinity. It is rather rough, but there is a good channel, which at the head is on the left side, and in the middle there is a piece of smooth water, through which a crossing is made to the right side, which is quite smooth, while the left side is very rough.

The last of the series is known as "Moberly Rapid." It is only a ripple caused by some rocks on the left side of the river, in the midst of a swift current. On the right side, the water is smooth enough for the passage of the smallest craft. From the head of Grand Rapids to Fort McMurray is upwards of 85 miles of river altogether too bad for the present steamer to ascend. It is the opinion of some, that with proper appliances the present steamer might succeed in doing so, but it appears to me that such a project would involve much expensive labor and considerable risk.

The first outcrop of petroliferous sand is just at the head of Boiler Rapids, and from here it is found anywhere along the river for a distance of 150 miles. *In situ* it presents a stratified appearance, and looks like a dark grayish rock, but when exposed to heat for a few minutes, it becomes viscid; hence on hot summer days the cliffs exhibit long streams of the sand and tar crawling down their slopes. As the cliffs become weathered, the mixture rolls to the bottom, in many places forming a beach of tar-sand along the river. When this is exposed to the sun on hot days, if one stands for some time on it, he will find himself slowly sinking into it.

The tar sand is several hundred

GRAND RAPIDS, ATHABASCA RIVER, FROM THE FOOT OF THE ISLAND.

feet in depth, and overlies a Devonian limestone, the first extensive exposure of which is seen at Crooked Rapids, and continues as exposed at every point and rapid until we get some forty miles below McMurray.

Mr. G. C. Hoffman, Chemist of the Canadian Geological Survey, reports that "the tar or maltha, as at present found on the surface throughout a large district on the lower Athabasca, could be utilized for a bituminous concrete for the paving of roads, courtyards, basements, and warehouses, and for roofing. The tar is found combined with fine, colorless siliceous sand, which constitutes 81.73 per cent. of the mixture.

At one or two points along the river the tar collects in hollows which are called tar springs, but there is nothing subterraneous about these springs. They are due to the action of gravity, the tar oozing down the surrounding slopes into a basin and accumulating there.

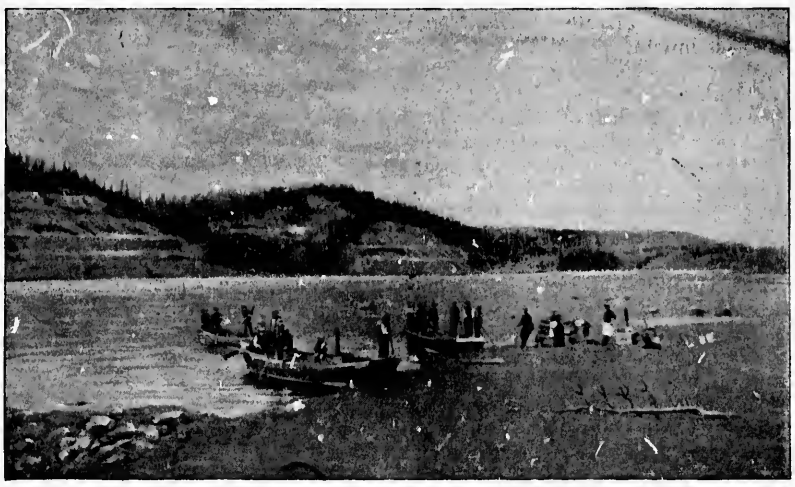
The tar from these springs was formerly used to pitch the outsides of the boats used on the river. For this purpose it was cooked as in the case of ordinary boat pitch. On hot days the odor from these tar sands is very similar to what we notice when walking through a railway yard when the sun has heated the oil-smeared ties.

The Professor was amazed at the enormous exposures of this sand, and racked his brain in vain to account for its existence. He was not sure but that it was due to the glacial period. Generally, he believed, we owe most of the North-West to that time.

From Athabasca Landing to McMurray the river banks are never less than 300 feet high; in the rapids they are sometimes 500. They are often bold and bluff, forming picturesque scenes. At McMurray there is a marked change in the surface features; the banks are seldom more than 30 or 40 feet high, and the river valley slopes easily back to the general level of the country. At many points along the lower river extensive and beautiful views are seen from some of the river reaches.

All the surrounding country is timbered with spruce and poplar, much of which is merchantable, but unfortunately the river system flows away from the settled parts of the country, and as we have homes for millions on the prairies and semi-prairies south of this, which will take decades to even partially occupy, this timber is practically a sealed treasure to us now. On some of the upland swamps, tamarac and white birch of small size are found, but they will never figure in the country's assets.

We arrived at McMurray in the afternoon of Sunday, the 19th of July, and spent the remainder of the day there. At this point the sturgeon-nosed boats discharge their cargo, whence it is taken down to Chipewyan by the steamer *Grahame*, a sister boat to the *Athabasca*, but not quite so long. The *Grahame* was built at Chipewyan in 1882-3. Though not a large boat, it is hard for a resident of the civilized parts of Canada to realize the immensity of the task of building her. Every inch of timber used in her construction had to be shaped by hand with axe or saw. Every ounce of iron and machinery used in connection with her had to be hauled hundreds of miles in carts and waggons, then taken down the Athabasca river 430 miles to Chipewyan, and past several of the rapids in the river some of it had to be carried on men's backs. Notwithstanding this, and the fact that only wood native to the country she was built in was used in her, she presents a good appearance, and though now running ten years, is a fair boat, and with some patching is good for several years yet. This steamer also runs from Chipewyan down Great Slave or Peace River to Smith's Landing, the head of the rapids in that stream. She also runs up Peace River proper to the falls—



A CROSSING ON THE ATHABASCA.

250 miles—with the supplies for Fort Vermillion on that river.

The only hindrance to easy navigation this steamer finds between Chipewyan and the falls is the Little Rapids. This is about one hundred miles from Chipewyan, is 3¼ miles long, and really is not a rapid at all. The river in its lower reaches varies from one-half to three-quarters of a mile in width, but here it widens to a mile and a quarter or more. The incline of the river bed is somewhat steeper than the average, and the current is stronger, but there is nothing to prevent its descent in the smallest canoe. It is said that there is a pretty deep channel near the middle, but it is crooked and fringed with rocks which constitute the only danger. Even as it is, I never heard of the *Grahame* touching anything but the bank in this magnificent river, though she yearly makes one or two trips to the falls. It will be found that a good channel for much larger boats than the *Grahame* can easily be made through this rapid whenever it is necessary to do so.

The falls are a perpendicular drop of 9½ feet, and have a width of a mile. Above them is a rapid about a third of a mile in length, and a fall of about eight feet. These falls are not a very impressive sight, as the banks are low, the timber scrubby, and, on account of the width, the water is smooth. About a mile and a half above the falls is another rapid which, in time past, has been a cascade; but the water has worn channels through the rock over which it fell, leaving large masses of rock standing in the bed of the river. The fall in this rapid is about eight feet and is not more than 300 yards long. This makes a total fall from the foot of the falls to the head of this rapid of about twenty-five feet. Mr. McKenzie, at Red River post, near the falls, told me that there is a natural channel on the north side of the river, from a point a little below the falls to a point above the upper rapid, which could easily be converted into a canal. Through it the waters of an extensive swamp enter the river, and the only rock-cutting on it would be at the upper end to connect with the river. This opinion is only given from ordinary observation, and might be modified by actual survey. I did not see the place referred to, but think Mr. Mackenzie's judgment can be re-

lied on. The falls and rapids do not cause much trouble to the passage of the empty York boats or scows, for on the south side of the falls the waters have worn the rock away, so that instead of one perpendicular drop there are three or four of a foot or two each, forming a channel some 60 or 80 feet wide, down which the boats run quite easily, their impetus being restrained with ropes from the shore. A natural wharf is found at the foot of the falls for loading and unloading boats.

Once above the falls, the *Grahame*, or a larger boat, would in ordinary stages of water find no difficulty in ascending to the Rocky Mountains, about 640 miles. In very low water there are three places where she might, with a heavy load, touch bottom, but she would not be completely stopped. Two of these shallows are near the mouth of Smoky River, where the Peace spreads out over gravel flats. The other is near the boundary line of British Columbia.

Early on Monday morning we took our departure from McMurray. It was a beautiful day, delightfully clear and breezy. The river here runs in long, straight reaches, which were ever opening some new scene of beauty. Now it would be a far away vista of dark-green spruce, set in a field of emerald poplars, whose snowy white trunks reflected the sunbeams in showers of beauty; again, a dark ridge sharply outlined against the azure sky, with its dusky sides dotted with the yellow foliage of the northern birch, and all bathed in that indescribable crystal atmosphere one seldom sees in our smoke-laden, vapor-saturated air. All day we felt the impress of this scene, and were hushed in silent admiration.

By sundown we had put seventy good miles between us and McMurray, and were looking forward to making one of the quickest trips to Chipewyan on record—but record in that region is traditional. Alas! we were doomed to disappointment, for on the morrow rude Boreas was up betimes, and angrily forbade further trespass on his territory. We impertinently disregarded his command, and started to make further invasion in his domain. He, however, was not to be contemned with impunity, so rose up in his might and smote us, so that a four-mile-an-hour current and three lusty paddlers could make no progress against him. He raised the water into respectable billows, which covered us with spray, and ignominiously we had to retreat to the shore, and—before we could get comfortably fixed—to punish us for our temerity, he deluged us with a cold rain, which kept us under canvas, shivering all the rest of the day. To appease him we fasted until morning—that is, we ate nothing warm, for fire was out of the question. Next morning he relented somewhat, but kept a tight hand on us, and we could make only four miles in an hour and a half: so we landed on a point where some Indian huts were erected, and a few potatoes had been planted. The Indians were absent. We made a thorough exploration of the place. The Professor found several varieties of *Corundyne*, which he defined to be "a very precious stone." He also found different specimens of iron "prī-ātes," which he informed me was "a kīn of iron ore," and when I remarked: "Oh, then, it is valuable," he advised me to have nothing to do with it, as a "hull county of it ain't worth a ——!" As no two of his specimens agreed in appearance, nor any of them possessed the essentials of those minerals, I doubted his mineralogy; but contradicting him involved a useless argument, and I meekly accepted his information.

About noon, Boreas blustered himself into collapse, and we proceeded at such speed that we were in the alluvial flats near the lake at sundown. These flats undoubtedly occupy a part of the original Athabasca Lake, and, geologically speaking, not very long either. The soil in them along the

river is a rich, black loam, and the surface is covered with fine, large spruce trees, collectively the best timber I have seen anywhere in the territories. Close to the lake, some of the flats are not yet timbered, and some of them only partially so. On some of the last there are great accumulations of drift-wood, brought down by floods from the shores of the river. From Athabasca Landing to the lake is about 415 miles, but as this is only a little more than half the course of the Athabasca—all of which is heavily timbered—we can well imagine the largeness of the source of supply of the drift-wood.

LOOKING UP THE ATHABASCA, "AT DROWNED RAPIDS."

As this river rises in the Rocky Mountains, in summer it is fed by melted snows; consequently, like all such streams, it is subject to great fluctuations in height. It is not unusual for it to rise several feet in the course of a few hours. While I was at Grand Rapids in 1884, it rose four feet in onenight, but fell almost as rapidly. These fluctuations are governed by the weather in the mountains. A warm day or two turns so much of the snow into water that the narrow valleys are gorged. A cold day lowers the river below its usual level. The only time the water maintains its usual height is the autumn, when the snows are nearly all melted, and the weather in the mountains is colder.

Near the lake we passed some Chipewyan Indians camped on one of the arms of the delta. They were all sick with *la grippe*. Old and young, all came and stood on the bank, and raised their united voices into a heart-rending wail, while pronouncing the word of such import to Indians—"Medicine!" I was sorry for them, but had nothing to give them, nor could I help them, so I fired at them a concentrated volley of Chinook, before which they retired in confusion, and we passed in peace.

By noon we were in sight of the lake, but one of the channels we passed through was so choked with drift timber, that it was near sundown before we emerged from it. I passed through this channel in 1884, when it was perfectly clear.

Across the lake, eight miles to Fort Chipewyan, we quickly went, and made ourselves at home for a few days. We found nearly all the people of the place were away on the steamer *Grahame*, which was down Great Slave River at Smith's Landing, one hundred miles from here.

Before many of the cities of Canada were thought of, this was a flourishing trading post. In the last years of the 18th century, it stood on the south shore of the lake, some twenty or more miles south-east from its present site. From there in June, 1789, Alexander Mackenzie — afterwards Sir Alexander—started with some Indians on his voyage down the great river which bears his name, 1500 miles to the Arctic ocean, and three years later he started on his celebrated journey up the Peace, and across what is now British Columbia, to the waters of the

Pacific. He wintered on the bank of the Peace, nearly opposite the mouth of Smoky River. The crumbling remains of the houses he erected then were pointed out to me in 1883. In the summer of 1793 he crossed to the sea and returned.

Early in the present century the post was moved to its present site, where it will probably remain while it exists. It is situated on a rocky point at the west end of Lake Athabasca, from which there is a beautiful outlook. The lake here is dotted with rocky islands, some of them rising quite high. Four miles from the post a channel known as the "Quatre Fourche," leaves the lake, and connects its waters with Peace River. This channel is the highway from the Fort to Peace River, yet it can not be called a part of that river, for, when the lake is high and the river low, the waters flow through it into the river, and *vice versa*. It is narrow but deep, and resembles a canal cut through the alluvial flats, which now, as at the mouth of the Athabasca, occupy a part of the original lake. This canal is nearly thirty miles long. The passage to Great Slave River, locally known as River de Rocher, and the distance from the post to "Great Slave" or "Peace" River, is about thirty miles long. A few miles down this stream, a ledge of rock crosses it which causes a ripple in low water. The *Grahame* has sometimes touched when crossing, but has never been seriously delayed. In ordinary water, however, she has no trouble.

I remained several days at Chipewyan getting observations to determine its position, from which I deduced its latitude 58° 43′ 02″ and longtitude 111° 10′ 24″.

The lake here lies between two widely separated geological formations. The last rock exposures on the south side are cretaceous sandstones; the north shore is formed of Laurention gneissoids.

Generally there is very little soil near the post on the north shore. At the post there is a comparatively large area of sandy soil, which is utilized as gardens by the Hudson's Bay Company, the Anglican Mission and a few of the Company's servants. The Roman Catholic Mission is across a bay about a mile west of the post. This mission, some years ago, drained a small lake and swamp into the lake and a portion of this drained area they still cultivate. On this was grown wheat which won a gold medal at the Centennial Exhibition in 1876. The fact that such grain was grown upwards of 1,000 miles farther north than Toronto helps us to realize the importance of our great North. We may qualify this fact with as many failures as we may; it is still a fact—such wheat has several times been grown in the past, and can be again. I have seen potatoes grown at this post which in yield, size and quality, would compare very well with the same tuber in any part of Ontario.

Several head of cattle are kept at the post and mission. The hay for their sustenance is generally cut on the alluvial flats along the south and west shores of the lake, and hauled across in winter. In summer they graze on the flats between the granite hills back of the post. There are numerous places around the post where the rocks have been worn by glacial action.

Great numbers of fish, principally white fish, are caught in the lake near the post, and generally near Goose Island, about fifteen miles south-east from the post, but sometimes the fisheries have to be moved to other places. In the fall of 1888, the Hudson's Bay Company required thirty six thousand, the Roman Catholic Mission twelve thousand, and the rest of the people at least thirty thousand fish. These fish would probably average three pounds each; thus we have one hundred and seventeen tons for less than two hundred people. But it must be borne in mind that fish, here, is the principal

article of food for man, and the only one for the dogs.

This is the See of the Roman Catholic Diocese of Athabasca-Mackenzie. The mission comprises a church, nunnery, residence for the clergy, and schools.

The post was for a time the See of the Anglican Diocese of Athabasca, but the seat of this diocese was some years ago moved to Vermillion on Peace River, two hundred and seventy miles from here.

On Monday morning, July 27th, we started for Smith's Landing on the Great Slave or Peace River. A word here in explanation. On all the maps of this region published, the river formed by the confluence of the Peace and Athabasca is named the Great Slave, but by the people in the district it is generally known as the Peace. Often when speaking of the Great Slave to people there, I have had to explain myself. There is really no reason why it should not be called the Peace down to Great Slave Lake, as it is principally formed of the waters of that river, which discharges, I would say, at last twice as much water as the Athabasca does, at the junction. It would be just as reasonable to call the St. Lawrence below its junction with the Ottawa by some other name, as to call the Peace below its junction with the Athabasca by any other name than the "Peace."

R. C. MISSION FARM, CHIPEWYAN,
on which the Gold Medal Centennial Exhibition wheat was grown.

Just before entering the Peace River, we passed a large camp of Chipewyan Indians. They, along with those I have mentioned on the south side of the lake, had just returned from a trip to Athabasca Landing, where they went in the spring with their furs. They had heard that furs sold much higher at Edmonton, and determined to test the matter. So in the early spring, they had a small scow built for themselves, and hired a guide, and with their families and dogs, they started to make the ascent of the Athabasca to Athabasca Landing, and thence to make their way to Edmonton. This incident shows how changed they are becoming. A generation ago they would hardly have ventured so far out of their country, in such numbers, on such an errand.

Like all the other people in the country, they were down with *la grippe*. We endeavored to pass quietly by; but one old woman saw us and gave the alarm, when out they all came, wailing forth the word "Medicine!" in most dismal tones, and at the same time keeping up the most violent coughing, all vieing with each other who would produce the best, or rather worst, cough. They kept it up as long as we were within hearing, and, no doubt, thought us very unfeeling for passing without calling. Had we stopped we would have had to refuse a request from everyone in the camp for tea and tobacco. That one or two met with refusal would not deter every one, in his turn, from repeating

the solicitation. All Indians appear to think white men ought to part with any, or all, of their goods at their request, but very few of them will give anything to a white man until they are well paid for it; not even after they have been most generously treated. In fact, generosity, generally, has a negative effect on them, and to be grateful is, as a rule, something foreign to their nature. I know there are some exceptions to this rule, and I know also that many people who have had no experience with these Indians will shake their heads and mutter: "Absurd!" just as a few who have had experience will exclaim—"Prejudice!" Well, the prejudice is not on my side, as the vast majority of people who have lived near them or have had occasion to depend on them can testify.

I can illustrate this trait by referring to the journey these people made to Athabasca Landing. They and their fathers had traded with the Hudson's Bay Company for generations, and, whatever faults the Company may have, it certainly always treated the Indians kindly—yes, more than kindly—fatherly. It made money by them, it is true, but it has also lost much extending help to them when others would not, or, anyway, did not. I have myself often known the Company to go to much expense and trouble to relieve starving and helpless Indians. And at every post there are always several old and helpless people entirely dependent on the Company's bounty, which may not be very munificent, but it keeps them alive, and in comfort compared with what they would experience if with their own people. Now those Indians who had gone to Edmonton to sell their furs had realized all this; yet, because the Company's people at Chipewyan would not pay them what they were told they would get five hundred miles nearer the civilized world, they undertook a journey which most men would without hesitation say would not cover the extra trouble and expense by the difference in prices between the local post and Edmonton. Their own time is valueless to them—at least they look at it in that way—*until you engage one of them.* And they cannot, or will not, understand why goods should cost more at one point than at any other; so they considered that any extra price they got at Edmonton was clear gain, notwithstanding that they built a scow and travelled continuously for two months to get there and return to their home market, where great expense had been incurred to get in produce specially for them; which produce I have no doubt they went begging for as soon as what they got at Edmonton was done.

(To be continued.)

IN NORTH-WESTERN WILDS.

(The narrative of a 2,500 mile journey of Exploration in the great Mackenzie River Basin.)*

BY WILLIAM OGILVIE, D.L.S., F.R.G.S.

II.

BETWEEN Chipewyan and Smith's Landing, about one hundred miles, there are two or three ripples caused by ledges of rock, but there is nothing to interfere seriously with the passage of the *Grahame*. Every season she makes two or three runs from Chipewyan to McMurray, and as many down to Smith's Landing. The combined distance is about 300 miles by the route the steamer takes—though a few miles less by the canoe route. As two round trips make 1200 miles, and three make 1800, and there is a run of 500 miles up Peace River, (sometimes there are two runs), she covers 2000 to 3000 miles each season.

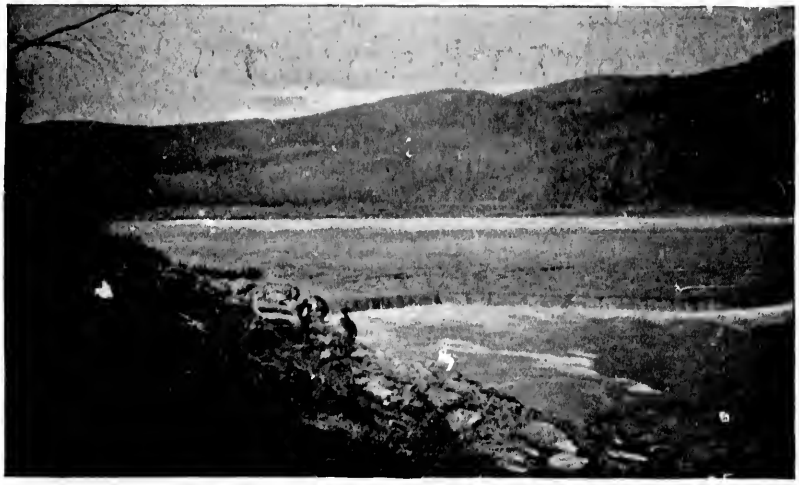
Smith's Landing is at the head of a series of rapids in Great Slave River. The aggregate fall in all is about 240 feet, in a distance, by the river, of about sixteen miles. The Hudson's Bay Company some years ago constructed on the west side of the river, past these rapids, a waggon road, over which all their supplies for the Mackenzie River District are handled in carts and waggons. By this road, the distance from the Landing to Fort Smith, at the foot of the rapids, is about fourteen miles, of which only a short part, near the south end, can be called bad. A great part of it winds among sand hills which are thinly covered with Banksian pine, or, as it is known in the country, pitch pine. This is said to be the worst or best place in all the North-West for flies, which, in some years, reduce the oxen used for transport to skeletons. It is even said that oxen have been killed by them.

Fort Smith is on the west bank of the river, at the lower end of the rapids. The soil around the fort is generally sandy; the surface knolly, and pretty well wooded with small poplar, some fair spruce and much Banksian pine. As the Hudson's Bay Company's steamer *Wrigley* can get no farther up than here, the company has quite a large store-house on the bank, in which the goods brought over the portage are stored until the *Wrigley* comes for them.

The rapids are caused by a spur of the Laurentian rocks which extend northward from Lake Athabasca to and beyond Great Slave Lake. It is curious to note that Great Slave River is, from the lake down to the foot of the rapids, a pretty sharp boundary between the Laurentian and sedimentary rocks in this district. Very seldom are Laurentian rocks seen on the west bank of the river, and just as seldom are sedimentary rocks seen on the east bank. At the head of the rapids, Laurentian rocks are seen on both banks, but about two miles below, the older rock gives place on the west bank to a thinly bedded rock which in places holds small nodules of gypsum. This rock is very similar in appearance to the rock associated with the extensive gypsum beds on Peace River near Peace Point, and very probably the same formation includes all the intervening country.

Below the rapids, the Laurentian rocks appear to trend eastward, while the river bears westward, and between these and Great Slave Lake, with the exception of a cliff, called "Bell's Rock," on the left bank, about seven

* The illustrations are from photographs by Count de Sainville and others.



ON THE ATHABASCA RIVER.

miles below Fort Smith, no rocks are seen along the river.

About twenty miles west from Fort Smith, the salt springs of Salt River are situated. They are about fifteen miles in an air line from the mouth of Salt River, which is about twenty miles down Great Slave River from Fort Smith.

The evaporation of the waters of these springs leaves little mounds of salt around them. From this source is supplied nearly all the salt used in the Mackenzie Valley. Capt. Back, in his Narrative of the Arctic Land Expedition to the Mouth of Great Fish River, tells of visiting them on the 5th of August, 1833, and says: "And on arriving at the proper spot we filled our five large bags with pure white salt in the short space of half an hour. There were no mounds like these seen in 1820, but just at the foot of the hill which bounds the prairie in that quarter, there were these springs, varying in diameter from four to twelve feet, and producing hillocks of salt from fourteen to thirty inches in height. The streams were dry, but the surface of the clayey soil was covered, to the extent of a few hundred yards towards the plain, with a white crust of saline particles. The plain itself had been trodden into paths by the footsteps of buffalo and other herbivorous animals." Mr. R. G. McConnell, of the Geological Survey Staff, visited these springs in August, 1887, and his description of them corresponds generally with Capt. Back's.

The Hudson's Bay Company has a garden at Fort Smith in which good potatoes and other vegetables are grown. There are also, on the east bank of the river and opposite to the post, many Indian houses, the inhabitants of which cultivate patches of ground, raising good potatoes therefrom, and this helps out their fish and meat stores.

On both occasions of my passing Fort Smith, I was too much hurried to converse with any of these Indians, but have learned from the whites around that some of them make extended hunting excursions eastward from here, following some stream to the vicinity of the waters of Hudson Bay, presumably at Chesterfield Inlet.

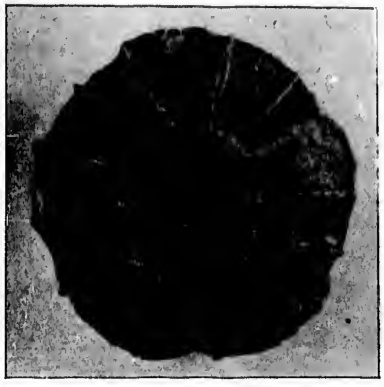
On my arrival at Fort Smith, I found the Hudson's Bay Company's steamer *Wrigley* there, loading for her down trip. I arrived there on the afternoon of the 30th July, and spent the greater part of that night getting observations to determine the geographical position. The resultant latitude was 60 01′51″ and longitude 112° 00′05″ W. The following evening the *Wrigley* started for Fort Resolution, on Great Slave Lake, and on the way down I obtained much information of value from Captain Bell, commander of the steamer, concerning the depth of water and the obstacles in the route. To render this information more intelligible, I will give a short description of the *Wrigley* and the route she travels over. This steamer was built at Fort Smith by the Hudson's Bay Company, in 1886, and made her first trip in 1887. As in the case of the *Grahame*, previously mentioned, the magnitude of such an undertaking, small as she is, can be appreciated when we know that every piece of lumber used in her construction had to be sawn by hand. All her machinery had to be transported upwards of 100 miles by horses, over somewhat bad roads, and then taken nearly 240 miles in scows, and 300 on the Company's steamer *Grahame*. Her dimensions, as given to me by Captain Bell, are eighty feet keel, fourteen feet beam, five to six feet draught at stern when loaded, and four to five at bow. Her propeller is a four and a half foot four-bladed screw, with adjustable blades. Her engine, manufactured by the John Doty Engine Co., of Toronto, with about 60 pounds pressure will drive her about eight miles an hour, but she can be driven ten. In the course of a season, the requirements of the Company's service necessitated her travelling about 6,500 miles. Her maximum load is about thirty tons.

Going down the Great Slave River, Capt. Bell kindly pointed out to me the shallow places and gave me the depths of water in each of them. Just below Fort Smith there is an extensive bar, but there is a channel through it which always affords plenty of water for the passage of the *Wrigley*. The shallowest place in the river is beside an island known as Big Island. The lowest water Capt. Bell ever experienced in the country, and the lowest he recorded, (by the way, it is generally admitted to have been unusually low), was six feet here; at average height there is nine feet, and at the date of my passage (1st August) there was thirteen feet. This shoal is about 200 yards across, and is on the left side of the island. The other channel is much the wider, but is full of sand bars, and, unless in very high water, the *Wrigley* could not get through it. Capt. Bell found in all the other parts of the river from twelve to thirty-six feet of water at average height. As is usual in all

LESSER SLAVE LAKE POST,
West end of Lesser Slave Lake.

such places, there are bars across all the mouths where they empty into the lake. On the one through which the steamer enters the lake, there is at very low water a depth of five and a half feet, and at high water, eight; the usual depth is six to seven, but this varies a good deal with the force and direction of the wind, a south-westerly wind lessening it and a north-easterly increasing it.

Owing to the displacement of the channel marks by a violent storm a few days before our arrival, the boat ran aground on the bar, with no other result than a couple of hours' detention.



SEPTARIAN NODULE, FROM MACKENZIE DELTA.

This gave the Professor a much desired opportunity to air his experience as a steamboat-man. He immediately took the captain into his confidence, told him of his long experience on Red River and Lake Winnipeg steamers, and advised him how to get the *Wrigley* off the bar. "You see Captain," he said, "whenever our boat ran on a bar, the first thing the captain did, was to ask, 'How is she heading?' Then the wheelsman sung out her course; the captain then said, 'Hold her there;' the bells were then rung to back her hard; the wheels were then backed until she came off." The Captain was inclined to resist this interference, but seeing me smiling at him, he gave his orders and came over and asked me what kind of a fellow that was. We had a hearty laugh at this idea of holding a boat to her course when aground and when the only object was to get her off in the easiest way possible. Though the crew of the boat consisted, with the exception of the Captain, engineer and his assistant, of half-breeds and Indians, they greatly enjoyed the Professor's display of nautical skill, and soon began to mimic his voice and swagger.

We expected to reach Fort Resolution before night, but this detention make it quite dark when we rounded Mission Island and came in sight of the Fort, which, with its houses all lighted up for the night, looked quite pretty. This post is situated on a sandy point five or six miles from the main mouth of Great Slave River.

The country all around it is flat and alluvial, and no doubt the land immediately adjacent was at one time a part of the lake. As the river combines the waters of the Peace, Athabasca and all the streams flowing into Lake Athabasca, it is of considerable volume, and, as the country along its course from Fort Smith to the lake is all clay and sand, it is continually bearing to the lake a great quantity of sediment, which is slowly filling up that part of the lake in the vicinity of its mouth.

Capt. Bell informed me that in his passages around and across the Great Slave Lake, he had done much sounding and found the depth to be, generally, at two miles from shore four fathoms, at six miles twenty fathoms. In mid-lake, on the way from the mouth of the Great Slave River to the head of Mackenzie River, he generally found upwards of forty fathoms, and in places sixty fathoms gave no bottom In the arm of the lake on which Fort Rae is situated, he found, fifty miles

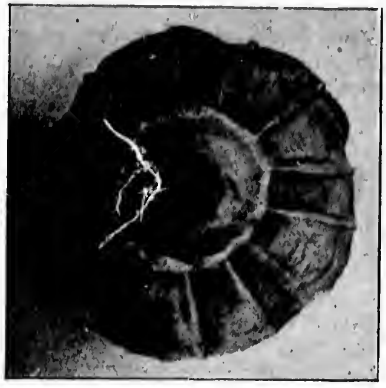
below Rae, twenty fathoms, thirty miles from Rae, three fathoms, eighteen miles two fathoms, and seven miles seven feet, a depth which continued up to Rae. The bottom in this arm he found muddy, with many boulders in it.

This lake, as laid down on our maps, is about 325 miles in an air line from end to end, and, exclusive of bays, is, in its widest part, about sixty miles across. Its longer axis lies in a north-easterly direction from its west end. No complete survey has yet been made of its shores; consequently our geographical knowledge of it is, in part, vague. Between the mouth of the great Slave River and the head of the Mackenzie, the adjacent country is mostly low and flat, and covered with the timber peculiar to the north, that is, spruce and poplar on the flats and hill-sides, with, on the heights, Banksian pine, or, as it is generally known in the country, "jack" or "pitch" pine. In some of the swamps some tamarac is found, but is seldom large enough to be of much service. The soil along the lake-shore is generally sandy.

About thirty miles west from Resolution, bituminous lime-stone crops out on the shore. This seldom rises more than twenty-five or thirty feet above the water, and it extends many miles. In some places it is so saturated with bitumen that it is quite black on a freshly broken face, and when put into a fire, soon gives off strong fumes of petroleum and a black smoke. No other rock is visible until we come to the head of the Mackenzie, where, on the south side, a low outcrop of apparently the same formation occurs.

Between the Great Slave and Mackenzie Rivers four streams entitled to the appellation of rivers enter the lake, but only one of them,—Hay River—is noteworthy as a stream. At its mouth it is about 200 yards wide, but I understand from accounts I have heard of it, that it is not much over half this width in general. It is also reported generally unnavigable for anything but canoes.

About thirty miles in an air line from the mouth—probably fifty or more by the river—are situated the Falls, named by Bishop Bompas, Alexandria Falls, in honor of the Princess of Wales. These falls are two in number, and about a mile apart. The upper one is a sheer drop of about eighty feet; the lower one, not so precipitous, has a drop of about fifty feet. It is said that when the water in the river is high, they are fine sights.



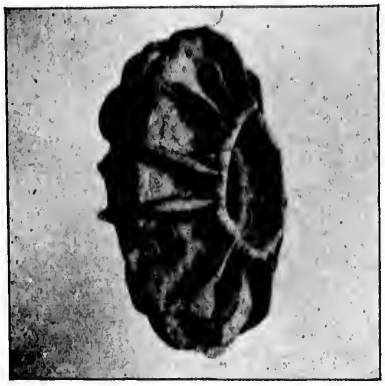
SEPTARIAN NODULE, FROM MACKENZIE DELTA.

From credible accounts which I got of this river later on, it rises in a ridge of hills sixty or seventy miles north from Fort St. John, on Peace River, in about latitude 57° and longitude 120° 30′. By my observations its mouth is in latitude 60° 52′ and longitude 115° 58′. Its length, as the crow flies, is thus upwards of 300 miles, but its actual course must be nearly double that distance. In one part of the course it runs parallel with Peace River; and from Vermillion, on the latter river, it is said to be only about forty miles across to Hay River.

Several rivers of considerable size discharge into the eastern half of the lake, but of only two is anything very definite known. One is Hoar Frost

River, which Captain Back ascended in 1833, and which tumbles into the lake over a precipice sixty feet high, forming a splendid fall. The other, Captain Back calls the Ah-nee-dessy River. He describes it as almost one continuous rapid, with two cataracts on it quite close to the lake: these he named respectively Parry and Anderson Falls. The former appears, from his description, to be between four and five hundred feet high, and, for "splendor of effect," he says it was the most impressive spectacle he had ever witnessed. Of Anderson Falls he only says, "it is deep and perpendicular." The lake has an area of about 10,400 square miles, and ranks about fifth in size on this continent.

There is a place in the narrows, before we come to Christie's Bay, which never freezes. Back mentions this, and says it is called Tal-thel-leh, and reports that the observations of two writers confirm his account. The fact was mentioned to me at Resolution by several, but I could learn no cause for it. No up-flow from the bottom was observed by any of my informants, but I do not think they looked for any such. As the lake is deep here, it is possible that no effect of springs could be observed, though it is very probable that the absence of ice is caused by deep-seated springs.



SECTARIAN NODULE, FROM MACKENZIE DELTA.

There are several tar or bitumen springs on the north side of the lake, near Pointe aux Esclaves, from which tar has been collected in the past for boat-building.

The first white man to visit it was Samuel Hearne, who reached it in December, 1771. He crossed it and ascended Great Slave River about forty miles, and leaving it, travelled eastward. Hearne called the lake "Athapuscow Lake."

At Fort Resolution I took observations to determine its position, which I found to be in latitude 61° 10′ 35″ longitude 113° 51′ 51″.

Trading has been done here for over a century, houses having been erected at the mouth of the river in 1785. At the present site of the Fort are situated the Anglican and Roman Catholic Missions. The Company and the missions, also some of the people employed at the Fort, have gardens in which they raise potatoes and other vegetables of good size and quality. The Company generally grows a little barley, which usually develops well. Wheat has also been tried with success. At Hay River, where the Company some years ago had a trading post, some Indians now reside most of the year. They have several lots of ground under cultivation, in which they grow potatoes of very good quality and size. An aged Indian, who may be considered a permanent resident here, some years ago bought from the Company two calves, which he so cared for that at the time of my visit in 1891 he had seven or eight head. Some weeks before my arrival he had sold a heifer to the Roman Catholic Mission at Resolution. At the time of sale, payment was not completed, the Fathers being short of goods. They took advantage of my passing the point to send the balance in the form of tobacco, cloth, twine, and other articles. I inquired for the old man by name, found him and delivered my charge. He opened the package then and there,

examined the goods and announced himself satisfied. He made a distribution of some of the tobacco to the other Indians, sat down by my camp-fire, and enjoyed a smoke purchased with his first sale of cattle. The old man's face was a picture of perfect contentment: but the others looked on him with envy, and his example, in all probability, was wasted on most of them, for if the cattle belonged to them they would have killed and eaten them the first time they were short of provisions, and the fact of owning such a supply would be a prime motive for their idling and thus creating want. The old man cut hay for winter use on flats around the mouth of the river. Though they milked the cows, no attempt was made at butter-making. I fancy the old man had about reached the limit of accumulation with his herd, as he found it considerable trouble to cut and save sufficient hay for the number he had.

VIEW FROM FORT SIMPSON AT JUNCTION OF MACKENZIE AND LAIRD RIVERS.
Mackenzie on left, Liard on right, Grow Cap in centre.

On my way from Resolution to Hay River, we were wind-bound at Dead Man's Island, thirty-three miles from Resolution. This island is named from the occurrence there of what was said to be a fight between Indians from the south, and the native Indians, but I could learn nothing positive or definite about it. The supposed number of killed, as stated to me by different parties, varied from fourteen to two hundred. A half breed who was with me on the island told me that years ago its surface was strewn with human bones, but, though I made much search, I could not find a trace of any bones. This fight is said to have occurred about sixty-three years ago; and from some accounts I got of it, it seemed more like a series of murders than a fight.

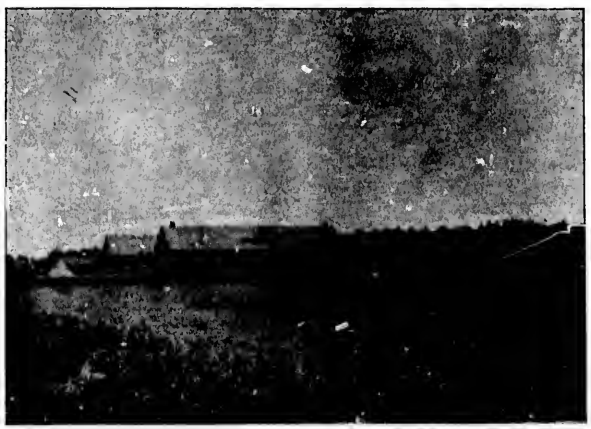
We left Hay River in the early morning of the 16th of August, and as we had a fair sailing breeze we proceeded gaily with sail and paddle, and had high hopes of getting well into the Mackenzie that evening, but the breeze increased until after we rounded Stony point, some fifteen miles from Hay River, it was a gale, and we fain would have landed, but we could not, as we certainly would have been swamped in the attempt. Several times we were nearly swamped by breakers, but we fortunately escaped. With our sail all spread, we flew from wave to wave at a lively rate, and just as I was wondering whether or not we would weather it to the Mackenzie, which was yet some eighteen miles away, I saw breakers between me and shore, and recollected passing two low reefs at this point in 1888. They were half a mile or more to leeward; the canoe was headed for them, and in a few minutes we were in their shelter. As they were less than a quarter of a mile from shore, the waves were sufficiently subdued by them to enable us to land, but not without some risk of swamping.

High winds were now the rule for some days, and we did not get into the great Mackenzie until the 19th.

The Professor having never seen a

large river, was very anxious to have his first view of the river and contemplate its vast proportions. His anxiety was manifested in such original expressions that it was a source of amusement to us, and, at last, when on the afternoon of the 20th, we passed the mouth of Beaver River and were fairly out of the lake, I said, "Professor we are in the river now," he was spell-bound. He gazed around, with distended eyes, for some time, then turned to me and said, "Why the Saskatchewan a'int in it; this is an ocean; there must be barrels of water, here ! How deep is it ? Sound and see." We found seventeen feet. As the river here and down to Fort Providence is from two to three miles wide, he was in a high state of admiration all the way down.

We now had a current of two-and-half to three miles per hour in our favor, and made fine time.



FORT LIARD.

Near a place known as "Bi[illegible] point," we saw a smoke, went to it and found a Roman Catholic priest and two Indians, who were on their way from the fisheries at the head of the river, to Providence, some fifteen or sixteen miles from here, and had stopped to make tea and have a smoke. As we thought it would be late when we would reach the post, we concluded to have a lunch here, too; so we landed.

A few minutes afterwards the good priest bade us good bye, telling me that he would inform the people at the post of our approach. I thanked him, but at the same time thought "May-be you will." For he had two Indians to row his boat, and I knew they would do their utmost to beat us into the post, and proposed to Charlie and the Professor that we try them a race. To this they at once assented. We hurriedly ate our bite, packed up, and shot out into the river; but by this time the other boat was only a speck in the distance. In a short time it began to show plainly, and we put our best strokes forth. The other party, too, were pulling their best, as I could see with my glass, yet we were hauling up to them in grand style, when up came a fair breeze and up went their sail, which was all ready, but, alas! ours was stowed in the bottom of the canoe, and would cost us more time than it would gain us to get it out. We plied our paddles with all our power, but the Indians rowed with equal vigor, and, with the aid of their sail, for four or five miles almost held their own. Then the wind fell away, and we made up to them and passed them with ease. The look of utter disappointment and chagrin on the faces of the Indians was such as we seldom see: but the good priest congratulated us on our prowess and on the sailing qualities of our canoe. I had not the heart to chafe

him about carrying the intelligence of our approach, or to leave him; so we continued together and arrived at the post at dark on the evening of the 20th.

At Providence, I took the necessary observations to determine its position, which I found to be in latitude 60°20′38″, and longitude 117°58′43″.

The usual Hudson's Bay Company's buildings are here, also a Roman Catholic church and nunnery and the necessary residence for the clergy. It is situated on the north bank of the river, about forty miles from Great Slave Lake, and fifteen miles above Little Lake. The country around it is all densely wooded, but quite an extensive clearing has been made around the post, and both the Company and the Mission cultivate several acres of ground. Potatoes and other vegetables are grown with much success, and barley is equally successful.

VIEW ON LIARD RIVER.

The Company almost every spring sows some wheat, which nearly always gives a good return of a fine sample. There is a hand mill here with which they grind the wheat and make a coarse flour, which is made into good and wholesome bread. While here in September, 1888, I ground enough of the previous year's crop to make a small loaf, which I had my cook bake for me. The flour was not as white as our patent-process flour, but the loaf was very palatable nevertheless. I will now state what may seem incredible. The entire crop planted at Fort Providence in 1891, was devoured by grasshoppers. I went over the Company's wheat field, but could see only the butts of the stalks half an inch or so above ground. That such a thing should occur 1,150 miles nearer the pole than Toronto, gives one a truer conception of our frozen north than many of our people entertain. The season was exceptionally dry, and therefore favorable to the propagation of the locust. The Roman Catholic Mission suffered in the same way. The soil here is a dark clay which, when mixed with the vegetable mould of the forest, makes a nice compound for farming on.

It is proper, here, to insert some information I got from Capt. Bell relative to the navigability of the Mackenzie River. Many of the facts stated take me far beyond the limits of my journey, but their general interest will justify the ramble.

As the head of the river, as before remarked, is very wide, several miles consequently may be expected to be, and are, shallow. Search was made here for a suitable channel for the steamer, and of course the notes furnished refer exclusively to this channel. In ordinary low water this channel affords a depth of about six feet, in very low water only five feet. In ordinary high water, such as there

was when I passed, there would be a depth of about nine feet, but in 1888 the depth must have been thirteen or fourteen feet. Capt. Bell thinks this shoal is the result of shoves by the ice on the lake, as quite close to it on both sides there is twelve to fourteen feet of water. It consists of gravel, and is, he says, only about two hundred yards across, so that improving it would not be a difficult undertaking.

Five miles below this there is another shoal known as "Trout Island Shoal." On this in low water there is six feet of water, but it appears that the depth is very irregular. This irregularity Capt. Bell thinks is due to the gravel at the bottom being scraped by ice and deposited in heaps. He thinks a proper search would show a deep channel all through here, but it would be very crooked, for it would wind about these gravel heaps. This shoal extends about a mile and a half. Through "Beaver Lake" in low water there is a depth of ten feet, in ordinary water twelve, and in high water fourteen. Of course this refers to the shallowest places in Beaver Lake.

R. C. CHURCH AND RESIDENCE AT FORT LIARD.

Providence Rapid, situated a little above Fort Providence, has five feet in the shallowest places in low water, and in ordinary stages six to seven feet. This extends for about two miles. Here, as in the before-mentioned places, a good channel could be found, but it would be very crooked, so much so that a steamer descending could not keep in it. From this rapid down to Rapid Sans Sault, the least depth in the lowest water was found to be twelve feet.

Rapid Sans Sault is caused by a ledge of rock extending across the river. Near the easterly shore the water drops over this a few inches and causes quite a commotion across the easterly half of the river. In the westerly half there appears to be a greater depth of water, and smoother current. It need hardly be said that the steam-boat channel is on the westerly side in the smooth water. Over the ledge, the lowest water found by Capt. Bell in a year remarkable for the low state of all the rivers in the country was six feet.

Over the ledge of the Cascade Rapids, which are caused by an obstruction similar to that at Rapid Sans Sault, Capt. Bell found a depth of nine feet in low, and eleven in good water. This rapid is near the head of the "Ramparts."

Close to the Ramparts there is another rapid known as "Rampart Rapids:" this, also, is caused by rock bottom in the river. In it in lowest water Capt. Bell gives the depth as eleven feet and in high water fifteen. It extends for about half a mile.

In his various passages of the Ramparts, Capt. Bell has sounded, without

finding bottom, with forty fathoms, which was the length of his sounding line. I have mentioned in my report for 1889 that Sir Alexander Mackenzie found fifty fathoms here.

Between the Ramparts and the delta, where the steamer leaves the main channel, less than twelve feet depth was never found, but Capt. Bell says that less might be found. Through the channels of the delta to Peel River no difficulty was ever experienced with the steamer.

LOOKING UP LIARD RIVER FROM FORT LIARD.

In Peel River up to the bar, five miles below Fort McPherson, the average depth of water is about fifteen feet. On the bar in low water the depth is about six feet, and with medium water seven feet.

Count de Sainville, a French gentleman who went down the Mackenzie in 1889 and spent much time in making an examination and rough survey of the delta of the Mackenzie and Peel Rivers and the coast line in the estuary of those streams, was good enough to give me all the information in his power. He assured me that the most easterly channel of the delta is the main one, and he never found less than a twelve feet depth in it down to tide water. The tides do not come up more than ten or twelve miles above the ocean, and the rise is not more than about two feet. What depth might be found beyond the mouth of the river he is not prepared to say, but bars there may naturally be looked for. This gentleman purposes making further and more complete examinations which will, no doubt, be of much interest and value.

Before resuming the narrative of my journey, I will give some notes I obtained from Capt. Segur, of the steamer *Athabasca*, and Capt. Bell, of the steamer *Wrigley*, giving the times over the various parts of their runs.

Steamer *Athabasca*, 2nd June, 1891, ran from Athabasca Landing, down to landing of Grand Rapids, in eighteen hours, with six large boats in tow. Up trip, started on 6th June, running time to Athabasca Landing, forty-eight hours. Second trip down, 13th July, running time down, fifteen hours and forty-five minutes. In 1890, her first down trip, made the second of June, was done in twenty hours and fifty minutes, and the return, 10th June, in fifty hours. This run was made in very low water.

The *Wrigley's* log shows the following averages between Fort Smith, the most southerly part of her run, and Fort McPherson, the most northerly: the distance between them is about 1,270 miles. From Smith to Resolution, average running time about eighteen hours; between Resolution and Providence, about seventeen hours, of which twelve and a half is in Great Slave Lake; between Providence and Simpson, about fourteen hours; Simpson to Wrigley, about ten and a half

hours; Wrigley to Norman, about fourteen hours: Norman to Good Hope, about thirteen hours; Good Hope to McPherson, about twenty-four and a half hours. The total running time is 123½ hours, a trifle over ten and a quarter miles per hour.

On her "up" runs, the following averages have been made: McPherson to Good Hope, forty hours; Good Hope to Norman, thirty-four hours: Norman to Wrigley, thirty-nine hours; Wrigley to Simpson, nineteen hours; Simpson to Providence, about twenty-eight and a half hours: Providence to Fort Rae, uncertain, but appears to be about thirteen hours: Providence to Resolution, about twenty hours: Resolution to Smith, about thirty-five hours: Resolution to Rae, about fifteen hours, and return about the same, as it is all lake water. The duration of these runs was varied somewhat by the force and direction of the wind. The total running time from McPherson to Smith, as shown above, is 215½ hours, which gives a rate of 5·9 miles per hour. The mean of the up and down rates is a fraction over eight miles per hour, which is said to be her normal speed.

For convenience of reference, I insert the following table of distances on the Mackenzie:—

	Miles.
Smith to Resolution.....	190·5
Resolution to Providence .	167·0
Providence to Simpson....	157·5
Simpson to Wrigley.....	134·0
Wrigley to Norman.....	180·3
Norman to Good Hope....	169·5
Good Hope to McPherson.	274·7
Total.....	1,273·5

We started from Providence on the morning of the 22nd August, and had to make way in the teeth of a fierce wind which more than neutralized the advantage the current gave us. On Little Lake we had to go ashore for some time, being unable to make headway. By dint of very hard work we got out of the lake and into the lee of the north shore, which enabled us to make such good headway that the last three hours we were paddling put us as far on our journey as all the previous part of the day.

The next day we were again unfortunate in encountering a strong headwind and heavy rain storm which delayed us considerably.

On the way I was surprised to note the difference in the level of the water as it was then and in 1888. In the latter year, from the head of the Line to Little Lake all the banks were submerged, in many places the water extending hundreds of yards into the forest. There must have been a difference of at least twelve feet in the level of the water in those years. Just fancy the difference in volume of discharge in a river a mile to a mile and a half wide, with a three mile or more current, and twelve feet of a difference in depth.

The evening found us well down the "Line," with every prospect of making Simpson on the morrow. For convenience I will recapitulate what I said of this part of the river in my former article in this magazine. "A short distance above the confluence of the Mackenzie and Liard, the Mackenzie narrows to an average width of a little over half a mile, with a generally swift current. This continues for seventy-five miles above Fort Simpson, and causes that part of the river to be called the "Line," from the fact that large boats cannot be rowed against the current, but have to be hauled by line, as has been previously described in this article."

We reached Fort Simpson early in the evening of the 25th August, and remained there until the forenoon of the 28th. The nights of the 25th and 26th being beautifully clear, I spent many hours taking observations. To most of the people around the fort it was most unusual to see a man gazing into the depths of a dish of mercury and then up at the sky. Not understanding it, they applied their

term for all forms of occultism and magic to it—"Medicine"—and I was dubbed a conjurer at once: but unfortunately for me the Professor came on the field, and my reputation was explained away in the most profoundly scientific manner. Those benighted people heard more about latitude and longitude, stars, astronomy and the glacial period that night than ever they had heard before, or, in all probability, ever will hear again.

The result of my "medicine" both nights put Simpson in latitude 61° 51′ 43″, and longitude 121° 42′ 52″. This is about nine and a half miles farther west than Thomas Simpson placed it in 1837, and about five further than Sir John Franklin put it.

The garden and field produce did not present the same fine appearance here that it did in 1888, as the season was unusually dry: yet, were it placed anywhere in Ontario, the people would never suspect from its appearance that it had developed outside of that province. Although a few grasshoppers were seen here, they were not in numbers sufficient to injure the crops. While at this post, we enjoyed the fine potatoes, carrots, parsnips, cabbage and peas grown in the Company's garden. They were as large and as fine-flavored as the best in any part of the country. Barley is yearly grown here, and, it may be said, always successfully, for any failures have been due to drought or too much rain oftener than to frost. Wheat has been tried several times, often successfully, but, as it cannot be utilized except through grinding with a hand-mill, it is not considered desirable to grow much of it.

The Company keeps a large number of cattle here. The hay for their winter food is cut on the uplands south of the post. To give an idea of the length of time they require stable fodder, I will insert an extract made from the Company's journals at the post. It shows, for a number of years the date of the breaking up of the ice, the date of the first appearance of ice in the river, and the time of the closing of the river:

Year.	*Ice broke up.*	*First drift ice.*	*River closed.*
1876	May 14th	Nov. 4th	Nov. 17th
1877	" 8th	" 1st	" 28th
1878	" 8th	Oct. 16th	" 26th
1879	" 3rd	Nov. 12th	" 20th
1880	" 7th	" 2nd	" 26th
1881	" 13th.	Oct. 12th	" 18th
1882	" 7th	Nov. 1st	" 30th
1883	" 1st	Oct. 28th	" 20th
1884	" 12th	" 11th	" 18th
1885	" 2nd	" 28th	" 20th
1886	" 13th	" 30th	" 25th

I may remark that the thickness of the ice (it being over four feet) helps to keep it in place in the spring, and the breaking up cannot be considered the same indication of the progress of the season as the same occurrence would be at Ottawa. The snow is generally all gone by this time, and often seeding is done before the ice leaves.

While at Fort Norman in the same year I made extracts from the Company's journals there, which, as that post is 318 miles further down the river and is in about the latitude of 65°, will be of interest here:

Year.	*Ice broke up.*	*First snow.*	*First ice.*	*River closed.*
1872	Not given.	Sept. 28th	Oct. 7th	Nov. 8th
1873	May 17th	Sept. 28th	" 21st	" 12th
1874	" 25th	Oct. 15th	Nov. 2nd	" 18th
1875	" 24th	Not given.	Oct. 23rd	" 9th
1876	" 19th	Oct. 10th	" 13th	" 9th
1877	" 12th	Sept. 25th	" 18th	Not given
1878	Not given.	" 23th	" 22nd	Nov. 7th
1879	May 9th	Oct. 3rd	" 20th	" 2nd
1880	" 22nd	" 7th	" 22nd	" 12th
1881	Not given.	" 2nd	" 7th	" 12th
1882	May 14th	" 9th	" 14th	" 14th
1883	" 11th	" 9th	" 24th	" 10th
1884	" 28th	rest of record lost.		
1885	No record.	No record.	No record.	No record
1886	"	"	Oct. 18th	Nov. 18th
1887	May 24th	Sept. 23rd	Oct. 5th	" 8th

In the above, the date of the first snow does not mean the permanent snow for the winter, which may not have come for a month afterwards.

The Liard River, up which we had to go, joins the Mackenzie just above Simpson. The point between them is scarped, and rises about 200 feet above the level of the water; it is locally known as the *Gros Cap*.

The Hudson's Bay Company officers and employés at Simpson, in 1887, organized a museum, which they entitled the Mackenzie River Museum

in which they preserve specimens of all the birds and beasts peculiar to the country. They also collect specimens of fossils, Indian work and curiosities—in fact, any article of note or interest, found in the basin, finds a home here. Capt. Bell of the steamer *Wrigley*, proved himself quite a skilful taxidermist, and must necessarily, from the number of specimens fixed when I was there, have devoted a great deal of time to this work.

Count E. de Sainville, a French gentlemen, who has spent several seasons around the delta of the Mackenzie, found a curious specimen in that vicinity, which he presented to the museum. As it appeared to me to be very curious and interesting, I took the liberty of bringing it away for the purpose of identification or classification. It is now in the Geological Museum in Ottawa, where it will remain for some time, if not always. On looking at it, most persons would at once pronounce it organic, but our geologists pronounce it a Septarian nodule, consequently inorganic; but it is very interesting and curious, nevertheless. As it is a very rare specimen, the pictures of it, which are here presented, will no doubt be interesting to many.

As this was the turning point on my journey, it will be interesting, before I start back, to present to my readers an idea of the facility with which one so minding may visit the Arctic Ocean by this route. We will presume we are in Ottawa or Toronto, and wish to visit the land of the midnight sun. Four days from our start, *via* the Canadian Pacific Railway, we arrive at Calgary: one day from Calgary we arrive at Edmonton, *via* the Calgary and Edmonton Railway. From Edmonton four days will be required to Athabasca Landing: this portion (about one hundred miles) to be made with the aid of horses. By timing ourselves to reach Athabasca Landing about the first days of June, we shall likely catch the steamer *Athabasca* at the Landing, and go down to Grand Rapids on her. From Grand Rapids it will take us three or four days to reach McMurray, and if we are fortunate enough to catch the steamer *Grahame* there, we shall reach Chipewyan in a day. Another day will take us to Smith's Landing, and another to Smith: if we are fortunate at Smith's Landing, we can get to Smith the same evening. If we meet the steamer *Wrigley* at Smith, and she is bound for McPherson, for which she generally starts about the last days in June or the first days in July, we shall likely reach McPherson in seven or eight days. The steamer has not heretofore gone farther down than the delta, but it is possible she may in the future go down to the Arctic coast and along it a short distance

From the foregoing we see that even with the present facilities we can reach the Arctic Ocean from Ottawa in about twenty-three days--let us say, to cover possible contingencies, thirty days—and return in about forty. On the way we shall pass through about 1,200 miles of beautiful prairie country, which extends almost to Athabasca Landing: and from Athabasca Landing to the Arctic Ocean, upwards of 1,800 miles, we have only ordinary river navigation, with the exception of a few miles on Lake Athabasca, and about 120 on Great Slave Lake. During the whole of the journey, we are likely to experience as pleasant weather as if we had remained at home, and it may be more pleasant. We are likely to see much that will interest and surprise us, and we shall certainly have a much clearer conception of the extent and value of our country. All the way to the Arctic coast we shall see timber and plants similar to much of what we see at Ottawa, and were it not for the absence of many of our trees, and the increased duration of daylight (which we would find at the coast to be of twenty-four hours' duration

autumn, (1898). In the light of actual occurrences these reports are pathetic. Two years before the war with the U. S., Admiral Cervera shows that he pointed out to his Government, through the proper channels, that the Spanish fleet was in no condition for service, owing to the lack of actual necessities on board the ships, brought about by the *indifference of the superior authorities and the neglect of the Cortes or Parliament to vote the requisite funds*. When war was upon them the votes were hastily granted, but it was then too late, because modern war material cannot be manufactured in a day, and even if it could, the neutrality laws, after war is once declared, very much restrict its purchase. When ordered to sail to meet the enemy Admiral Cervera wrote that the conditions of his ships was even worse than at the earlier period first mentioned, while the U. S. fleet had been much augmented and strengthened. Some of his ships were without even the guns intended for their armament, and all were short in ammunition supply (30 rounds per gun on ships going to war whilst on ours even in peace time 300-500 are carried), and the crews had had practically no target practice whatever. Before sailing the Admiral was able to obtain neither coal, nor charts of the American seas, and only half the quantity of biscuit required for the sustenance of his crews. His last letter before the final catastrophe outside Santiago ends with " the final result is not doubtful —God be with us—Good bye."

Is this not a pathetic story of brave men compelled to make themselves the victims of deficiencies they sought in vain to have corrected?—but in the face of these figures for the military expenditure of our country—low even when contrasted with our neighbours of the U. S., even before they undertook expansion, can it be wondered that Canadian Officers are anxious to obviate a similar fate? No Minister, no Member of Parliament, no citizen of Canada, would like to think his National Militia would suffer from a like cause were it suddenly mobilized for actual service—but in truth can we assert there is very much dissimilarity?

On the other hand as an instance of the most thorough preparation and every day readiness for service to be found among the armies of the world today, I might quote for your information an English writer, one who is an authority on such matters, and who selects as his example the German Army Corps stationed upon the French frontier at Metz :—

> " Between Metz and France is one long glacis unassailable by the invader, and when you have walked through one street of the old French city you can see that you are in the entrenchment of an army on a war footing. Infantry, artillery, cavalry, and the rest are all equiped as if for instant active service ; the stores are all to hand ; harness and carts lie ready by the side of the transport animals. Not a gaiter button is wanting ! In half an hour 30,000 men can be marching out of Metz with all the machinery and munitions of modern war · with all the stores and equipment needed for a campaign."

shore water, I cannot speak from personal observation on this point, but I have been told that in very low water many of the ledges would not permit a steamer to pass over them. There would, however, be water enough during a good part of the summer, or I am greatly deceived in the appearance of the place. This rapid, from head to foot, is about six and a half miles long. About ten miles above this there is a ripple over a gravel bar, where there is a large island in the river, but this would not hinder the ascent of a steamer such as I have spoken of. Between here and Fort Liard, there are two or three places where the current is very swift, but a steamer which would work her way up to them could easily ascend them.

Between Simpson and Liard no streams of any importance enter the Liard. About one hundred and five miles above Simpson the Nahanni enters from the west; it is about two hundred yards wide at the mouth. I did not learn anything concerning it, but as it comes from the mountains it is not probable that any extent of it is navigable. About fifteen miles above this another small river enters from the west. About one hundred and seventy-six miles above Simpson, Muskeg River enters from the east. It is an unimportant stream, little larger than a creek. It flows out of a small lake called Lake Bovie, which is fifteen or twenty miles from the Liard River.

Friday had been up the Nahanni "many days" as he expressed it, but he appeared to know very little of it. He described the country as all big mountains.

"Much game up there, Friday?"

"Wough, plenty."

"Any bears?"

"You bet your life, plenty bears!"

"Big?"

"Yes, big, plenty."

"You shoot him?"

"*No, me no shoot, me look!*"

This answer was accompanied by a, "well,-you - must-be-a-born - fool - to-think-I-would-tackle-a-grizzly - bear - alone" look, which amused me.

All the way from Simpson to Fort Liard it was a daily or bi-daily event to see fresh tracks of moose. Often the drippings from their wet sides, after swimming the river, had not yet been absorbed by the dry sands on the beach, which indicated that they had just passed. But we never saw any. It was annoying to us that we could not get sight of any, when we must have been so close to them. Not so with Friday. He "knew his man better," so to speak, and would quietly laugh at our expressions of annoyance at not seeing the animal, and remark, with the proud air of a professional to an amateur, "Umph, you no ketch him!"

Once, just as we rounded a long sandy point, one had passed so recently that the water from its body yet lay in drops and pools on the dry sand.

This excited even Friday a little, and he remarked, with flashing eyes, "No far!"

I took my rifle and walked up into the woods a short distance, more through a desire to stretch my legs than from expectation of seeing the moose; but Friday thought the latter was my object, and followed me, smiling in derision.

When well into the woods I gazed around me intently as though expecting to see the moose, and remarked *sotto voce* "Well; I wish I could see that moose!"

Friday could stand no more, broke into a loud laugh, and exclaimed, "You no kill him."

I determined to break up Mr. Friday's contempt, and sternly looking at him, asked, "No! What for me no kill him?"

He quit laughing at once, and civilly replied, "Too much stick (trees)," but I replied, "Me kill him through the stick!" making him understand by signs that I would shoot through

several sticks or trees; and, pointing to a spruce, 16 inches in diameter, standing close to a balsam poplar, or cottonwood as it is called in this country, twenty-six inches in diameter, I placed myself in line with them and fired at them.

It would be difficult to picture Friday's surprise when I showed him that the bullet had passed through the spruce, but when I showed him that it had also passed through the poplar, he stood speechless. After a little search, I found where it had grazed another spruce, passing through about three inches of it, and then passed into the ground a foot or more, whence I dug it out in Friday's presence. From that time until I parted with him, he was firmly of the opinion that I could kill anything anywhere, and he never spoke to me of not being able to shoot. He had seen me shoot across the Mackenzie River at Simpson, 1800 yards, and make pretty fair shooting, and did not express much astonishment; but seeing a bullet pass through forty-five inches of wood, and then a foot into the earth, imbued him with a very great respect for my gun. He did not fail to tell of this wonderful gun at Liard, and the natives there were all expectancy to see some wonderful things whenever they saw it in my hands. I made them understand that it was the gun the Great Mother's soldiers shot with, and how useless it would be for any one to seek shelter from it behind trees, or get away from it if they were in sight at all. I may say the rifle in question was the new magazine rifle adopted by the Home Government for the Imperial army, a modification of which rifle is now being prepared for the Canadian Militia.

We reached Fort Liard River, 182 miles from Simpson by the course of the Liard, in the evening of September 4th. Here I remained until noon of the 7th, getting the necessary observations to enable me to determine its position, which I found to be in latitude 60° 14′ 18″, longitude 123° 57′ 01″. This post has hitherto been marked on our maps as being in British Columbia, but it is sixteen miles north of the northern boundary of that province.

The Hudson's Bay Company for many years did a good trade here, but it is now run down to a very small amount. The Roman Catholic Church has a mission about a mile up the river from the Company's post, and both Company and Mission have a few acres under cultivation, on which they raise very good potatoes and garden stuff. The drought which prevailed elsewhere in the north, here, also, prevented the usual development of crops. At the date of my arrival the barley had been harvested several days, and though the straw was short, the grain was plump, hard and of fair yield.

Wheat has often been grown here successfully, but as it can only be used whole, it is considered better to grow barley, which can be and is much used as cattle food. Cattle are kept here, and seem to thrive as well as at other places in the country. At this post the soil is a rich black loamy clay, and the surface is thickly wooded all around. As seen from the high ground on the opposite side of the river, the country to the south and east appears undulating, rising into extensive ridges all heavily timbered. This condition is said to continue through to Hay River. In the valleys are many lakes, some of considerable extent, and many large swamps. I could not learn anything of the character of the soil, but it is fair to assume from the general character of the woods that it is of fair quality. While at this fort, I examined the daily journal of events kept at every post, for the purpose of getting some information as to the times of the general run of farming events, opening and closing of the river, or any other fact of agricultural, meteorological or general interest.

I will here make a few explanatory remarks with regard to these journals. It is a standing rule of the Company's

service that a journal of daily events be kept at every post, but each officer seems to have a different idea of what a daily event is, and there seems to be a want of continuity, so to speak, in the records, when there is a change of writers or officers; some officers aiming at making it what it was intended or ought to be, a chronicle, which could at any time hereafter be consulted with confidence regarding historical, meteorological and agricultural events in particular, and information generally.

Unfortunately many seem to have considered it an unpleasant duty, and put it off from day to day, until a long interval had elapsed, then gone at it in desperation and made the best record they could from memory, of course often omitting many items of interest and general importance. In many of the journals I have seen, there are great gaps, the officer at the place being absent on a journey, or sick, or otherwise unable to write the journal at the post.

Each recorder stamped his character in his entries as plainly as if it were a part of himself, which, after all, it really is. Some appeared to have enjoyed a quiet sit-down with a pipe and pen, and had a pleasant confidential chat with a friend, narrating their own doings, and hopes and fears in connection with them. Others seemed to have considered it an audience to whom they grandiloquently communicated their estimate of their own powers and ability. Others have been moralists, reflecting, with a sad smile and a shake of the head, on the shortcomings of those around them. Many have been witty, entering with much detail any ludicrous event that may have occurred, and embellishing it with amusing reflections and remarks. It is unfortunate that some common motive did not actuate every recorder, for the lack of system has made valuable references, in some cases, of little use.

The journals at Llard gave me the following dates and facts:

1878. Planted seed May 9th; reaped barley omitted; first ice drifting in river October 18th; ice set in river October 29th.

1879. Planted seed April 22nd; reaped barley, August 14th; first ice in river, October 15: ice set fast, November 7th.

1880. Planted seed May 7th; reaped barley, August 14; first ice in river, October 25th; ice set fast, November 9th.

1881. Planted seed, May 5th; reaped barley, August 12th; first ice in river, October 10th; ice set fast, November 13th.

1882. Planted seed, May 9th; reaped barley, August 22; first ice in river, October 16th; ice set fast, November 7th.

1883 Planted seed, May 3rd; reaped barley. August 10th; first ice in river, October 29th; ice set fast, November 9th.

1884. Planted seed, May 1st; reaped barley, omitted; first ice in river, October 10; ice set fast, October 29th.

1885. Planted seed, May 22nd; reaped barley, August 11th; first ice in river, October 23rd; ice set fast, omitted.

1886. Planted seed, May 7th; reaped barley, August 19th; first ice set in river, November 9th; ice set fast, November 20th.

1887. Planted seed, May 3rd; reaped barley, omitted; first ice in river, October 22nd; ice set fast, November 9th.

1888. Planted seed, May 9th; reaped barley, omitted; first ice in river, October 20th; ice set fast, November 5th.

1889. Planted seed, April 16th; reaped barley, omitted; first ice in river, October 28th; ice set fast, November 14th.

1890. Planted seed, April 30th; reaped barley, omitted; first ice in river October 15th; ice set fast, November 14th.

Potatoes are generally harvested about the 20th of September. The ice generally breaks up in the river about the 1st of May.

(To be continued.)