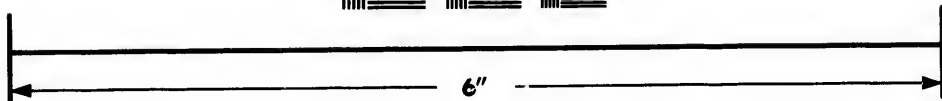
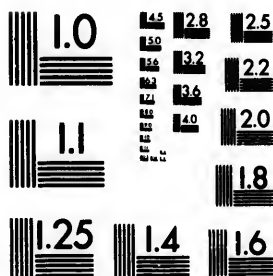


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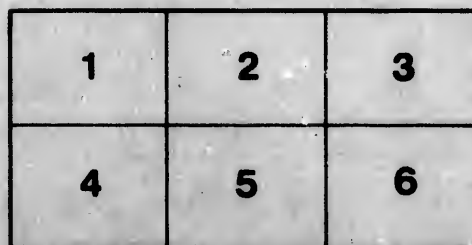
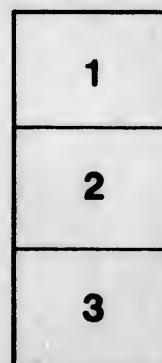
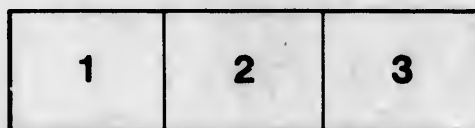
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The Waterways of the North-west.

(For the Manitoban.)

BY H. N. RUTTAN, C.E.

THE three chief rivers of North America, east of the Rocky mountains, are:

- (1) The Missis-ippi, drainage area 1,244,000 square miles.
- (2) The St. Lawrence, drainage area 510,000 square miles.
- (3) The Nelson, drainage area 480,000 square miles.

It is proposed at present to consider the two last named in connection with the facilities which they afford for the transportation of the surplus grain of the Northwest to the seaboard and to Europe.

Chicago may be taken as the principal head of navigation on the St. Lawrence and Winnipeg on the Nelson route.

The railway haul from the great wheat producing area of the continent, to Chicago, may be stated at 1,000 miles; and to Winnipeg at 200 miles.

The distance from Chicago to the head of ocean navigation at Montreal is 1,260 miles, and from Winnipeg to the head of ocean navigation at York is 660 miles.

Montreal is distance from Liverpool 3,225 miles and from York to Liverpool is 2,966 miles.

	Inland Navi- gation.	Ocean Navi- gation.	Total miles.
Chicago to Liverpool..	1,260	3,225	4,485
Winnipeg to Liverpool..	600	2,966	3,566

The total distance from the centre of the wheat area to Liverpool is: Via Chicago 5,485 miles; via Winnipeg 3,826 miles. The saving in distance by the Nelson route being 1,659 miles, made up as follows: Railway, 800 miles; inland navigation, 600 miles; ocean navigation, 259 miles; total, 1,659 miles.

In view of the above facts it is certainly worth while to look carefully into the practical questions affecting the navigation of the Nelson route, and if the difficulties are such as can be readily overcome, the early adoption of that route for the great bulk of the export and import trade of central North America is assured.

It is not considered necessary here to

answer the statement, that is always made when the Hudson's Bay route is mentioned, "That it is impossible to navigate Hudson's straits." It should, in the absence of any proof to the contrary, be sufficient that one of the most practical officers of the navy, Captain, now Admiral Markham, after a personal examination, has reported strongly in favor of the contention that the navigation of Hudson's straits is commercially practicable.

In Hudson's Bay, between the straits and the mouth of the Nelson, there are no difficulties as Dr. Bell says, in speaking of the bay, "It is open all the year round."

Lake Winnipeg, at the bottom of a basin which, during the glacial period, had its outlet to the south, now receives the drainage from an area extending from the head waters of the Mississippi and the height of land west of Lake Superior to the summit of the Rocky Mountains; and from the watershed of the Missouri to those of the Athabaska and Churchill Rivers. This immense drainage area of some 480,000 square miles, had its outlet through the Nelson River into Hudson's Bay.

A short distance to the east of the Nelson and close to it is the Hayes River. The Hayes rises about 28 miles from the Nelson at the outlet of Lake Winnipeg, and empties into Hudson's Bay six miles from the mouth of the Nelson. The Hayes drains a large district to the east and north of Lake Winnipeg.

The mouth of the Red River is, according to the Government maps, 710 feet above sea level.

Both the Nelson and the Hayes offer practicable routes to the sea from Lake Winnipeg.

Enough is known about the Nelson to make it certain that, by the improvement of the channel, construction of ship canals, or ship railways, ocean steamers may be brought into Lake Winnipeg and possibly into the mouth of the Red River. While there is not sufficient data to enable an estimate of the cost of the necessary work to be made, there appear to be fewer and less serious obstacles in the way than on the St. Lawrence route from Chicago.

The Hayes River offers an alternative route between Lake Winnipeg and Hudson's Bay. This is the old Hudson's Bay Co. boat route which has been used, as the chief avenue of the company's European trade, from the earliest times to the present day. From what is known of the Hayes, there appears to be no difficulty in the way of canalizing that river for inland boats of 9 feet draught.

The following summary of a description of the Hayes route is compiled from Dr. Bell's report, Geological survey of Canada, 1878.

Norway House to Echimamish, 28 miles, by Nelson River, which is about a mile wide and full of islands, shores low but not swampy. Sea River falls, a chute of about 4 feet occur at 17 miles from Norway House, boats run down.

Echimamish to Painted Stone, 25 miles. Two dams with a rise of about one foot each are passed in this interval. The Painted Stone forms the watershed of the channel, the water running both ways from it. It is 28 yards in width. Boats are hauled over it.

Painted Stone to Robinson Portage 18 miles. The White Water River joins the eastern Echimamish seven miles from Painted Stone. The Robinson Portage is 1,315 yards in length. The difference in level, between the upper and lower ends of this portage, is 45 feet.

Robinson portage to Wapinapis 34 miles. Two rapids occur between seven and fourteen miles from Robinson portage. Wapinapis portage is 24 yards in length. The river falls by a chute at this point six feet.

Oxford or Holey Lake, 30 miles. Oxford Lake to Knee Lake, 11 miles. Knee Lake, 40 miles.

Jack River, Knee to Swampy Lake, 10 miles. Jack River has considerable descent in the lower half of its length, the rapids being over ledges of Laurentian gneiss.

Swampy Lake, 10 miles. The last lake on the route. From Swampy Lake the river is called High River, as far as the junction of the Fox River, where it becomes the Steel River to its confluence with the Shamattawa, from which point to the sea it is called the Hayes River.

From Swampy Lake, 19 miles, the river flows through a labyrinth of islands. A great number of islands occur in this distance, all of which can be run by boats. Bed of river and islands mostly gneiss. At end of this stretch clay banks first make their appearance on both sides and continue all the way to the sea.

Labyrinth of islands to Brassy Hill, 5 miles.

Brassy Hill to the Rock, 13 miles. Several rapids and chutes over ledges of gneiss occur in this distance.

From the Rock to the sea no more rapids occur.

The Rock to Fox River, 39 miles.

Fox River to Shamattawa, 29 miles. Steel River, width about 3 chains. Clay banks average height of 70 feet.

Shamattawa River to York Factory, 50 miles.

Norway House to York Factory, 361 miles.

It is to be regretted that there is no data as to the volume of the Hayes; it is not likely, however, that there would be any difficulty in procuring the necessary quantity of water for lockage.

The average dates of the opening and closing of the Hayes River, for 50 years, on the authority of Mr. Wood, Government meteorological observer, York Factory, are opening 20th May and closing 23rd November.

Dr. Bell says; "In regard to the bay itself there is no data for the opening or closing of navigation because the bay is open all the year round, like the ocean in corresponding latitudes."

Temperature:—The following is from the Meteorological Department, Toronto.

Mean average temperature at York Factory is about:

May	35
June	55
July	66
August	57
September	44
October	25

Mr. C.N. Bell in Our Northern Waters, says: "It will be understood that the readings at York are taken at the fort, which is on tide water, and has been described as most exposed."

"The fact of the water in the rivers rushing down before the ice is broken up

at the lower levels, proves that the climate, inland is more genial."

Lake Winnipeg is navigable from Norway House to the mouth of the Red River and the latter stream can at a moderate expenditure be made navigable from its mouth to the city of Winnipeg.

The following table shows a comparison in detail between the Nelson and St. Lawrence routes, from the great wheat area to Liverpool. The dates for the St. Lawrence are on the authority of Mr. Cortrell.

From wheat area to Liverpool:—

	Miles.	Time in hours.	No. of days route open.	Cost per ton.
Via Chicago	5,488	414	295	\$8.97
Via Winnipeg...	3,826	287	170	4.00

The rates used in the above statement of list are:

Railway rate per ton, mile.....	005
Lake " " " " " " " " " " " "	0015
Canal " " " " " " " " " " " "	003
Ocean " " " " " " " " " " " "	0005

Present western rates are higher than the above, but in making the comparison it is of course necessary to use the same rate for both

The rates of speed from which time in hours is computed are: Rail, including stops, miles per hour, 15; Canal and river, 10; Lakes and ocean, 15.

By reducing the time and distances to the equivalent number of round trips which can be made in a season from Chicago and Winnipeg to Liverpool; it is found that from Chicago seven and one-half round trips are possible and from Winnipeg eight round trips are possible.

That the Hudson's strait may not open at the same time as the inland navigation, or that they may not be open as long each season, which is taking the worst possible view of the case, does not materially affect the value of the route, because it will in any event be necessary to elevate the grain at the ocean terminus. The straits are open a sufficient length of time for all practical purposes. The Dominion Government and the Winnipeg & Hudson's Bay Railway Co. have demonstrated that fact in the interest, and to the satisfaction of the latter, and the railway, which has been commenced, will be in operation to York or Churchill it is expected, in a year or two.

It is certain that within the next de-

cade the quantity of wheat for export from the Canadian Northwest and the adjoining states of the Union, will reach 200,000,000 bushels.

This wheat can be delivered at Winnipeg with an average rail haul of about 200 miles, as against 1,000 miles to Chicago, the difference in favor of Winnipeg being equivalent to a saving of 12 cents per bushel or in round figures \$24,000,000; add to this a saving of \$1 per ton to Liverpool via the Hudson's Bay route, and the outgoing freight alone, shows a saving of \$30,000,000 per annum in favor of that route.

By applying the above rates to the distances of the St. Lawrence route via Port Arthur or Duluth, it will be found that the Winnipeg and Hudson's Bay route is much superior in point of time, distance and cost; in fact that it is the natural outlet and highway from Western North America to Europe.

As to whether the Nelson or Hayes route is the most favorable, or which is the best point on the Bay for an ocean terminus, it is not intended to express an opinion.

The object of this article will be attained if it has thrown any light upon the subject which will show the practicability and great importance of the Hudson's Bay route.

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The Shadow of a Wrong.

BY ALI WAL NORTH.

(For the Manitoban.)

"I KNOW you will like him, dear; every one likes Bertie." The speaker was a lady of middle age and anyone within range of her voice could not fail to detect the maternal love and pride with which she pronounced the name of her son. Her listener made no answer to the remark, her silence being hardly noticed by her companion who continued reading the letter which had just arrived by the mail from India and was being perused at the breakfast table at the Towers. Poor Gracie! all her dreams of being all in all

