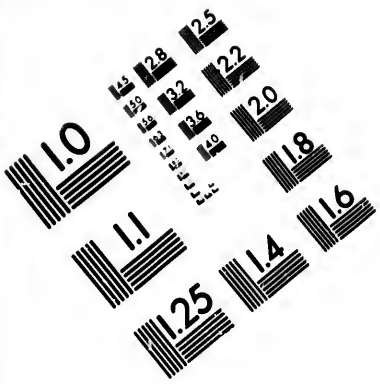


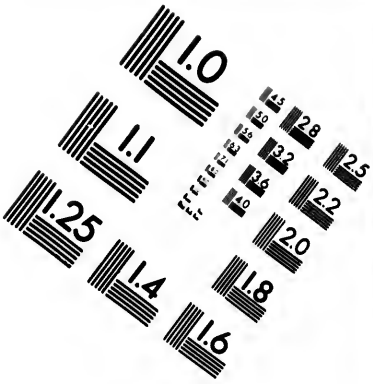
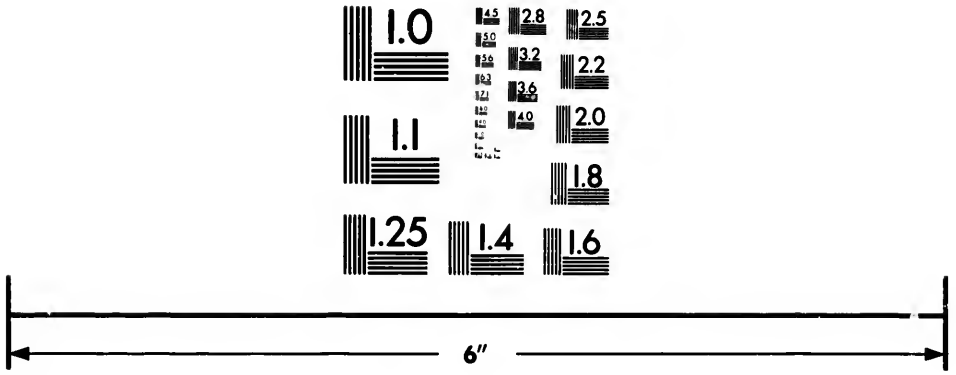
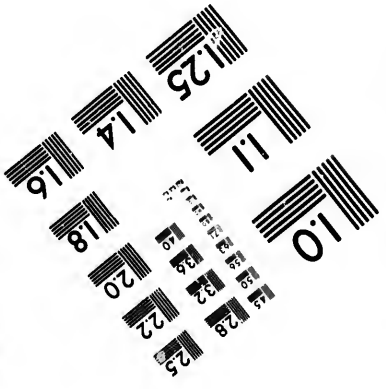


IMAGE EVALUATION TEST TARGET (MT-3)





Photographic Sciences Corporation

23 WEST MAIN STREET
WEBSTER, N.Y. 14580
(716) 872-4503

Technical and Bibliographic Notes/Notes techniques et bibliographiques

The Institute has attempted to obtain the best original copy available for filming. Features of this copy which may be bibliographically unique, which may alter any of the images in the reproduction, or which may significantly change the usual method of filming, are checked below.

- [x] Coloured covers/ Couverture de couleur
- [ ] Covers damaged/ Couverture endommagée
- [ ] Covers restored and/or laminated/ Couverture restaurée et/ou pelliculée
- [ ] Cover title missing/ Le titre de couverture manque
- [ ] Coloured maps/ Cartes géographiques en couleur
- [ ] Coloured ink (i.e. other than blue or black)/ Encre de couleur (i.e. autre que bleue ou noire)
- [ ] Coloured plates and/or illustrations/ Planches et/ou illustrations en couleur
- [ ] Bound with other material/ Relié avec d'autres documents
- [x] Tight binding may cause shadows or distortion along interior margin/ La reliure serrée peut causer de l'ombre ou de la distortion le long de la marge intérieure
- [ ] Blank leaves added during restoration may appear within the text. Whenever possible, these have been omitted from filming/ Il se peut que certaines pages blanches ajoutées lors d'une restauration apparaissent dans le texte, mais, lorsque cela était possible, ces pages n'ont pas été filmées.
- [ ] Additional comments:/ Commentaires supplémentaires:

L'Institut a microfilmé le meilleur exemplaire qu'il lui a été possible de se procurer. Les détails de cet exemplaire qui sont peut-être uniques du point de vue bibliographique, qui peuvent modifier une image reproduite, ou qui peuvent exiger une modification dans la méthode normale de filmage sont indiqués ci-dessous.

- [ ] Coloured pages/ Pages de couleur
- [ ] Pages damaged/ Pages endommagées
- [ ] Pages restored and/or laminated/ Pages restaurées et/ou pelliculées
- [ ] Pages discoloured, stained or foxed/ Pages décolorées, tachetées ou piquées
- [ ] Pages detached/ Pages détachées
- [x] Showthrough/ Transparence
- [x] Quality of print varies/ Qualité inégale de l'impression
- [ ] Includes supplementary material/ Comprend du matériel supplémentaire
- [ ] Only edition available/ Seule édition disponible
- [ ] Pages wholly or partially obscured by errata slips, tissues, etc., have been refilmed to ensure the best possible image/ Les pages totalement ou partiellement obscurcies par un feuillet d'errata, une pelure, etc., ont été filmées à nouveau de façon à obtenir la meilleure image possible.

This item is filmed at the reduction ratio checked below/
Ce document est filmé au taux de réduction indiqué ci-dessous.

10X	12X	14X	16X	18X	20X	22X	24X	26X	28X	30X	32X
						✓					

The copy filmed here has been reproduced thanks to the generosity of:

Thomas Fisher Rare Book Library,
University of Toronto Library

The images appearing here are the best quality possible considering the condition and legibility of the original copy and in keeping with the filming contract specifications.

Original copies in printed paper covers are filmed beginning with the front cover and ending on the last page with a printed or illustrated impression, or the back cover when appropriate. All other original copies are filmed beginning on the first page with a printed or illustrated impression, and ending on the last page with a printed or illustrated impression.

The last recorded frame on each microfiche shall contain the symbol → (meaning "CONTINUED"), or the symbol ▽ (meaning "END"), whichever applies.

Maps, plates, charts, etc., may be filmed at different reduction ratios. Those too large to be entirely included in one exposure are filmed beginning in the upper left hand corner, left to right and top to bottom, as many frames as required. The following diagrams illustrate the method:

L'exemplaire filmé fut reproduit grâce à la générosité de:

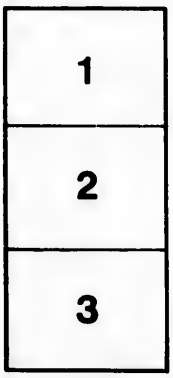
Thomas Fisher Rare Book Library,
University of Toronto Library

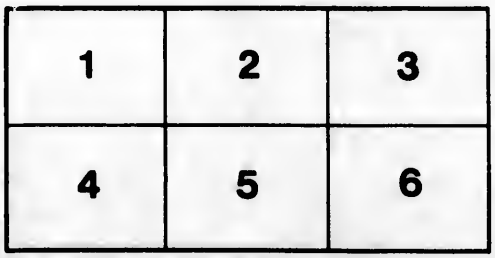
Les images suivantes ont été reproduites avec le plus grand soin, compte tenu de la condition et de la netteté de l'exemplaire filmé, et en conformité avec les conditions du contrat de filmage.

Les exemplaires originaux dont la couverture en papier est imprimée sont filmés en commençant par le premier plat et en terminant soit par la dernière page qui comporte une empreinte d'impression ou d'illustration, soit par le second plat, selon le cas. Tous les autres exemplaires originaux sont filmés en commençant par la première page qui comporte une empreinte d'impression ou d'illustration et en terminant par la dernière page qui comporte une telle empreinte.

Un des symboles suivants apparaîtra sur la dernière image de chaque microfiche, selon le cas: le symbole → signifie "A SUIVRE", le symbole ▽ signifie "FIN".

Les cartes, planches, tableaux, etc., peuvent être filmés à des taux de réduction différents. Lorsque le document est trop grand pour être reproduit en un seul cliché, il est filmé à partir de l'angle supérieur gauche, de gauche à droite, et de haut en bas, en prenant le nombre d'images nécessaire. Les diagrammes suivants illustrent la méthode.





32X

REPORT

—OF—

EXPLORATORY SURVEY TO HUDSON'S BAY

—BY—

WILLIAM OGILVIE, D.L.S.

REI

The Hon
The

Sir,-
instructio
The
three-fol
Mattawa,
the south
camingue
latitude
the latitu
traverse.
Secc
provincia
and Abit
to make
Thi
by the r
latitude
The
water it
streams
merged,
necessar
would h
would ha
was the
survey b
this dist
Main, th
travel ov
survey v
Thi
water, w
than the
the shor
and as c
in keepi
taken u
flooded
reason f
the she
point, a
An
as the m
around
1½

REPORT OF EXPLORATORY SURVEY TO HUDSON'S BAY BY WILLIAM OGILVIE, D.L.S.

OTTAWA, 20th January, 1891.

The Honourable
The Minister of the Interior,
Ottawa.

SIR,—I submit the following report of my operations for the past season, under instructions dated 18th March, 1890.

The object of the work entrusted to me, as set forth in those instructions, was three-fold:—First, to make a traverse survey of that part of the Ottawa River above Mattawa, and of Lake Temiscamingue, so as to connect some point in Mattawa with the southern end of the line marked on the ground at the north end of Lake Temiscamingue as the boundary between the Provinces of Ontario and Quebec. The latitude and longitude of the point in Mattawa being accurately determined, the the latitude and longitude of the end of the above line becomes known through the traverse.

Second, if practically convenient, to connect the north end of the above Interprovincial boundary line, situated on the watershed between the waters of the Ottawa and Abitibi Rivers, by micrometer traverse with some point on James Bay, and also to make a micrometer traverse of part of the shore line of this bay.

Third, to determine, by a series of moon culminations, and occultations of stars by the moon, the longitude of some point on the bay, also by zenith telescope the latitude of the same point.

The first and third of these objects I accomplished, but owing to very high water it was practically impossible to accomplish the second. As the shores of the streams and lakes along which I would have to make the survey were all submerged, landing from canoes would be difficult, and in making a survey it would be necessary to clear away quite an amount of brush and trees at each station, which would have caused so much delay that unless I remained there all winter the time would have been too short to complete the third and principal part of my work. I was therefore compelled to abandon this, and content myself with making a track survey between the head of the Quinze River and East Main on James Bay. In all this distance, with the exception of a few miles at Moose, Rupert's House and East Main, the courses are magnetic, and the distances estimated from the time taken to travel over each of them. At each of the three points excepted, a few miles of survey were made with astronomical azimuths and micrometer distances.

This could not be continued around the bay on account of the shallowness of the water, which, in many places between Moose and Rupert's House, is less in depth than the rise and fall of the tide, thus making a great difference in the position of the shore line at the different stages of tide water. The water is always muddy, and as one cannot see where to steer to keep off the bottom, much delay was caused in keeping close to shore, as had to be done when making a survey; thus, the time taken up in going from one point to another was so long that the incoming tide flooded the place around the station, making it impossible to set up a transit. For this reason I had to abandon altogether the idea of making an instrumental survey of the shore line of the bay, and simply took the magnetic course from point to point, and estimated the distance between them from the time and rate of travel.

An instrumental survey was made from Rupert's House along the beach as far as the mouth of Pontax Creek (about ten miles) and the position of several points around Rupert's Bay was fixed by azimuth from other points of the survey. The

most prominent point thus fixed was a high hill on the east shore of the bay, known as "Sherrick's Mount." This was so connected with the survey that its latitude and longitude referred to Rupert's House can be deduced from it.

From East Main I made an astronomical and micrometric survey from the Hudson's Bay Company's post down to the mouth of the river, and a short distance along the coast to the top of a high rocky island called "Dilly-dally," from which "Sherrick's Mount" could be seen, and the azimuth of the latter was determined from this point. As it stands not far from midway between Rupert's and East Main, the shore line between those two points can be very closely laid down.

ASTRONOMICAL OBSERVATIONS.

At Abitibi, Moose and Rupert's House observations were taken for latitude and time, the latter in order to approximate to their longitude by chronometer differences of time between the several points. I had intended to get a series of observations for time at some point on my survey of Lake Temiscamingue, to enable me to interpolate the error of my chronometer between two well-defined points at the extremities of my survey, one on the traverse from Mattawa and the other at my astronomical observatory at East Main. On my way up, pressure of time and cloudy weather prevented this, and on my way down stormy, snowy weather precluded all attempts at that kind of work. This necessitates the assumption that the chronometer rate was uniform over the whole journey, which is very likely not correct, and in that case there will be an undiscoverable error in the longitude of those three places as referred to East Main.

At East Main I had some difficulty in getting my astronomical transit mounted. As I took only the telescope and the auxiliary V's, made by Foster, of Toronto, to be used in mounting on a stump or other substitute for the tripod or stand, and I could not find anywhere near this point a tree large enough either to utilise the stump or part of the body for a post, I had to procure two pieces of timber, about 8 inches square and 10 feet long, from the Hudson's Bay Company there, and put them tightly together in the form of a St. Andrew's Cross, by a bevelled half mortise strongly fastened with screw bolts and heavy nails. The mortise was so placed that the distance from centre to centre of the ends of the arms was at one end 18 inches and at the other about 4 feet. The long end was placed in a hole in the ground about 5 feet deep; stones were then packed around it in such a way as to make it as steady as possible, the hole then filled in with gravel, and the transit mounted and adjusted. This proved, I think, as good a stand as any other would on the same kind of ground, which is a small, sandy ridge, surrounded by a swamp or quagmire. Unfortunately for the accuracy of my observations in the August-September lunation, the support was not satisfactorily steady, owing to the settling of the stones and gravel in the hole dug to receive the stand.

The observations taken at this point during the August-September lunations for the determination of longitude consist of three complete and one partial moon culmination observations, and two occultations. The latter, however, cannot be relied on, as they were observed under very unfavourable conditions—one of them in strong twilight in the morning; and as the star was less than the 4th magnitude, and only the immersion was visible, and that by the bright limb of the moon, it is at once apparent that the actual time of disappearance could not be very closely obtained. Add to this the difficulty caused by a strong gale of wind blowing all night at the time of observation, which caused much vibration in the telescope used, and necessitated holding the chronometer in the hand close to the head, and it must be seen that this can hardly be called an observation at all. The other was taken under much better conditions, but the haziness of the atmosphere rendered the star, when within a few seconds of disappearance, very dim, and altogether I cannot regard this one either as satisfactory.

The culminations, five in number, observed during the September-October lunation, were much more satisfactorily obtained, but the two occultations observed were

unfavourably situated, being too near the horizon, so that altogether the longitude deduced from them will not be so valuable as that from the culminations.

Twice I observed the re-appearance from eclipse of Jupiter's satellites; one of them (the second satellite) gave me a result agreeing closely with that deduced from the culminations, but the result obtained from the other (the first satellite) differs considerably from this.

When we consider the rate of motion and size of these bodies, which is such that it takes the first 3·7 minutes, the second 4·3, the third 8·7 and the fourth 9·8 to move over their own diameter, we see at a glance how very irregular the results of any observations for longitude dependent on their motion must be. Not only are the idiosynerasies of vision of the person observing, and the light-gathering power of the telescope, important factors in the result, but also the light-transmitting condition of the atmosphere and the altitude above the horizon of the bodies under observation. It may be added that the last two conditions are hardly ever similar on two or more different occasions, so that any given fraction of any one of the satellites which would be just visible with any given light-gathering power of glass might not be visible at all with the same glass under different atmospheric conditions or at a different altitude.

The most probable result cannot be reduced from my observations until after I have made a series of observations of lunar culminations on both limbs at Ottawa or elsewhere, which I purpose doing as soon as possible. This arises from the fact that all but one of my culminations observed at East Main were taken on the moon when waning, or on its second limb. This necessitates observations on both to determine my "personal equation," and enable me to apply it to my results at East Main.

At East Main I was only able to get one night's work with the zenith telescope for latitude, and in this night could only get three pairs of stars. This was owing to the fact that I had but one instrument which was provided with a movable micrometer thread parallel with the transit threads. To adapt this for use as a zenith telescope it was necessary to turn the system of threads 90° in the tube, so that the micrometer thread should be horizontal, and when the instrument was to be again used as a transit the operation had to be reversed. It being necessary each time to make a careful adjustment for verticality or horizontality of threads, much time was lost.

As all possible culminations and occultations had to be observed, of course the eye end had to be kept in transit form as long as the phases of the moon rendered it possible to observe her, so that only for a few days about new moon in September could the telescope be kept in zenith telescope form, and during this time the weather was so unfavourable that only night work with it could be done, and this was much reduced by the limit of motion of the micrometer wire, the range of which was only about 25 minutes of arc, and consequently few pairs of stars were available.

The values deduced from the three pairs stand :—

1st	52°	14′	44·99″
2nd	52°	14′	45·17″
3rd	52°	14′	44·58″
Mean	52°	14′	44·91″

Owing to the position of the level on this instrument when used as a zenith telescope it is very difficult to read the bubble as accurately as would be desirable. I would respectfully suggest that an alteration be made in its construction to overcome this defect. For the same reason, it is very difficult to set the bubble to the mean zenith distance of the pairs of stars, and this defect causes great annoyance and contributes largely to discordance in results.

The longitude deduced from the culmination, so far as computed, is 5h. 13m. 57 sec. in time, or 78° 29′ 15″ in arc, west of Greenwich; but, as before stated, this is not the final value, which may differ from this several seconds of time. It is, however, near enough to the true value to warrant us in assuming that the inter-provin-

cial boundary between Ontario and Quebec, when produced north, will strike James Bay considerably west of its eastern shore, as will be seen from the following statement :—

Approximate longitude of observatory at Ottawa in time: 5h. 02m. 50·7 sec.; in arc, 75° 42′ 40·5″.

Mattawa, west of Ottawa, approximately, in time: 0h. 11m. 59·17 sec.; in arc, 2° 59′ 47·5″.

Inter-provincial boundary, west of Mattawa, approximately, in time: 0h. 2m. 26·00 sec.; in arc, 0° 36′ 30·00″.

Resulting longitude of interprovincial boundary, approximately:

5h. 17m. 15·87 secs.. .....in arc	79°	18′	58″
East Main, approximately.....	78°	29′	15″
Difference.....	0°	49′	43″

The inter-provincial boundary, then, is this amount west of East Main. This in miles is nearly 36, and as the observatory at the latter point is about 3 miles east of the shore line of the bay, the meridian of the inter-provincial boundary passes up the bay about 33 miles west of the mouth of East Main River. Rupert's House, which may be said to be at the extreme south-east angle of James Bay, is about 8½ miles west of East Main, or about 27½ miles east of the boundary meridian.

OTHER OBSERVATIONS.

Being provided with a dip circle for the determination of the magnetic inclination, total force and declination, I observed with it wherever practically possible. I am sorry to say, however, that was only in three places—Moose, Rupert's House and East Main. At Moose, owing to the almost continuous rainy weather, I could only get one set, but at each of the other two places I got two sets. I have not yet worked these out, but the results will be given in my final returns.

Between Lake Temiscamingue and Moose my time was too short, the weather too unfavourable, and the flies too numerous and vigorous, to think of taking a set of observations which requires one's closest attention for upwards of two hours without intermission.

From meridian altitudes of stars and sun, observed at Abitibi with a small prismatic transit in June, I deduced the following latitude by three observations, viz. :—

1st	48°	39′	32″
2nd.....	48°	39′	26″
3rd.....	48°	39′	40″
Mean.....	48°	39′	32·7″

The longitude due to chronometer differences of time between this point and East Main is 79° 12′ west of Greenwich; but it must be recollected that this cannot be considered very reliable on account of my not knowing the chronometer's rate between the two points, together with the uncertainty in the deduced longitude of East Main.

Latitude observations were obtained at Moose with the same instrument as that used at Abitibi, on three different occasions, which stood as follows :—

1st.....	51°	15′	01″
2nd.....	51°	14′	29″
3rd	51°	14′	38″
Mean	51°	14′	42·7″

The first result was obtained when the sky was covered with fleecy clouds, which made the body under observation appear very dim, so that the mean of the other two values is probably nearer the truth.

The longitude of Moose resulting from the difference of time between there and East Main is 80° 35′ west of Greenwich; but this is subject to nearly the same uncertainty as the longitude given above for Abitibi, and from the same causes.

Latitude observations were obtained at Rupert's House in the same manner as above, which place it in 51° 29′ 27″, and the chronometer referred to East Main places it in 78° 45′ west longitude; but when the most probable longitude is finally determined for East Main I shall be able, from the connection between those two places by the survey already described, to locate Rupert's House independently of the chronometer.

DESCRIPTION OF THE ROUTE FROM MATTAWA TO EAST MAIN.

Although nearly all the route travelled over is situated in the Provinces of Ontario and Quebec, and a part of it at least is only a few hours journey from Ottawa, it appears to me that a general description of it and some remarks on its difficulties will be of use, if for nothing else, at least to help any one who may have to go over the same route. I know such a description would have been of great assistance to me.

Between Mattawa, on the line of the Canadian Pacific Railway, and the foot of Lake Temiscamingue (about thirty-five miles) the Lake Temiscamingue Colonization Railway Company have a line of boats and a railway. The railway was built in order to pass rapids in the river, and is in four parts; the first, about four miles above Mattawa, somewhat less than half a mile in length; the second, about eight and a half miles from Mattawa, about half a mile long; the third, about twelve miles from Mattawa, and about one-fourth of a mile long. Over these three sections the cars are drawn by horses. The fourth section is between the head of Seven League Lake (which is simply an expansion of the Ottawa River) and the foot of Lake Temiscamingue, and is six miles long. Over this the cars are drawn by a small locomotive engine. From the end of this road steamboats take us without a break to the head of Lake Temiscamingue. On this lake there are half a dozen or more steamboats, of which two are of good size. The time from Mattawa to the head of Lake Temiscamingue, utilizing these means of transport, is two days: one to the foot of Lake Temiscamingue, the next to the head.

The scenery is beautiful, and, were it more generally known, I think many would make a holiday trip over this route, and find it as pleasant as any in Canada.

As far up as Fort Temiscamingue this lake is seldom more than a mile wide; but above that point from two to five miles. In the lower (narrow) part it is said to be very deep. The banks are very steep and high on this part, but on the upper end not so much so.

We leave the head of the lake by a part of the Ottawa River, locally known as the Quinze River, from the fact that fifteen portages have to be made on it to get to the lake at its head, known as Quinze Lake.

All this is avoided now by a waggon road from Baie de Père, on Lake Temiscamingue, to a bay on Quinze Lake. The length of this road is said to be about twenty miles. I was unable to get my canoes and all my supplies through by this route, and had to go by the Quinze River. This caused two and a half days of very heavy work.

A few notes on this part of the journey will not be out of place.

The first portage going up the river is on the south side, and about 120 yards long; the second, on the same side, about 250 yards long; the third, on the north side, about half a mile long, and over some rough ground. These three are all within sight of each other. Above the third there are about three miles of slack current to the fourth portage, which is on the north side of the river, and more than two miles long. In the ordinary height of water this is broken into three shorter ones by crossing the river, but my guides thought the current too strong and the water too rough to do this with my canoes. About a mile above this the fifth portage occurs on the north side of the river; it is only 100 yards long, but is over a sharp hill. Two hundred yards or so above this is the sixth portage, on the

north side of an island; it is about 150 yards long. In coming down stream, with medium height of water, both of these can be safely run past in ordinary canoes. Three-fourths of a mile above this is the seventh portage, on the south side of the river. It is over a very rough, rocky surface, and leads us from the river to a small lake, over which we sail about half a mile to another portage, over rough, rocky ground to the river again. The first of those is about 300 yards long, the other about 400, but in high water the latter is reduced about half. These two portages cut off a sharp bend in the river, in which there is said to be some very rough water. A mile or so of easy water in the river brings us to the ninth portage we made. It is on the north side of the river, is upwards of 1,000 yards long, and passes over rough ground. In low water this is cut into two or three by crossing the river.

The next portage is also on the north side, is 650 yards long, and on tolerably good ground. There are about three fourths of a mile between it and the last. A mile or so above this, on the north side, is the eleventh and last portage we had to make on this part of the river. It is 450 yards long and is on level ground.

A mile above this puts us into Quinze Lake, up the north arm of which we go on a nearly north course about thirteen miles. The upper three or four miles is shallow. We leave this lake by a small river, called Rivière Barrier, of an average width of 100 to 150 yards, and a slack current, up which we go about 2¾ miles to a portage 300 yards long, which passes a series of shallow, rocky rapids. At the head of this portage we enter Lac Barrier, up which we go on a course nearly north-west about fifteen miles to the mouth of a small river, called Lonely River, on the west side of the lake. This is the first stream of any noticeable size entering on this side. Beyond it there is a large island in the lake, which has the appearance of being the end of the lake. Just past this island the lake narrows, and then bifurcates—one arm running nearly west, the other nearly east. The westerly arm extends about six miles, and I do not know how far the other reaches. This lake is in no place that I saw much more than a mile wide. Its lower end is shallow and weedy.

The route follows Lonely River, up which we go about eight miles to Long Lake. The river is about 100 yards in average width, and has a moderate current. At one point it is only 2½ to 3 feet deep for a distance of 100 yards, but all the rest seemed to be upwards of five feet deep in low water. It is serpentine in its course, and the distance between the two lakes (Lake Barrier and Long Lake) I would not estimate at more than five miles in a direct line.

The arm of Long Lake, which we enter from Lonely River, is about a mile wide, 2½ long, and is generally shallow and weedy. The course up it is a little south of west. The main body of the lake where this arm joins it lies nearly north-west and south-east. South-east it extends six or eight miles, and is surrounded by high, rocky hills. North-west we go about 3¼ miles to a narrow part of the lake, about 60 yards wide and 100 long, in which there is quite a stiff current during high water.

These narrows continue for more than a mile, when the lake again widens. About ten miles above the narrows a deep bay extends from the south-westerly shore for several miles in a south-westerly direction. Looking down this bay, many high hills can be seen. Prominent among these is one named "Shew-me-ness," which is said to be the highest hill in that part of the country; its top is bare of timber. I was told the natives formerly (and to some extent still) considered it a holy hill, and it was customary for their medicine men to occasionally retire to its summit to fast and meditate. Two miles and a half or so past this bay, on the south-westerly shore, and soon after passing a couple of small rocky islands, we reach the mouth of a creek. Here there is a portage of about 300 yards to a small lake nearly a mile long and one fourth wide. A sail over this south-westerly to its extremity brings us to the east end of the height of land portage, over which we go in a westerly direction about half a mile to a small lake, the waters of which flow by the Abitibi River northwards to James Bay. In high water it flows both to the Abitibi and Ottawa, and it is said the channel giving vent to the Ottawa is yearly growing deeper. This will be spoken of at greater length later.

We cross this lake in a north-westerly direction about 1¼ miles, and leave it by a small crooked creek, known as Snake Creek, which passes through a grassy marsh. This creek is upwards of a mile long, but in a straight line it cannot be more than one-fourth of that distance from the last mentioned lake (or what we may call Summit Lake), to a very irregularly shaped lake called Island Lake, from the large number of islands it contains. Through this lake we pass nearly due north about eight miles, passing numberless and beautiful islands which are ever presenting new aspects of beauty, and revealing views of the distant hills around the lake, which, though not grand, are serenely beautiful.

Here we enter a deep, narrow bay, which trends eastward, and on about a mile and a half further we enter the river which discharges the water of the lake. Down this for about a mile we come to a portage to pass a rapid in the stream. This rapid is about 140 yards long, with a fall of six feet or so. Three hundred yards below this again there is a third rapid and portage 170 yards long, with a fall of seven or eight feet; about 300 yards below this there is another rapid and portage 170 yards long, with a fall of ten feet. These three places are known as the "Three Carrying Places."

Below this the course of the river is a little east of north, and somewhat serpentine, for a distance of about seven miles, at the end of which is another rapid and portage 40 yards long, with a fall of about five feet in low water, but hardly any fall in high water. Below this, for about 3½ miles, the course is about north-east and serpentine. In this twelve miles of river the current is nowhere swift (except in the rapids).

Here we enter a lake called Upper Lake, and keeping close to the west shore we pass between some rock islands and enter a deep bay extending southward. We cross this on a north-westerly course about 1½ miles, then continue along the westerly shore about half a mile, when we cross the mouth of another deep bay on a nearly north-west course about two miles to the northerly shore of the lake. Skirting the shore a little over half a mile we enter a small stream, which in a few yards expands into a small lake, and running along the west shore of this we find an outlet to the river, of which there are several channels which, however, unite just below here.

Upper Lake is very irregularly shaped; islands are as numerous in it as in Island Lake, and the scenery as beautiful. These lakes will compare for beauty with any places I have ever seen; and I feel confident, were they easily accessible, they would soon become places of resort in the tourist season.

About 2½ miles from this lake, in a generally north-easterly direction, there is a cataract in the river, and a portage of 40 yards to pass it. Here the stream narrows from 200 yards and upwards to less than a tenth of that, and falls through an opening resembling a gateway, in a ridge of granitic rock, a height of about twelve feet. Below this the course of the river is nearly north for 5 miles to Lake Abitibi, and from the mouth of the river to the Hudson's Bay Company's trading post on the lake is about 2¾ miles in a north-easterly direction.

The post is situated on a long flat point projecting into the lake, at its extreme east end. Formerly all the supplies for this post were brought from Moose up the Abitibi River, but for some years past they have been taken from Mattawa over the route I have just described, which considerably reduces the labour and expense of furnishing the post.

LAKE ABITIBI.

Like all the other lakes along the route, this lake is very irregularly shaped. It varies in width from a couple of miles to fourteen or fifteen. There are many large bays and numerous islands, most of which are rocky and many of them of considerable extent.

The route generally travelled from the post down the lake lies along the south shore for about 17½ miles, and then crosses to a point on the north shore on a nearly west course. The distance on this course is about 3½ miles, but the lake here is only a couple of miles wide.

Skirting the south shore for a distance of nearly five miles we reach the "Narrows," which are about two miles long, and in parts not more than 300 yards wide. At the west end of the "Narrows" a large island makes two channels of exit—the one to the north avoids a portage across a long peninsula, which projects from the south shore many miles northward. By this route, however, there is a large expanse of open water to be crossed, which in windy weather becomes too rough for ordinary canoes, and thus causes much delay. The south channel passes through a bay with numerous islands in it, which afford such shelter that it can be crossed almost at any time. The course is generally between south-west and west for about 5½ miles, when we reach the peninsula already mentioned. At this point we make a portage of about one fifth of a mile on a westerly course to a small lake about 300 yards across, from which another portage of about 150 yards brings us again to Lake Abitibi. Here we can in moderate winds cross straight to the head of Abitibi River, which, as seen from the portage, is just south of a small rocky island about two miles out, and nearly due west. The distance across is about 5½ or 6 miles. In windy weather, with a southerly or westerly wind, we can skirt the south and west shore of the lake to the same point, but with a northerly or north-westerly wind the water is too rough for an ordinary canoe.

ABITIBI RIVER.

At its head this river averages about 150 yards wide, with a moderate current. For the first five miles it runs generally south-westerly to the first portage, which is on the south side, and we pass a fall and rapids. The fall I should say is about twenty-eight feet high, and the total difference of level thirty-five feet. The portage is about a quarter of a mile long, and is not rough.

The course of the river is now for some distance nearly west. About two miles below the first fall there is a swift rush through a very narrow passage in a ridge of rock. Here the water is rough, but can be safely run in a good-sized canoe. Beyond this the water is smooth, with an easy current for about ten miles to a short rapid, easily run; then there is a mile of smooth water, and then about a mile of swift, rough water, which only requires watchfulness in keeping off the rocks to be safely run in any canoe.

About a mile below this a considerable stream comes in on the north side. My guide told me it was called "Mis-ta-ago Sipi," but he had not command of enough English to tell me what it meant, nor did I afterwards learn. Two miles or so below this there is a small rapid, easy of descent, and about 4¼ miles further a fall of four or five feet, and a portage on the south side 100 yards long. Two hundred yards below this there is another fall of seven or eight feet, and a portage on the south side also about 100 yards long. For about the next four miles the river runs between south and south-west to a river which enters from the south. I understood the guide to say that this stream has its head near the Rivière Blanche, which flows into Lake Temiscamingue close to the Quinze River, and that Indians sometimes go through to Lake Temiscamingue that way. This stream is 60 to 70 yards wide at the mouth.

Here the river turns to a northerly direction, and about five miles from the last stream we come to a fall of about fourteen feet, which I understand is called "Iroquois Falls." It is said it derived this name from an adventure of some Iroquois Indians many years ago, who were raiding the country, and compelled two native women to act as their guides. The women, to save their own people, lulled the suspicions of the raiders when they heard the noise of the fall, by assuring them that the noise they heard was caused by the entrance of an affluent stream over a high fall, believing which they went on to their destruction.

Another version of this story which I heard was that the enforced guides were men who assured their captors that the rapids could be easily run by keeping in a certain part of the channel, and to prove their sincerity took the lead in a canoe, but so acted that all their enemies went over the falls, while they, from their local knowledge, were able to escape.

The first version seems to be a stock story, and is told of several other cataracts; and to speak for myself, I do not think either version very probable, as Indians, as a rule, are not apt to run much risk, certainly not in a strange country.

The portage past this is on the south side, and is about 140 yards long.

The course of the river is serpentine, and ranges from about north-west to north-east, and about 9½ miles below Iroquois Falls we come to a rapid half a mile or so in length, with a fall of four or five feet. The only danger in this is from rocks, of which there are many, and it requires a sharp lookout to avoid a collision with them, especially in low water. The general direction of the river below this rapid is a little west of north, and the current is smooth and easy for about 18½ miles, when there is a small ripple 40 or 50 yards long. After passing this the general direction is the same for nearly seven miles, when it turns sharply to the west, and we immediately enter the Long Sault Rapids. The first three miles of this is only a very swift current, which ends at a barrier of granitic rock, through a narrow opening in which the river tumbles down about seven feet. The portage here is about 40 yards long, and is on the south side. Below this there is about three eighths of a mile of rough water, with very large rocks in it, when the water again takes a plunge of about five feet. The portage here is on the south side, and is 100 yards in length. This is succeeded by over half a mile of bad rapids, rough and stony. I camped at the head of this part in the evening, and in the morning found that my guide had deserted me, though for what other reason than inherent ugliness I cannot say. To search for him would only entail loss of time without any benefit, so I made an examination of the rapid from the shore, and ran down it without mishap other than taking a little water into the canoes.

Below this for two or three miles there is swift and shallow but not dangerous water. In all this rapid I would estimate a fall of about 40 feet.

In the bad part of this rapid the course of the river turns from west to generally north, and continues so for about 7½ miles, when it again turns sharply to the south-west. Just at the turn a stream 50 to 60 yards wide enters on the north side. As my guide was gone I could not learn anything concerning it. About 5½ miles from this stream there is a short rapid, midway in which is an island. Fair sized canoes can safely descend this rapid, but there is a portage on the island about 60 yards long. Continuing on a south-westerly course about 3¾ miles brings us to the next rapid and portage. The portage is on the southerly shore, and is 100 yards long. Like several of the falls already mentioned, this one is only a contraction of the river by a ridge of granite rock, the water-way through it being only one sixth or one eighth of the average width of the river. The fall is only about three feet, but it is much too rough for any canoe to pass through.

The river here begins to change from its south-westerly direction and gradually curves around to a course nearly north. About a mile below this rapid a river quite as large as the Abitibi joins it from the south. It is known as Frederick House River, and is said to have its source in a lake not far from the head of Montreal River, which flows into Lake Temiscamingue.

The course of the river from here down for about eighteen or nineteen miles is a little west of north, when it again takes a short turn to the west and passes through another granite ridge, forming two very bad rapids. To pass these there are two portages on the north side of the river—the first 170 yards long, the second 190. The fall in the first is about ten feet, in the second four or five; between them there is a pond about 200 yards across. After passing these the course is again northerly, and for a mile or two the current is smooth and easy, but after that the presence of many granitic islands in the river renders it swift, but not rough. About two miles of this bring us to another rapid, where again the course changes from northerly to westerly, and we pass through a granite ridge. The first portage is on the westerly shore, about 100 yards long, and over level ground. The next is across an island in the river, and is about 100 yards long, and is known as the Island Portage. The distance between them is 50 or 60 yards. I ran past the first one in my canoe. It is easy to run down, but somewhat difficult to stop at the island before you are swept

into the next rapid, which would quickly engulf a canoe. The fall in this rapid is seven or eight feet. The course of the river is again northerly; the current is very easy, and the width about 200 yards. About fourteen miles from Island Portage a small river joins from the west, known as Red Whitefish River. Three miles further down, the river again turns westerly, and passes over a succession of rapids, of which I got the following description from an employé of the Hudson's Bay Company: Two miles below the turn is the first rapid, which is a very bad one. The portage past it is on the easterly side of the river, is about half a mile in length, with level, good roadway, and is called the Lobstick Portage. The next one is a little more than half a mile below this on the westerly side of the river, and is known as the Burnt Wood Portage. It is about 300 yards long and over a very rough, rocky surface. The rapids are very bad. This is succeeded by about a mile of calm water to the next portage, on the westerly shore, about 100 yards long, and over a rock. It is only 100 yards again to another portage, which is on the easterly side, to avoid what is called the Clay Falls. It is along the face of a clay slope, and is close to the water's edge in high water; it is about 200 yards long. Next comes the Birch Portage, about 100 yards below the Clay Falls. It is on the easterly side of the river, about 300 yards long, and over good ground. Close to this is the Oil Portage on the same side, also over good ground.

In high water it is dangerous to cross from the Lobstick to the Burnt Wood, and on this account another route is often travelled. This is known as the Little Lakes Road. It leaves the river on the east side just where the river turns westerly, and 300 or 400 yards above a large rock standing on the east side of the river, close to where a small creek enters. Once the end of it is found there is no trouble in following it, as it is a well beaten pathway. First there is a portage upwards of a mile and a half to a small lake, about 600 yards across; then a portage of about 400 yards to another lake, 700 yards or so across, in a westerly direction, where the next portage is about 400 yards long, but as it is very crooked it might easily be shortened to about half that. The next lake is only about 200 yards wide. It is crossed in a north-westerly direction to another portage, 700 yards long, to a pond 250 yards across, at the extreme westerly end of which we find a portage 2,700 yards, or a mile and a half long, which brings us again to the river 100 yards or so below the Oil Portage. This last portage is the greater part of its length in the valley of a creek, and is very rough and difficult to travel over.

The aggregate distance portaged over on this way is upwards of 8,000 yards, or nearly five miles; while by the river route it is only about 2,000 yards, or less than a mile and a quarter. Notwithstanding this, the lake route is much travelled—I suppose because most of the canoes in the vicinity are small, and five miles of hard travel and a certainty of life at the end are pleasanter than one and a quarter without that certainty.

Below the Oil Portage there is a pond-like expanse in the river before it plunges down the cañon. This is a veritable cañon, being not more than 20 to 30 yards wide, with perpendicular banks, generally much higher than the channel is wide. It is upwards of two miles in length, and, as I only saw the end of it, I cannot say much in description of it. I was informed that parts of it cannot be seen from the bank, owing to their height and steepness, and as no one would care to pass through it simply to possess the privilege of describing it, it is likely to remain unpictured for some time. As scenery it is grand and impressive when viewed from either end. The portage past it is on the east side, and is over two miles long and somewhat difficult, on account of four or five bad hills on it. Below the cañon there is another pond-like expanse in the river, which is succeeded by a rapid 400 or 500 yards long, and safe enough for ordinary canoes to run, but requiring alertness at the foot, as it is shallow and stony. The current is now smooth and easy; course between north and north-east for six miles, which brings us to the Hudson's Bay Company's trading post on this river, named New Post.

From New Post, down for about sixteen miles, the Abitibi preserves a generally uniform width (150 yards), with smooth, easy current, and general direction a little

west of north, when its navigability is again interrupted by a succession of rapids, which necessitate a portage (on the east side) of fully two miles, with two bad hills at the north end. This portage is sometimes divided into two (one about a mile, the other less than a quarter), but it does not appear that the difference is considered of much advantage.

About a mile below this portage is another, also on the east side, 900 yards long. The rapid here is not very rough, and can be run in light canoes, but mine were too heavily laden. Below this portage there is about a quarter of a mile of swift rough water to run before we get into smooth water again, which, however, only continues about two miles, when there is another portage, also on the east side, and about 900 yards long. Parties going up sometimes ascend this and the preceding rapid in their canoes by keeping in shore and poling. Nearly all the Indians in this district are adepts in poling, and two or three of them will take a canoe up a rapid that the uninitiated would hardly think it possible to ascend without the aid of a line. On one occasion a small Indian, named Samson, whom I considered only a boy from his size and appearance, asked my two men who were with him in my largest canoe to get out at the foot of a rapid about 200 yards long. They not knowing what he wanted did as he requested, when he immediately got into the stern, pushed out and poled up the rapid apparently with ease, though the current at the place could not have been less than ten miles per hour and the water four feet deep. So quickly did he handle his pole that one could hardly see him lift it and take a fresh stroke, and so true did he keep the canoe to her course that she never swerved an inch from it. Had she done so she would have turned and gone broadside down again. At the same time and place *five* other men in a birch bark canoe had to make two attempts before they succeeded in getting up, while two Indians in my other canoe exhausted themselves trying to get up, but did not succeed, and we had to haul them up with a line from the shore. Samson afterwards carried one of the canoes on his shoulders over a two mile portage. It weighed over 170 lbs., and considering its bulk this was quite a feat. I learned that his father was famed for his portaging abilities, and so injured himself in trying to place on record the heaviest load over a portage that he died from the effects of it. It is said that the load he carried was 960 lbs. for a distance of one stage (about 400 yards).

Their poles are eight to ten feet long, stout enough to be rigid, and, whenever possible, pointed with iron; otherwise they soon become bruised, and will not hold on a stony bottom.

Five miles below the last mentioned rapid we come to the head of a long rapid, in which the river widens to about 600 yards, or about three times its average width, and is correspondingly shallow. This rapid is not very rough, but is somewhat dangerous, by reason of its shallowness and the numerous rocks in it. The first part is about three miles long, after which it gets smooth, but is still swift and shallow for about 2½ miles, when it again becomes a rapid resembling the upper part, and continues so for about 3½ miles. This rapid is sometimes called Long Rapid, but oftener the "Pudding," from the resemblance some islands standing in it bear to a plum pudding. In this rapid the course of the river is about north, but below it it swerves a little eastward.

A river called by the Indians "Abitibi Shi-sipi," or "Little Abitibi River," flows in from the east about four miles below this. It is upwards of 100 yards wide at the mouth, but is shallow. Continuing the same course about seven miles brings us to a shallow rapid of no especial importance, called Blacksmith's Rapids. One party told me it was so named because a drunken blacksmith was drowned here some years ago, but others gave as the origin of the name the existence of a bed of lignite coal here, which latter derivation I suppose to be the true one.

About a mile below this a river enters from the east, 20 yards or so wide; and about 2½ miles from this another river, about 40 yards wide at the mouth, enters from the west. My guide called it "O-nak-o-whan-i-Sipi," but could not, owing to his ignorance of English, tell me what that meant. About a mile below this, what appeared to be a small river was seen on the east side.

The general course of the river here is nearly north-east for many miles back; but its character changes, in that there are now numerous islands in it, and it is wider and often shallow, with some swift currents in the shallow places. The same course and character continue for about 29 miles below O-nak-o-whan-i-Sipi, when it spreads into three or four branches and passes down shallow rapids to the Moose, or, as the Indians there call it, the "Mi-tag-ami" River. One of these branches can be run in canoes when the water is high enough, but in low water it is too shallow for an ordinary canoe. I passed down the westerly shore, the water barely floating the canoe, though it only drew ten or eleven inches. This continues for nearly a mile, when just above a rocky point, which throws the water outwards and makes a bad swell (and on account of rocks a passage can hardly be made anywhere else), there is a portage of about 500 yards. Below this there are still about 300 yards of rapid, which must to be descended carefully and slowly on account of shallowness and rocks. Just below this we enter Moose River.

MOOSE RIVER.

From its confluence with the Abitibi the course of this stream is about north-east. It is about a mile wide, and is, as a rule, shallow. The greater part of the channel, for some miles near and below the Abitibi, is not more than two to four feet deep, with many gravel bars, and two or three small rapids.

From the mouth of the Abitibi to Moose Factory, the Hudson's Bay Company's trading post, is about twenty miles. A history of this place would hardly serve any useful purpose in a report such as this, and I will only remark that the post has been in existence about two centuries, and has been for many years and is now the port of entry for the whole of James Bay district.

Here the company has several good buildings, a good garden and potato field. A meteorological record is kept by one of the company's officers for the Meteorological Service of the Dominion. The company also has a small portable saw mill here, made by Waterous, of Brantford, Ontario. This manufactures all the lumber required by the company here, and some for the other posts on the bay. Here, also, is the episcopal see of the Church Missionary Society's diocese of Moosenee.

The ship which brings out the company's supplies for the district sails to within nine miles of the factory once every year, arriving in the latter part of August, and departing as soon thereafter as she can be unloaded. This generally takes about three weeks, and is performed by two small schooners and a sloop the company keeps here. One of these afterwards distributes the supplies to the various posts around the bay. Further on I shall make some remarks on the navigability of the bay by large vessels.

Moose is situated on the east side of an island, the surface of which rises about twenty feet above high tide. The top soil is generally a mixture of silt and vegetable mould. The island is about half a mile in width and about two miles long. Owing to its position, the many islands in the river here, and the fact that the deep water is in the westerly channel, strangers would very likely pass on to the bay without noticing the factory. To write down a description of the route to be followed would be somewhat tedious. The only way to do it comprehensively would be by courses and distances, which I am not in a position to give exactly.

It is said the channel on the easterly side of the islands, although shallow, will float a canoe well enough, and by that route it would hardly be possible to pass the factory without seeing it. From the easterly side of Moose Island to the east shore of the river, at right angles to the general course, is 81 chains (1,782 yards), but in this distance there are two extensive sand bars. Between Moose Island and the westerly shore there are several islands, and the westerly channel, exclusive of them, appears to me to be as wide as that east of Moose Island; so altogether, the river here must be considerably over two miles from shore to shore.

The easterly, or South Channel, as it is locally termed, is the one by which all the traffic is carried on.

From Moose Factory to where the shore line of James Bay turns sharply eastward is 12½ miles. This part of the river is between two and three miles wide, with many timbered islands and sand bars.

JAMES BAY.

The course of the shore of James Bay from the above point is about east south-east for sixteen or seventeen miles to a point which I take to be the westerly limit of Hannah Bay, but as I had no guide with me here, and saw no one near who could define the limits of the bay to me, I am not sure, as there is very little difference in the trend of the shore line between the mouths of Moose River and Hannah Bay River. If this point is the westerly limit of the bay it is about twenty miles along its south-western shore to the mouth of Hannah Bay River, and if its westerly limit is the next point eastward its south-western shore is only about eleven miles long. In referring to these places as "points" the word is, as generally accepted, somewhat misapplied, as there is no point, but only a difference of a few degrees (the greatest about seven degrees) in the direction of the shore, taking its general outline for some distance each way.

From the mouth of Hannah Bay River the shore is nearly due north for about three miles. It then changes a little to the east for about four miles, to the mouth of a river, the Indian name of which as given to me by an intelligent Indian who has travelled around the bay a great deal (being the company's dog teamster), is Mis-ish-shi-koope or Big Skunk Man River, though why it was called this he could not tell me. From here to East Point (about ten miles) the course is about north. This is called the north-eastern limit of Hannah Bay. From this point the shore trends more and more to the east as we advance, until at Point Comfort (about thirty-three miles from East Point) it turns south-east.

I have tied Point Comfort to my micrometer survey on the east side of Rupert's Bay by astronomical azimuths from several stations, by which it can be connected with my astronomical station at East Main, and thus it can be accurately located.

East of Point Comfort there is an extensive bay, known as Cabbage Willows Bay, so called, it is said, from the resemblance which bunches of willows on its shores bear to heads of cabbage. It is called by the Indians "Is-to-a-cow," or soft mud holes, from the marshy nature of its shores.

The winter trail from Rupert's House to Moose passes this way, and overland to another bay called Gull Bay, which makes the distance much shorter than that by canoes. Cabbage Willows Bay is about 4½ miles across at the mouth, at the east side of which is Black Bear Point. From here, if it is not too windy and rough, canoes can cross straight to Rupert's House; if it is, they have to coast around Rupert's Bay. The distance between Moose and Rupert's House by the shore is about 120 miles, but this may be lessened ten or twelve miles if it is calm enough to cross the bays instead of keeping inshore. Nearly all this distance the water is so shallow near shore that, though it may be windy and rough outside, the waves are broken and lost in the shallows, and a canoe can proceed in the shallow water without difficulty.

Rupert's House is situated on Rupert's River, less than a mile above where it expands into the bay. From it all the trading outfits for the company's posts around the waters of Nottaway, Rupert's and East Main Rivers are distributed.

From the mouth of Rupert's River the shore line southward is nearly due south for a distance, I should estimate, of not less than ten miles; but, as I did not go to the bottom of the bay, this is only a guess based on the appearance of the timber seen there. Northwards from the mouth of the river, the general trend of the shore is about 20° west of north for a distance of about twenty-seven or twenty-eight miles. It then turns sharply to the east, and the course to the mouth of East Main River is about 30° east of north.

CHARACTER OF THE SURFACE AND AGRICULTURAL CAPABILITIES ALONG THE ROUTE.

From Mattawa to Fort Temiscamingue the surface is all rocky and hilly, with a few slopes and flats of cultivable soil interspersed on the hill sides and in the valleys.

Above this point the surface is more level and less rocky. Around the head of Lake Temiscamingue and Quinze Lake the greater part of the soil, as seen from the lake, could be cultivated. At present there are quite a few farmers on both sides of Lake Temiscamingue who have come in from the earlier settled parts of Ontario and Quebec, and most of them declare themselves satisfied with their venture, and state positively that they are not visited by summer frosts, and that as good wheat can be grown there as in the settled parts of the Provinces.

On Quinze Lake there are a couple of farms which are cultivated by lumber firms for the benefit of their shanties in the vicinity, on which are raised potatoes, hay and oats. They appear to be fairly successful with these crops, but as there are no grist mills anywhere in the vicinity no attempt is made to grow wheat in quantity. Along Barrier River, Lake Barrier, Lonely River and the southerly end of Long Lake, the surface, though not level, is not rough, and the quality of the soil along the shore, as seen and evidenced by the growth of timber, is fairly good. The surface about the middle and the upper end of Long Lake is rocky and hilly and only a small proportion of the soil is fit for cultivation. The surface around the watershed is generally hilly and rocky, but there are many parcels of fairly flat surface, and soil good enough for farming purposes. Around Island and Upper Lakes the above description applies, as it does pretty well to the country between them. Between Upper Lake and Lake Abitibi, and especially around the latter, the surface soil is generally good enough to admit of a large percentage of it being classed as fair farming land.

The Hudson's Bay Company have a garden attached to their post at Lake Abitibi, in which are grown all the potatoes and garden stuff used by the officers there. The potatoes compare well, both in quality and size, with those grown in the country around Ottawa; yet the quality of the soil is not favourable to the development of that tuber, being a white clay, impervious to moisture, and very hard when dry. No attempt is made to grow grain here, as no use could be made of it, and whether the season would permit its full development is questionable.

The ice becomes pretty thick on the lake, and remains on it rather late in the spring, as will be seen from the following extract from the company's journal at the post:—

1887—Lake clear of ice 6th May. Planted potatoes 21st May; took them up 24th September. First sign of ice on the lake 23rd October; lake closed 25th October.

1888—Lake nearly clear of ice 27th April; ice gone and navigation open 15th May. Planted potatoes 5th June; harvested them 1st October. Thin ice on lake 11th October; lake closed 21st October.

1889—Ice beginning to break up 19th April; lake and river quite free 6th May. Commenced farming operations 6th June. Planted potatoes 12th June; harvested potatoes 23rd September. First ice visible 21st October; lake closed 22nd October.

1890—Ice became unsafe 23rd April. Still plenty of ice in lake, but navigation open 15th May. Planted potatoes and sowed turnip seed 14th June. Harvested potatoes 25th September; harvested turnips 21st October; quality good, but quantity small owing to cut worm.

The presence of such a large mass of ice and cold water so late in the spring must assuredly have a detrimental effect on vegetation, and must go far to neutralize the benefit of the same body of water in the summer when it is warm.

The country all around this post is described as swampy, with many small lakes, so that very probably there is no part of it in which the spring would be any earlier, and consequently this may be considered a fair test of the agricultural worth of this section. The potatoes and garden vegetables I saw there were of fair size and good quality; yet I would not advise anyone to seek a home there—at least, for some time to come.

Along the Abitibi River the country, judging from what can be seen from the river, is not rough enough to interfere seriously with cultivation. The soil along the river is fair, but on the uplands it appears to be sandy wherever I had occasion

to inspect it there. The valley is not deep until we approach New Post, where we often see terraced hills rising upwards of 100 feet above the water. The soil on these hills is generally a sandy or gravelly loam. At New Post the company have, on the first terrace above the river, several garden patches, in which they grow what vegetables they require, and of very fair quality, the potatoes being good and of medium size. Of the other garden stuff grown there, not very much could be said that would be favourable. The uplands around here were described to me as swampy, with many ponds interspersed and some sandy ridges; and this agrees pretty well with the appearance of the Little Lakes portage route already described.

The officer at present in charge of the post has only been there a little over a year, and his experience is too short to warrant him in saying anything definite about the agricultural value of the district. He was good enough to permit me to make the following extracts from the journal kept at that place. The post has been in existence since 1867, and I went over the whole of the period since then; but going, say, twelve years back will give as good a general idea as a longer period, so I will begin with 1878.

1878—River here clear of ice 20th April; first snow 18th October; river set 11th December.

1879—River clear of ice 2nd May; first snow 18th October; river set 1st December.

1880—River clear 8th May; first snow 12th November; river set 22nd November.

1881—River clear of ice 30th April; first snow 15th October; river set 5th December.

1882—River clear 11th May; first snow 30th October; river set 3rd December.

1883—River clear 12th May; first snow 1st November; river set 16th November.

1884—River clear (date not stated, but appears to have been about 1st May); first snow 18th October; river set 7th December.

1885—River clear 4th May; first snow 20th October; river set 24th November.

1886—River clear 20th April; first snow 15th October; river set (not stated).

1887—River clear 3rd May; first snow 24th October; river set (not stated).

1888—River clear 11th May; first snow 19th October; river set 20th November.

1889—River clear 27th April; first snow 23rd October; river set 16th November.

1890—River clear 9th May.

I passed New Post on 20th October, and the temperature of the water was 46°. I may here state that the temperature of the river water was taken every day up to Lake Abitibi, where, on the 28th October, it was 42°; but that day and night a strong cold north-west wind blew, which lowered it to 39° in twenty-four hours, and at Abitibi post it was the same on the morning of the 30th. In Upper and Island Lakes it was from 44° to 46°, according to the depth of the water. In the little lake at the summit it was 45°, although quite a lot of snow had fallen during the day. The first snow-fall I saw during the time I was in the field was 11th October (the day I left Moose), and the weather all the way to Mattawa was continuously rainy with occasional showers of snow. The temperature of the lakes this side of the watershed was from 44° to 48° between the 1st and 18th November—the latter temperature being in the deep part of Lake Temiscamingue, which generally does not freeze up until late in December.

Between New Post and Moose the surface gets more even and less elevated above the river as we approach the bay, until, on Moose River, the banks are very low, and continue so to Moose.

Along the bay, between Moose and Rupert's House, the surface rises only a few feet above high tide, with the exception of what appears to be a sandy ridge south of Black Bear Point, locally known as the "High Lands," which rises probably 100 feet above the bay. The soil is all more or less sandy, and the timber, except near the mouths of rivers, is stunted and small. Between Rupert's House and East Main the first twenty miles is generally the same in character as between Rupert's House and Moose; beyond this the shore presents a radically different appear-

ance, being rocky, with many knolls and hills, and many rocky islands in the bay. The shore line is also very irregular. One of the hills, "Sherrick's Mount," rises to about 600 feet, and is the most prominent hill that I saw around the bay. This height was deduced from its elevation above the horizon, as measured from a station of the survey. Looking inland from near it several other hills are seen eastward and north-eastward from it, but none apparently of as great altitude. What the origin of the name was I could not learn. It was supposed by some that a shark was once seen or found dead near it, and the name as pronounced is almost identical with shark, as pronounced by an Orkney man, and most of the servants and many of the officers of the company are natives of the Orkneys. This explanation is not generally accepted, and is probably incorrect.

At Moose and Rupert's House, as at the other posts I visited, the company have gardens, in which all the potatoes required are grown. Garden stuff is also grown to a considerable extent, but such things as melons, tomatoes, cucumbers, &c., will not ripen, even with considerable forcing. Last season the tomatoes at Moose got no nearer ripening than to colour slightly. Currants, both black and red, are grown at both places, and are good, both in size and quality; and wild strawberries, raspberries and gooseberries are to be found all along the coast, as far as East Main, to my knowledge. But they ripen much later than in Ontario, the strawberries not being ripe last season until the latter end of August and the gooseberries a week or two later. Blueberries are plentiful all along the coast, more especially at East Main.

It appears attempts have been made at Moose to raise grain, but with indifferent success. At East Main potatoes and some garden stuff are grown. The potatoes are fair, both in quality and size, the other stuff, principally onions, being small. Pease were planted there in June, and had just blossomed a few days before I left (3rd October). During my stay there there was no frost, but a north or north-west wind so lowered the temperature that the thermometer ran down to 45° or 40°, and of course during the continuance of that temperature vegetation is almost at a stand-still—and there are altogether too many days of that kind.

If I am to accept my experience of last season as a fair criterion of summer weather on the bay, I should say, from my knowledge of the North-West Territories, that this region is, climatically speaking, only equal to places fully 10° farther north in latitude in the North-West, and therefore we cannot look forward to any great agricultural development here.

Cattle.—At all the posts around the bay quite a number of cattle are kept, and all that I saw were of such size and appearance as would be creditable anywhere. East Main post is kept up exclusively for raising cattle, no trading being done there. Cattle and sheep are raised there and distributed to the other posts, either as beef and mutton or as milch and stock cattle. About fifty head of cattle are kept permanently there, and about the same number of sheep. The cattle are very fair in quality, the milch cows giving a fair yield and looking well, though the only pasture they had was on the open, grassy spots along the coast. The grass is coarse and rank, but is (if the appearance of these animals is any indication) as nourishing and fattening as the much finer grasses of the more southerly parts of our country. The sheep, owing to a long term of inbreeding, have deteriorated into a small-bodied, large-headed and heavy-horned animal, very different from the higher grades of sheep we are accustomed to see. They are quite wild, and very active, and roam for miles around the post; yet there has been no loss from beasts of prey, as far as known to the officer at present in charge of the post, who has been there since 1872.

The hay for the subsistence of the cattle at all the posts is cut in meadows along the coast, most of which are submerged at high tide. The meadows from which the supplies for Moose are obtained are about seven miles down the river. The hay is cut between tides, loaded into boats to the extent of about five or six tons each boat, brought up to the post, and there cured and stacked.

The same process is observed at Rupert's House, but the distance it is necessary to ship it is much less. At East Main the greater part of the hay is cut on an

extensive meadow four miles south of the post, and cured and stacked there, and brought in during the winter on ox sleds. The stacks have to be erected on staging, to prevent their being flooded in very high tides. There are many meadows around the bay which could be utilized in the same way, and doubtless there are many other places on the streams flowing into the bay which would serve the same purpose equally well. It is futile for any one to think of embarking in this enterprise at the present time, but the fact of its possibility is worth recording.

TIMBER RESOURCES.

It is needless to say anything of the timber resources of the Upper Ottawa, they being well-known, but the country near the watershed we are not so familiar with. Here, there is much red and white pine, with some fair spruce available, which will compare well in size and quality with a great deal that is now taken out. Timber on Barrier Lake, Lonely River and Long Lake, and its affluent streams, can be directly floated into the Ottawa. That beyond the watershed, around Island Lake and its affluents, can with very little trouble be floated into the waters of the Ottawa as follows: I have already mentioned that in high water the water from Summit Lake flows both to the Ottawa and Abitibi. Now it appears to me that a few hundred dollars judiciously applied would make this exit to the Ottawa available for the passage of timber through it and down to Long Lake. By deepening and straightening Snake Creek, which could be easily done, and placing a tug (such as is now on Quinze Lake), on Summit and Island Lakes, all the timber around there could readily be placed at this exit, and thence easily brought to the Ottawa, by the aid of a tug on Long Lake, Lonely River and Lake Barrier. As we approach Lake Abitibi the pine gradually thins out, until six miles below it, on Abitibi River, the last white pine is seen, and thenceforward we have only spruce, poplar and some birch and tamarack, of which only the first named is large enough to be of any commercial value, and only a small percentage of that is large enough for lumber, in the common acceptation of the term. On Moose River there are many spruce trees fifteen inches and upwards in diameter, and some balsam and poplar which could be utilized for many purposes. Very few trees were seen around James Bay of large enough size for other use than fuel. In the vicinity of Rupert's House some building timber might be found, but not much suitable for any other purpose; and the same remark applies to East Main, and all the intervening country.

If the timber on all the other rivers flowing into the bay is no more important than that I saw on the Abitibi I would hesitate to call the timber resources of that district valuable; for though it is all thickly wooded, only a small percentage of it (along the river at least) is large enough for merchantable lumber. Yet the time is coming when it will have to be resorted to, and when this time comes we shall find ample water power on the ground for the cheap manufacturing of all the available lumber there, so that the consumer here or elsewhere will not be burdened with the cost of transport of the refuse part of it.

MINERALS.

All the rock seen on the route from Lake Temiscamingue to the foot of the long portage below New Post was granitic. A noticeable fact in connection with the rock exposures along Abitibi River is that very seldom is rock seen *in situ*, except at the rapids and falls, and at nearly all such the course of the river is deflected at right angles to its general course, the rock ridges lying about north and south. The river might be called a succession of rapids and pools, there being very little current between the successive ridges.

At the second rapid below New Post the rock is a very soft, friable sandstone, of coarse texture and massive stratification. Just below this, on the east bank of the river, it is not so massive, and is coloured red, and appears to be somewhat mixed with clay. In the next rapid the same kind of grey sandstone is exposed; and in the Long Rapids the rock exposed on the west side is a sandy shale, with, near the foot, a black clay shale, which would lead one to suppose from its appearance that

lignite might be found not far off. The rock on the east side I did not see closely, but it appeared to consist of stratified argillaceous sand mixed with coarse gravel, which presents the appearance which gives rise to the name of the Pudding Rapids. Below this at a few points, noticeably at Blacksmith's Rapids, there are small exposures of black shale. At the rapids at the mouth of Abitibi River the rock is a thinly stratified limestone. Along the shore of the bay no fixed rock was seen, until after passing Rupert's House about fifteen miles, when granite rock is the predominant feature of the surface.

Economic Minerals.—Nothing was seen of economic value, with the exception of some lignite of very poor quality on the westerly side of the river. I dug out a few small specimens of this, and brought them away with me, and have handed them over to the Geological Museum. The exposure is so covered with clay and shale that I could not, without more time and labour than were at my command, determine the dimensions of the seam. I saw quite a large specimen of this lignite at Moose, which an Indian had procured for some one there. It was said he found it at the water's edge at very low water. It was of much better quality than any I saw, but was not hard enough to stand transport any great distance. I was told that the Indians have reported seeing some similar stuff near the mouth of the Little Abitibi. When coming up I kept a look out for this, but saw no indication of it, except it be in a scarped clay bank, a short distance up that river. It is said to be visible in very low water. I saw some other exposures of clay shale, which seemed to me to indicate the proximity of lignite, notably about the middle of Pudding Rapid.

When at Abitibi Post the officer in charge informed me that some Indians had reported to him the existence of coal some distance east of that place. From the character of the rock around I doubted the truth of the report, and asked him to try and procure a specimen. During the summer he did so, but found that it was only some hard black rock, which the Indians thought was coal.

I neither saw nor heard of any other minerals of probable economic value, except a very fine reddish-grey granite, which occurs in massive beds, and out of which stone of almost any dimensions could be cut. It appears to me it could be made to look quite as well as much that is now used for monuments and ornamental purposes. It is known as the "Red Rock," and is on the east coast of the bay, about midway between Rupert's House and East Main. As it was not my business to search for mineral wealth, other than what might lie in my way, it is not unlikely that some valuable deposits may exist along the route.

I was informed by one of the company's employés who spent some time at Ungava that a nugget of gold was picked up near the mouth of that river. I have not much faith in the statement as I heard it, but will say it is probable, from the general character of the geology of the region along the head of the river that gold may be found in it.*

OTHER RESOURCES.

Fur.—It might be said fur is the only resource of the district around the bay, as, with the exception of the feathers and down of wild fowl, the value of which is comparatively small, it is the only one utilized.

The pelts collected consist principally of beaver, marten, otter, lynx, fox, mink, black bear, and a few wolf and white bear. The Hudson's Bay Company practically collect all the furs in the district, as the very few collected by the traders who occasionally venture down to the bay are hardly worth excepting. The total value of the trade, of course, varies with the good or bad conditions of the seasons, and what its total value was in any particular year I did not learn.

* Since writing the above I have had a conversation with Mr. Low, of the Geological Survey, who informed me that as far as known at present the character of the rocks around the head of Ungava River would not warrant the assumption that gold might be found in the waters of that stream. Mr. Low was in the vicinity of the head of this stream and found only Laurentian rocks, which, so far as known, have not furnished gold in noticeable quantities. He is not prepared to say that there is not gold-bearing rock on the head of that river, but thinks it somewhat improbable.

Fish.—Fish are not plentiful in the bay, nor are those I saw of good quality or size. Although many nets were set at Rupert's House, and between there and East Main, and also at the latter point, I did not see a fish that would weigh more than 3 or 4 lbs. Pike, pickerel, whitefish, trout and a small species of sucker are the only kinds I saw caught, with the exception of one very small sturgeon, at the mouth of Pontax Creek.

The largest fish (using the word in the popular sense) which frequents the bay in any numbers is the white porpoise. It visits the southern part of the bay in June, immediately after the ice breaks up, but does not remain long, moving northward or out into deep water in July. During my stay at East Main three of them came up the river past that post. Their milky-white colour makes a beautiful contrast with the dark water, and as they range from ten or twelve to eighteen feet or more in length, they are easily discernible when they rise to blow. Many years ago the Hudson's Bay Company brought out the necessary appliances to extract the oil from their blubber, and established works at Great Whale River, where the animals used to resort in great numbers; but the returns do not seem to have ever amounted to much, and the project was very soon abandoned.

Seals frequent the south end of the bay, but apparently not in such numbers as to justify one in counting them an asset to the credit of the district.

From all I could learn, and I made enquiries of all whom I thought likely to know anything of the matter, it does not appear to me that the value of the fisheries (in James Bay at least) can be held out as an inducement for communication with the district. Of course if Hudson's Bay should prove valuable in this respect, the question of traversing James Bay southward to the terminus of a railway would not be a very serious one for light-draught vessels; but I heard nothing that would justify me in assuming that Hudson's Bay was specially rich as a fishing ground whatever a thorough examination might reveal.

As in the north-west part of our Territories, the fish in the inland lakes constitute the staple food of the natives while on their hunts.

Myriads of wild fowl visit the bay in the spring and fall (principally ducks and geese), and great numbers of them are killed, and salted in barrels for future use. It is said to be no uncommon thing for some of the natives and old residents of the country to kill as many as a hundred in a day; but I can assure the uninitiated that they might spend several days there and not kill one; and were they dependent on their guns for their living they would often be likely to go hungry, until they had learned much from the natives of the habits of their game.

It is reported that vast herds of cariboo wander in the interior, near the head waters of Ungava River.

RIVERS FLOWING INTO THE BAY.

None of the rivers flowing into the bay from the Moose to the East Main, inclusive of these two, are important as a means of navigation. None of them will admit a deep-draught vessel. Six miles below Moose, on Moose River, the Horse Shoe bar will not permit the passage of the company's schooner "Mink," drawing about eight feet of water, except with high tide, and the tide in the south end of the bay is such a variable quantity, depending largely on the direction and force of the wind, that she is not certain of a passage even then. When I was at Moose she started for Fort George, on the east coast of the bay, but owing to a strong southerly wind reducing the rise of the tide she was stranded on this bar, and remained there for two days, until the wind changed and allowed the tide to resume its normal height. The ship which brings the company's supplies out from England draws, when loaded, about seventeen feet of water, and she has to govern her movements by the tide to pass over bars, and get to "Ship Hole," about nine miles from Moose Factory, where she anchors in about eighteen feet at low water, and waits until she is unloaded. Here she is not liable to be disturbed much by heavy swells, but there is not much protection from winds. The schooner can come up the south channel of Moose River

a short distance past the factory, but cannot, except with very high tide, get close to it. Every fall she is lightened, brought close to the bank and hauled up for the winter, and launched again in the spring.

The tide runs up this river to the first small rapid, about seven miles above the factory. The ordinary tide rises about six feet at Moose, but a strong north wind blowing for some time makes it much more than this, and a strong south wind reduces the height considerably.

Between Moose River and Hannah Bay River only two unimportant streams enter, both of them within a few miles east of Moose River. The larger of them, commonly known as West River, flows out of quite a large lake, called Sagima Lake, which is said to lie twenty-five to thirty miles south from Moose.

Hannah Bay River (or, as the Indians call it, Wa-sha-how Sipi, or "River in the Bay") is quite a large river at its mouth. An island divides it into two channels, each of them being upwards of 400 yards wide. I sounded it in the northerly channel at low tide and found only eight feet of water, and the depth appeared to diminish as we got seaward. The company had a trading post here for a long time, but owing to trouble with the natives many years ago it was abandoned.

I was told at Abitibi that some of the Indians of that district sometimes cross the watershed from a stream flowing into Sagima Lake to the head of this river, and descend it to the bay in their hunt for fur. Like all the other rivers flowing into the bay, it is merely a succession of rapids.

Between Hannah Bay River and East Point two unimportant streams empty. Between East Point and Cabbage Willow's Bay only a few small creeks enter. Into the latter bay a small river called by the same name flows. On the west side of Rupert's Bay a small river enters. Nottaway River enters at the head of Rupert's Bay. I did not see it, but from description it is a series of shallow, though not very rough rapids, which can be descended without much risk; but it is so difficult to ascend that no attempt is made, and the supplies for the trading post on its head waters are sent up by Rupert's River, and an overland portage is made from one water system to the other. I was informed that this river takes its name from an Indian tradition that a hostile tribe called by that name occasionally came down it on a raiding expedition.

About midway between Nottaway and Rupert's Rivers a small river known as Fish River enters. It is called by the Indians Pa-kis-koo-na-ow Sipi, or "River where the swells come back," in reference to some peculiarity of tidal action there.

Rupert's River is about 500 yards wide at the post at low tide, but nearly a mile wide at high tide. The tide runs up this river only two or two and a half miles to the first rapids. This is one of the principal rivers of the bay, and although, like all the rest, it is a succession of rapids, it is used as the highway for the transport of outfits for the posts on the Nottaway, Rupert's and East Main, which are portaged from convenient points on it to the other water systems. Its ascent is very laborious and slow, but is considered easier than either of its neighbouring streams. As it has been travelled so much it is better known, and consequently better mapped than any of the other rivers flowing into the bay on the east coast. When I was at Rupert's House, all the Indians who are acquainted with the upper part of this river were away with the company's canoes, so I could not learn anything very definite of it or its branches, and will only repeat what is already well known: that it takes its rise in Lake Mistassini, which is fed by several comparatively large streams. From this lake there is a route to Lake St. John, Quebec. Outside the mouth of Rupert's River the channel is narrow and shallow, and has to be beaconed for four miles out. At one point there is a bar on which there is no more than four feet of water at low tide. The channel being narrow and somewhat crooked, a ship has to await a stern wind either to get in, or to get out when in. In this way it happens that the company's schooner has to lie at anchor outside for days, until she gets a favourable wind to get in, and very often meets with as long a delay before she can get out. Once over the bar she can sail close to the post, and discharge directly on the wharf.

Between Rupert's and East Main Rivers half a dozen small streams enter. One of the largest of these, Pontax Creek, called by the Indians May-ab-is-cow Sipi, or

the "River on the stones," because its mouth is very shallow and stony, is only about ten miles from Rupert's House. It appears, from accounts I got of it, to be much longer than one would expect from its proximity to Rupert's River.

At Rupert's House I got from an Indian who spoke good English and had travelled much along this coast the names of all these streams as known to the natives and their signification in English. At East Main I made inquiries to have this information corroborated, but found that only one or two of the streams had a common name at both places. I mention this to show the difficulty that often lies in the way of getting the native name of a place. The reason for this is, as is generally known, the fact that the native names are always given on account of some peculiarity of condition or position, as seen from a certain standpoint. Now, this peculiarity or condition is not the same from all standpoints, and it will thus have different names in different districts.

East Main River, called by the natives, as this Indian informed me, Kis-ta-chiwan Sipi, or Chief River, is, at the post 76·50 chains, or 1,683 yards wide. The tide runs up it to the first rapids, about fifteen miles above the post, and the white porpoises which come into the river go up as far as that, showing that there is a good depth of water all the way up. It appears this river was ascended in 1824 by a Mr. Clouston, under orders from the Hudson's Bay Company. He made a map of it, a copy of which Mr. A. P. Low, of the Geological Survey, obtained at Little Whale River. This is now in the office of the Geological Survey, but I have not yet seen it. The journals of this post were removed many years ago to Whale River, and the greater portion of them burned, so that source of information (a very valuable one) was not available. It appears that this was quite an important place at one time, as the ship from England called here. It used to anchor in the mouth of the river on the north side and close to a large island. The channel then used was described to me as somewhat crooked and narrow but deep, and it is said to be still deep enough for ordinary vessels. The company's schooner attempted to come in here a few years ago, but ran aground and did not succeed; but those in the vicinity, who profess to and ought to know, say she was not kept in the channel, or she would have had no trouble in getting up close to the post. No trading is done at this post, and very few Indians frequent the river, especially the lower part, for the reason I have already mentioned—that the post on its head waters is supplied *viâ* Rupert's River. It appears only one family of Indians have been frequenting its vicinity to hunt, and, not having a very good reputation among the Indians, they were not much associated with. All the members of this family, except a boy, died in the winter of 1888–89. This boy was at East Main when I was there. As I was informed he had been up and down the river for a distance of about 150 miles since his childhood, I got him to make a sketch of the course of the river, as far as he knew it, and give me what information he could about it, which I accomplished by the aid of the family of Mr. Corston, in charge of the post, who all speak Indian better than English, and are thoroughly acquainted with all the natives around, and their habits and peculiarities.

This boy said the general course of the river was about the same as at the post (east and west) for about seventy miles, to where a branch joins it from the north-east. The southerly branch is the main one. Above the forks, the course going up is south-eastward for twenty or twenty-five miles, when it changes, and continues north-eastward, as far as he was up it, but it appeared to him to change from there more to the southward. There it is quite a large stream, and he recollects many Indians speaking of it as coming from far inland near a large lake, out of which the waters flowed the other way to a big water (the sea), but what direction he did not know; and even his recollection of this information is vague and uncertain. However, Mr. Clouston's map will be much more definite than any native's recollection of it.*

* Since writing the above I have, through the kindness of Mr. Low, of the Geological Survey, obtained for inspection a copy of Mr. Clouston's map. It cannot be claimed for it that it is very comprehensive or detailed in its information. He only maps the river to the neighbourhood of Lake Mistassini, and, further than marking its general course, gives no information at all. One would infer from his map that he has devoted all his attention to Rupert's River and almost ignored East Main River.

According to his account there are six rapids below the forks, the first four of which can be poled up, or safely run down in an ordinary canoe. The next two, in ascending order, are just below the forks, and, from his statement, appear to be two cataracts joined by a swift, rough current. There is a portage past them on the south side about 2¾ miles long, or, as he explained it, about as far as from the post to an island at the mouth of the river.

Above the forks there are thirteen rapids, as far as he went, only one of which can be run down in a canoe; and the 9th to the 12th, inclusive, can be poled or hauled up, but at all the others portages must be made. The 4th and 5th above the forks are falls, the 4th about 20 feet and the 5th about 40 feet high; both are passed by short portages. None of the portages, except the last above the forks, are long. The last one is on the south side, and about a mile long. Of the others, the first three above the forks are on the north side of the river. The others he was uncertain about, but said it would not be hard to find them as there were good pathways at all of them.

It is probable that this post will be abandoned in the near future, as it does not appear to pay running expenses, though a good price is allowed for all the cattle transferred to other posts, and 34 cents per pound for all butter sent out; but the fact is, nearly all the other posts on the bay raise all the cattle required for their own use.

Here there is an old grave yard, in which are two grey sandstones, finely finished —one erected to the memory of William Boland, who died 8th August, 1804, aged 47 years; the other to the memory of George Gladman, who departed this life 9th August, 1821. It is worthy of note that a great grandson of the latter gentleman was a member of my party.

Of the other rivers north of this, I got a little information from the gentleman in charge of East Main (Mr. Corston), who has been in the country since 1836, and has travelled much round the bay since that time; but as Mr. A. P. Low, of the Geological Survey, has examined several of these rivers, and his account is already published in the report of that survey for the years 1887-88, I will not further refer to them.

While at East Main I was told that the Rev. Mr. Peck, a missionary at Fort George, had ascended Fort George River, as it is called by the people there, but which Mr. Low calls Big River, and crossed from it to the head of the Ungava, which he descended to Ungava Bay. My informants were not very well acquainted with his account of the journey, but gave me the following items: The journey from James Bay to Ungava Bay occupied only twenty-six days. There was nothing specially difficult about it, the portage from one water system to the other being estimated to be about ten miles, partly over a rough, rocky ridge. The descent of the Ungava River was easy, requiring no portaging at all. The country around the head of the Ungava is treeless, and covered with furze and moss, over which numberless cariboo wandered, apparently heedless of the presence of man. I tried to get from Mr. Peck himself a few notes of this journey, but failed to communicate with him in time to get them before I left East Main. I hope to get his reply by the next mail from that district.

HARBOURS.

In view of the possibility of early railway communication with James Bay, the question of harbour accommodation is a prominent one. Of the three points I saw—Moose, Rupert's House and East Main, it appears to me that Moose is the most advantageous. It is certain that ships drawing seventeen feet of water can get to within nine miles of the factory, and by cutting a channel through the Horse Shoe Bar they could come far enough up to have good shelter, and be convenient to a railway terminus. If this were not done the railway would probably have to go down the easterly shore of the river, and pass over a low, flat shore, which is flooded at high tide, quite a distance to get opposite to Ship Hole, and from the shore a roadway would have to be built out to the latter, and suitable dockage made for the ships. This would entail more bridge work or filling than the trade done would warrant,

at least for some time to come; but whether or not it would be more expensive than channelling the Horse Shoe Bar and part of the river is a question which can be decided only by a proper survey. If it were required to admit modern steamers of twenty feet and more draught, I understand the outer part of the channel would also require deepening in places.

Under existing conditions there is nothing to prevent the building of a good solid roadway to below Horse Shoe Bar, and the transfer from there of the cargoes by barges and tugs. The wind and waves would often interfere with this arrangement, but it might with a small outlay meet all requirements for many years to come, as it has served the Hudson's Bay Company's needs, apparently without any serious hindrance from this cause, for a long period. This suiting all present purposes, harbour accommodation could be developed in time as trade required it. One contigency which would have to be provided for is the extraordinary rise of the tides, caused by a long continued strong north wind. This, of course, the railway engineers could guard against in building their road.

Hannah Bay being so shallow that even at high tide it is almost dry, it is useless to speak of harbour accommodation there.

To enter Rupert's River, upwards of four miles of channel would have to be deepened and widened, and provision would have to be made that it would not refill, which otherwise it probably would do in a short time, as the current and silt from three rivers sweep down Rupert's Bay across it, and are met by the incoming tides with considerable force, just about where this channel is. This, in addition to the extra length of railway, would probably cost so much that, as compared with Moose, it is out of the question, as the cost of the extra length of railway would go a considerable way towards making a fair harbour at Moose.

The same objection applies with still greater force to East Main; and besides, it appears to me that the entrance to the mouth of the river through the shoals in the bay would require considerable improvement to meet the requirements of modern shipping, as well as the mouth of the river itself. Unless some rich mineral vein should be discovered in the vicinity of either of these places to create a traffic, there is no inducement to think of either of them as a possible harbour in preference to Moose.

It is probable a better harbour could be found at the mouth of Big River, but as this is about 140 miles north of East Main, to get there would entail many miles of extra railway. Assuming the railway to start from Mattawa, an air line to Moose is about 360 miles. From the same point to the mouth of Big River (Fort George) is about 500 miles.

From Sault Ste. Marie to Moose in an air line is about 380 miles, and to Fort George about 570. This last distance is measured across the bay; the line round it would probably be 100 miles longer.

NATIVES.

All the natives of the country speak the same language, Cree, which is spoken from Temiscamingue to Fort George, which latter is about on the dividing line between the Indians and Esquimaux. A larger percentage of the Indians speak English than in any other part of our country in which I have been, and many of them understand a good deal of it who could not be induced to speak a word.

Missionaries have been labouring among them for nearly a century, and have succeeded in attaching them to some church—most of them to the Episcopal, which has mission stations at all the posts on the bay, except East Main. During a part of the year the missionaries hold school, and teach the children to read and write in their own language. Every Sunday, service is held for them, and the church service is gone through. The church has printed the service and hymns in the Cree language, and a large part of the Bible is now translated, and all will be in the course of a few years, and distributed among them as may be deemed necessary.

Notwithstanding the length of time they have been under training, a good deal of their original superstition still clings to them. One unpleasant feature of this is the dread they have of anyone who becomes mentally deranged. They seem to

think they are possessed of an evil spirit, and there are instances where, when they have been beyond civilized influence, they have put an end to the existence of such unfortunates. Whether such derangement was a form of lunacy, or due to the transient disturbance of fever, made no difference to them. I heard accounts of several deaths caused by this superstition. The means resorted to is generally strangling, but sometimes more horrible ways are tried.

It will probably take generations and a long course of careful training to eliminate from the character of the native such groundless fears, which much retard his advancement and increase his dependence on his white brother.

In conclusion, I desire to express my gratitude to the officers and servants of the Hudson's Bay Company, whose kindness and attention at the posts I called at were all that could be wished for.

I regret that I could not accomplish more than I did; but as I have mentioned some of the adverse circumstances I had to contend against, I hope, sir, you will give me credit for what I tried to do and failed in, as much as for what I succeeded in accomplishing.

I have the honour to be, Sir,
Your obedient servant,
WILLIAM OGILVIE,
Dominion Land Surveyor.