HB Rest

With compliments of
J. W. Tyrrell

COAST AND HARBOUR SURVEYS

IN

HUDSON BAY AND STRAIT

BY

J. W. TYRRELL, C.E., P.L.S.

COAST AND HARBOUR SURVEYS

IN

HUDSON BAY AND STRAIT.

By

J. W. TYRRELL,

Civil Engineer, Provincial Land Surveyor.

TORONTO:

Printed by C. Blackett Robinson, 5 Jordan Street.

1890.

COAST AND HARBOUR SURVEYS IN HUDSON BAY AND STRAIT.

By J. W. TYRRELL, C E., P.L.S.

In this paper I propose briefly to present an account of the principal surveys performed, by the recent Hudson's Bay expedition—of which the writer was a member—sent out under the command of Lieutenant A. R. Gordon, by the Dominion Government during the years 1884, 1885 and 1886.

Before taking up my subject proper, however, I think it will be interesting just to note the names of some of the early explorers who visited in years gone by the field of our observations.

Hudson Strait was first discovered in the year 1517 by Sebastian Cabot, who was sent out by Henry VIII. in charge of an expedition to search for a north-west passage to India. In the year 1610 Henry Hudson sailed in a barque called the *Discovery*, and re-discovered the strait now called by his name, passed through it, keeping along the south shore, and entered the bay, in the southern part of which he wintered. The next summer, becoming short of provisions, he had trouble with his crew, who finally mutinied, and one night bound Hudson, his son and several of his officers, and sent them adrift in an open boat. At this time they were supposed to be near the west end of the strait. The remainder of the crew, after undergoing great privations, reached home with the ship; but nothing was ever afterwards heard of the unfortunate navigator and his party.

In the year 1821 Captains Parry—afterwards Sir William E. Parry—and Lyon, in command of H.M. ships *Fury* and *Hecla*, conducted an expedition into Hudson Strait and Bay, and obtained some valuable information in the neighbourhood of the upper Savage Islands and elsewhere; and three years later Captain Lyon, in command of H.M. S. *Gripper*, again visited the same waters.

In 1836 and '37 Captain G. Back, in command of H.M.S. *Terror*, also made a voyage of discovery into Hudson Strait and Bay, and since the year 1847, when the ill-fated Franklin expedition was lost, several other exploring parties have gone to that region, but few of their searches extended into the fields of our labours.

However, notwithstanding all these expeditions (besides the annual voyages of the Hudson Bay Company's ships, which have for several centuries visited the shores of Hudson Strait and Bay) it was found a short time ago, when the question of the practicability of navigating Hudson Strait became a matter of discussion, that very little reliable information of any value was available, and in order to thoroughly look into the feasibility of the proposition to establish a steamboat route between the Eastern world and our Canadian Northwest, the Dominion Government thought it well to send out an expedition to collect such information as might be required to determine the question.

Accordingly, in 1884 the steamer *Neptune*, and in 1885 and '86 the *Alert*, having been procured for the work, Lieutenant Gordon, R.N., under instructions from the Honourable Minister of Marine, proceeded to Hudson Strait to establish observing stations, and to collect as much valuable information as possible.

Naturally, surveying formed an important part of the work of the expedition, as it was very desirable to know something of the character of the coast, and to locate and survey harbours wherever they might be useful.

I have here a small map of Hudson Strait and Bay on which I have shown in red the portions of coast line added to the chart from our surveys.

The principal places where work was done are as follows:—First, at the entrance to the strait north of Cape Chidly, the Buttons, a group of eleven or twelve islands were surveyed. This work was done from the deck of the ship as she was steaming slowly past the islands, upon the extremities of which rounds of compass bearings were taken at intervals. As each round of bearings were taken, the reading of the patent log was also noted, and the distances passed through the water by the ship, as indicated by the log, were used as bases. As these islands are situated not far from the cape, their positions relatively to it were determined by the same means, and near the cape on the main land a series of observations were taken both to determine the latitude and longitude. A snug little harbour which was called Port Burwell was also discovered just inside the cape, and a sketch survey made of it and soundings taken. A prolonged attempt was made to discover a harbour along the coast of Resolution Island, which forms the northern limit of the great gateway into the interior of our country, but nothing in the shape of an inlet or bay fitted to afford protection and an anchorage for a ship could be found. The whole coast presents an unbroken front of solid rock, and towards the interior of the island attains elevations of about one thousand feet.

On the south shore of the strait, near Cape Prince of Wales, a fairly good harbour was discovered and called Stupart Bay, after the first observer who was stationed there. Series of observations were taken at this place to determine its geographical position; the instruments used for the observations being two Hadley sextants and six chronometers, whose rates were compared daily with a standard. Then, from Stupart Bay as a starting point, the writer with a small

party was sent out in one of the ship's whale-boats to make a track survey of the coast toward the south-east.

This was accomplished, and about twenty miles of hitherto unknown coast-line added with a fair degree of accuracy to the chart, besides forty more determined approximately by ship's bearings upon prominent points.

Considerable difficulty was met with in carrying on this survey, for the compass, which is very sluggish in all this region, was found in some places to be of no use whatever on account of the occurrence of great masses of magnetite. As the only instruments furnished me for making the survey were a boat's compass and patent log, it seemed to me at first difficult to know how to proceed, but by adopting the principle of table surveying from points on the shore when the compass was unreliable, I managed to get along fairly well. Wherever the compass worked satisfactorily, bearings were taken from point to point along the shore, and the distance measured with the log.

It is worth noting just here that, at a point about ten miles south of Stupart Bay, four small iron cannon (one of which may now be seen in this hall) and a large anchor were discovered by Mr. Payne, who was the observer situated at Stupart Bay. They were lying upon the rocks, and some distance above high water mark. As appears evident from the cannon now on exhibition here they must have been lying there a great number of years.

There were no signs of buildings or other wreckage about, and it is a matter of some curiosity to know where they came from; but I must not get too far from my subject. On the shore of Big Island, near the north shore of the straits and directly opposite Stupart's Bay, a large harbour was discovered and named Ashe Inlet, after Mr. Ashe, D.L.S., of Quebec, who was the observer placed in charge of a station at this point the first year of the expedition. Considerable track surveying was done at this place, during the winter of 1885-86, by the writer.

Proceeding westward we come to Charles Island, which, as shown on the chart, we found to be considerably out of place in longitude. Observations were taken to correct its position, and, as we steamed along the north shore, bearings were taken to determine the general shape of the coast line. The next place in order as we proceed westward, where considerable work was done, is in the vicinity of the Digs Islands and Cape Wolstenholm. Here again, in the more westerly of the Digs Islands, an excellent harbour was found and christened Port Laperrier.

The position of this port was also carefully determined, and the track surveys which were afterwards made in the vicinity were tied on to this fixed point. At one time, while Lieut. Gordon was taking a series of observations, Doctor Bell, the scientist of the expedition, and the writer, were sent out in a boat with two or three men to make a traverse, or perhaps more properly called a running or track survey of the islands. The shooting in this neighbourhood we had reason to believe was very fair, but the instructions we received were not to

take our rifles, as we would have no time for sport. One of the party, however, disobeyed the commander's orders, and, along with the rest of our outfit, smuggled aboard our boat his Remington rifle.

A boat's compass, a prismatic and a patent log, were, as usual, our surveying instruments, and we proceeded from point to point taking our bearings and measuring the distance in the usual way. When we had traversed a short distance—not more than two miles—along the north shore of the outer island, and were about to enter a little cove in the shore, our attention was diverted by the appearance, a few yards ahead of us, of two polars swimming in the water—a large she bear and her cub. They did not appear to take much notice of us until we got between them and the shore, hoping to cut off their escape by land. But things did not seem to work that way, for the old bear, seeing our move, headed for the boat and in a moment disappeared below the water.

Our rifleman had taken up his position at the bow of the boat, and the writer, having along with him a 38 cal. S. & W. revolver, took a position beside him and waited for the reappearance of the bear. Presently she appeared, but at the stern of the boat, where the doctor was seated steering, and immediately she proceeded to climb in. We in the bow dare not fire as two sailors and the doctor were standing in front of us; but some way or other, through the assistance of a pike pole and the motion of the boat—for besides it being under considerable headway, the water at the time was very rough—we managed to part with our new acquaintance. It was about here that the track surveying proper came in. Several parting shots were fired as the bears were swimming ashore, and afterwards as we saw them disappearing among the rocky hills, but on account of the roughness of the water and the tossing of our boat they were without effect. About fifteen minutes after leaving the site of the above encounter, we came upon two other large male bears, and had a hard fight with them, in which conflict, however, we were more successful. These little incidents, though not exactly coming under the head of surveying, were some of the difficulties we had to overcome, and so I consider it quite proper that they should be mentioned. If any of our friends here should have occasion to make surveys in the same district, it would be to their advantage to know what instruments would be found most suited to that particular locality.

The traverse of the coast was continued for about seven miles, when the eastern extremity of the outer island was reached, where a fine, deep, but narrow channel, was found to separate it from the inner island. The shores were chiefly high, and in some places were found perpendicular cliffs of rock standing up from five hundred to one thousand feet out of the water.

At these places thousands of sea-fowls were seen flying about and resting on the ledges along the face of the cliffs. The birds were not so numerous as to prevent us from getting clear sights from point to point; but just here our progress was again interfered with by the occurrence of local attraction in the shape of a herd of about thirty walrus. We did some clearing here, but nothing very extensive, and

then pushed on, passing the eastern end of the Island and then turning shipward along the south shore. The rest of our trip, extending over about five or six miles, was comparatively plain sailing, the only obstacles met with being one small herd of walrus and one more polar bear. In some respects this eighteen or twenty miles of coast survey was the most difficult that I have had to deal with in my experience.

Just to the south of the Digs Islands a group of twenty-five or thirty small islands were also surveyed, and the main shore for a distance of about twenty miles south-west of Cape Wolstenholm. Near the south-eastern extremity of Nottingham Island a harbour was discovered, and called Port De Boucherville in honour of the observer left in charge of the station placed there.

The positions of the eastern coast of Mansell Island and the southern end of Southampton Islands were corrected in longitude.

A portion of Marble Island, in the north-west of the bay, was surveyed, and its geographical position determined. Then, arriving at the west coast of the bay, it was found according to the chart to be half a degree out of position for about one hundred miles south of Cape Esquimo. The true position of this coast having been ascertained, we passed southward and arrived at Fort Churchill, a place, for various reasons, the most interesting yet spoken of in connection with our voyage. For over two hundred years it has been one of the most important trading posts of the Hudson Bay Company. More than that, it was their chief stronghold against invaders, being protected by the massive stone fort Prince of Wales until about the year 1775, when it was taken by the French admiral, La Pérouse, and destroyed. At the present time it is an important trading station, and possesses the only harbour on the west coast of Hudson Bay, and lastly it is destined to be the future terminus of the Hudson Bay railway, and the Liverpool of Manitoba and the North-west Territories.

I have here a chart of this very excellent harbour, prepared from an accurate survey made by Lieut. Gordon and myself. I will briefly describe the methods adopted in performing this work. The first step taken was to erect a number of signals or small beacons at prominent points on both sides of the river and at intervals of about half a mile. Then a level stretch of shore was chosen between two beacons (I and H on chart) and the distance carefully measured; this distance was used as a base line, and from the extremities of it sextant angles were taken to the other points (with the exception of one or two, which were fixed by taking angles from other more suitable points, which had been fixed by the other sites). The shore line was then traversed by the compass and fitted in between the points fixed by triangulation. Having now obtained a correct plan of the shore line, the next work was to get a plan of the bottom of the river. The difficulty we met with in performing this part of the work was, not to take the soundings, but to locate them correctly; for, on account of the ebb and flow of the tides and the currents of the river, it was impossible to keep any kind of a straight line with a boat. In getting over the difficulty our beacons came into use again. At every cast of the lead,

by the use of two sextants, double angles were taken simultaneously from the centre of the boat to some three beacons on the shore, one beacon always being common to the two angles. Thus every sounding was an absolute fix, and was plotted upon the chart by means of a station pointer. It was also necessary to note the time when each sounding was taken, in order to be able to make the proper reduction to low water, as at this place the rise and fall of the tide varies from eight to sixteen feet. As may be seen by this plan, the area of water in the harbour within a four-fathom line is approximately half a square mile, and with a very little dredging this area could be considerably increased.

The mouth of the Nelson River was also surveyed in a somewhat similar manner, but not so completely, on account of the much greater dimensions of the work—the river being fourteen miles wide at the mouth—our limited time, and the less necessity for the survey. Sufficient soundings were taken, however, to ascertain the limits of the channel of deepest water, and to give evidence of the impracticability of making a harbour at York. The *Alert* was obliged to anchor ten miles outside the mouth of the river altogether, where she was exposed to the full sweep of the gales from the north-west, and one night experienced such a heavy sea that it was found necessary to let oil tanks run to prevent the seas from breaking over her.

I had intended to give you an account of some track surveys made during the winter season by myself, when travelling about the country on a sled drawn by an Esquimo dog team; but am afraid that I have already taken up as much time and space as my subject will warrant me in doing.

PLAN
OF
CHURCHILL HARBOUR

By LIEUT. A. R. GORDON, R.N.
AND
J. W. TYRRELL, C.E.

Scale: 1 inch = 2,000 feet.

FEB., 1890. J. W. TYRRELL, P.L.S.