

ANNUAL REPORTS  
OF THE  
HARBOUR COMMISSIONERS  
OF MONTREAL  
FOR THE YEAR 1879.



Commissioners :

ANDREW ROBERTSON, Esq., *Chairman.*

J. B. ROLLAND, Esq.

HUGH McLENNAN, Esq.

EDWARD MURPHY, Esq.

CHARLES H. GOULD, Esq.

HENRY BULMER, Esq.

SEVERE RIVARD, Esq. (*Mayor.*)

VICTOR HUDON, Esq.

ANDREW ALLAN, Esq.

H. D. WHITNEY, *Secretary.*

Montreal:

PUBLISHED BY ORDER OF THE HARBOUR COMMISSIONERS OF MONTREAL.

1880.

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# STATEMENT

MADE BY

MR. ANDREW ROBERTSON, Chairman,

ON THE

*Business of the Port for the Year 1879, and other matters connected  
with the Trust,*

AT THE PUBLIC MONTHLY MEETING OF THE BOARD, HELD ON THE 12TH FEB'Y, 1880.

MR. ROBERTSON said—In presenting the accounts for 1879, it is gratifying to be able to state that the revenue is considerably in excess of the previous year. The total revenue having been for 1878.....\$228,726 and for 1879..... 269,596

Increase .....\$ 40,870

An analysis of the statement shows that the inward wharfage on goods has increased by.....\$24,992  
Outward wharfage on goods by..... 11,268  
Tonnage dues on vessels by..... 11,747

Making in all.....\$48,007

On the other side, there are decreases as follows :

In the local traffic of .....\$5,267  
and in sundries of..... 1,870

\$7,137

Leaving (as already mentioned) a net increase for the past year of .....\$40,870

It may not be out of place here to say that in looking whence the increase in revenue was derived, the first large item was from

sugar. The imports of this article were, via the St. Lawrence, in 1878, over twelve million pounds, say.....12,289,843 lbs. and in 1879 .....64,375,656 "

an increase of.....52,085,813 "  
and which yielded to the revenue \$7,800 more than the previous year.

To bring this quantity of sugar to our wharves there were employed (besides partial cargoes) no less than 45 vessels laden with sugar, aggregating 20,731 tons, and whose tonnage dues yielded to the harbour a revenue of \$4,552, while it may be safely estimated that the outward wharfage dues paid on these vessels was not less than \$5,000 more.

The quantity of iron imported exceeds that of last year by nearly 44,000 tons, yielding a revenue of \$11,000. The tonnage dues would also be considerable, as well as the outward wharfage dues, but the exact particulars it has not been possible to obtain.

Coal is another large item of increase, the imports via the harbour for 1879 being .....189,231 tons and for the previous year.....142,754 "

an increase for the year of..... 46,477 "

The quantity from the Maritime Provinces last year... 55,917 tons and this year.....117,256 "

an increase of ..... 61,339 tons

The additional revenue derivable from this source is on coal, \$4,600; and the increase of tonnage and the wharfage outward will make this item at least as much more. These articles make up a very large part of the increase in the revenue, and demonstrate clearly the advantage of inward freights in bringing tonnage to the port.

The insurance on the plant has been consolidated, divided among eight Companies in equal parts, and a saving to the Trust of about \$1,200 a year has been effected.

The statements of the Harbour Master, Captain Rudolf, are very carefully compiled. These show the ocean tonnage to

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British and foreign ports, the Maritime Provinces, and the inland or local traffic. They may be condensed as follows:

	Vessels.	Tons.	Increase.
British and foreign—1878.....	351	346,740	
“ “ “ 1879.....	392	418,549	
Increase .....	41	71,809	20 $\frac{3}{4}$ %
Maritime Provinces—1878....	165	50,526	
“ “ —1879....	220	88,380	
Increase .....	55	37,854	75%
Local—1878.....	5502	764,243	
“ —1879.....	5698	877,243	
Increase .....	196	113,000	7%
Grand Total—1878.....	6018	1,161,509	
“ “ 1879.....	6300	1,324,202	
Increase .....	282	162,693	14%

#### SHIP CHANNEL.

Gratifying progress has been made in the deepening of the Ship Channel to 25 feet, the most important step of the year being the opening of one half the breadth of the new Channel through the rock at Cap la Roche, affording at least a depth of 19 ft. 6, with an addition of 1 $\frac{1}{2}$  to 10 ft., according to the time of year and state of tide, and giving an increased depth of about 3 ft. over that in the old Channel at the same point.

In Lake St. Peter, which is still the most extensive though not the most formidable part of the work, nearly one-third of the whole length of the dredging has been carried down to the full depth; at Contrecoeur a new Channel about one-third of the length is also completed to the same depth, and important improvements have been made at Levraut, Champlain and other points.

The cost of maintaining and working the dredging fleet for the year is \$137,253, which compares favorably with the expenditures of previous years.

## MONTREAL HARBOUR.

The principal works in the Harbour are the further deepening and improvement of the Ship Channel within the Harbour, to keep pace with the deepening in the River below; the extension upwards of the Windmill Point Basin and Wharf; alterations in the line of the wharves in Sections 13 and 14, by which some 30,000 feet area of land space is reclaimed and improved wharfage obtained for large steamships; the rebuilding of the inner side of the Island Wharf in deep water and the dredging out of the whole Basin; the deepening of the Basin of Sections 16 and 17 (Dominion and London Steamship berths), and also the renewal of a considerable part of Victoria Pier above water.

The expenditure for dredging in the Harbour for the year has been \$41,006 for a quantity of 189,600 yards, which compared with previous years shews a steady decrease of cost and increase of work.

Permission was granted, as a trial, to lay a railway track over the wharves at Hochelaga and across the river, within the jurisdiction of the Commissioners, towards Longueuil. This is now an accomplished fact. The experiment so far seems to be successful, and it is to be hoped that no difficulty in taking up the track will be felt, and that it will be safely removed before the breaking up of the ice in the spring.

Permission was also granted to the St. Lawrence and Pacific Railway Ferry Co. to cut the ice between the Longueuil Ferry wharf and Ile Ronde, where they propose to put on a steamboat, connecting by a bridge from Ile Ronde to Longueuil shore. They hope to run summer and winter, carrying freight cars across. This proposal is also a novel one. In so far as it appears this winter the project seems feasible, and should it prove successful will no doubt be of advantage to the Railways making connection, as well as increasing the revenues of the harbour.

As considerable discussion has lately taken place regarding our Harbour dues, Pilotage and Towage charges, as bearing on the interests of the Port, I have taken some trouble to obtain as much information on the respective questions as the time and circumstances would allow.

In order to put the facts before you as clearly as possible, I have selected the last decade, and for purpose of comparison have taken the years 1870, 1874 and 1879, being five years respectively between them. Let it, however, be borne in mind that the

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## STEAM

Year.	No. of
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Year.	No. of
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Year.	No. of
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year 1874 was the culminating point in the history of our Harbour, that being up to that time the year of greatest tonnage and greatest revenue that had been obtained. The year 1879 ending the decade shows the largest tonnage over any previous year; the Revenue, however, being under that of 1874.

Let me now call your attention to the following statement which in the first place deals with steam vessels to British and Foreign Ports.

Second, to sailing vessels to British and Foreign Ports.

Third, to steamers to the Maritime Provinces.

Fourth, to sailing vessels to the Maritime Provinces.

#### STEAM VESSELS TO BRITISH AND FOREIGN PORTS.

Year.	No. of Vessels	Tonnage.	Average size.	Percentage of increase.
1870	92	115,320	1253	
1874	166	316,920	1307	
1879	226	351,839	1537	205 p. c. over 1870

#### SAILING VESSELS TO BRITISH AND FOREIGN PORTS

Year.	No. of Vessels	Tonnage.	Average size.	Percentage of decrease.
1870	344	154,725	449	
1874	289	142,070	491	
1879	224	117,104	522	25 p. c. less than 1870

#### STEAMERS TO THE MARITIME PROVINCES.

Year.	No. of Vessels	Tonnage.	Average size.	Percentage of increase.
1870	52	18,592	357	
1874	100	45,909	459	About 150 p.c. over 1870
1879	63	26,514	420	42 p. c. over 1870.

## SAILING VESSELS TO THE MARITIME PROVINCES.

Year.	No. of Vessels	Tonnage.	Average size.	Percentage of decrease.
1870	192	18,209	95	37 p. c. less than 1870
1874	176	19,257	109	
1879	99	11,512	116	

## LOCAL VESSELS.

Year.	No. of Vessels	Tonnage.	Percentage of increase.
1870	6345	819,476	14 p. c. over 1870.
1874	6885	824,787	
1879	5698	936,782	

It will be observed that from the decade, 1870 to 1879, the increase of steamers to British and Foreign Ports has been 205 per cent., while the sailing vessels have in the same time fallen off 25 per cent. I merely call your attention to the fact, leaving you to judge whether this falling off in sailing vessels is only applicable to this port in consequence of our towage, pilotage and other charges, or whether it may not be largely attributed to the fact that steamers, not only at this port, but elsewhere are largely superseding sailing vessels.

Now let us look at the vessels to the Maritime Provinces, while those to Europe and elsewhere show an increase in steam and a similar decrease in sailing vessels; steamers to the Maritime Provinces increased from 1870 to 1874 nearly 150 per cent.; since then they have gradually fallen away till they now stand at 42 per cent. increase on 1870; sailing vessels, which show about 5 per cent. gain from 1870 to 1874, now show 37 per cent. less since the last named period. I am not prepared to say that this decrease in tonnage to the Maritime Provinces is due to, but it must be largely caused by, the facility which the Intercolonial Railway is affording to the trade.

The local vessels show an increased tonnage of 14 per cent. between the years 1870 and 1879. This increase has almost all

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been gained since 1874. (The year 1879 alone showing an increase of 7 per cent.)

The revenue derived from harbour dues on local traffic was \$63,265 in 1874, against \$55,080 in 1879, or a reduction of 12½ per cent. This shows that the vessels cannot be carrying so many goods as formerly, and this is also probably to be accounted for by the opening of the railway system on the north shore of the St. Lawrence.

#### PILOTAGE.

The pilotage charges below Quebec are divided among the pilots equally, irrespective of their individual earnings; the amount earned by each going into one common fund. The number of pilots this year, among whom the fund was divided, was 188, and their average earnings was \$488. The previous year their earnings averaged \$455.

The pilotage between Quebec and Montreal is under the jurisdiction of the Harbour Commissioners of Montreal, and may be said to have been conducted last year by 39 pilots, although 43 were on the list. The earnings of these 39 pilots yielded an average of \$962. The highest amount received was \$1771, and the lowest was \$650. The earnings for the previous year averaged \$725 each, the highest being \$1757, and the lowest \$500. In using the word lowest in these instances it is supposed the pilots have been working through the season, as sometimes illness, suspension, or other causes interfere with the earnings of the pilots; these are, therefore, not included in the average.

The difference between the earnings of the pilots below Quebec and those between Quebec and Montreal, it will be observed, is very considerable. The system of division in common below Quebec appears to be very questionable, as it deprives a hard-working man of his due share of the earnings, the drone receiving as much, has no incentive to do his duty, and it has been stated that in bad weather they are very apt to shirk their work.

This does not apply to the pilots above Quebec, who receive their own earnings; the average earnings show that the pilotage above Quebec is probably too high. If this is the case, some modification should, if possible, be entertained.

It has been suggested that vessels between Quebec and Montreal, when in tow of a steamer, should not be obliged to take a



pilot. It is thought that this charge might be saved by making it compulsory for all tugs, towing vessels, to carry branch pilots.

This subject is receiving the earnest consideration of the Board, but as yet no definite decision has been arrived at.

In order that a more equal distribution of the earnings among the pilots should take place, it has been suggested that the regular lines employing pilots should distribute their favours more equally among the pilots. This is strongly recommended to vessel owners, not only in justice to the pilots but to themselves.

#### TOWAGE.

Some years ago, say 1876, a tariff for towage of vessels was established between Quebec and Montreal. The towage below Quebec has been practically carried on without a tariff, each party making their own bargains; the tariff being between Quebec and Montreal, and *vice versa*. For the last two or three years this tariff has not been adhered to, the rates having been so much lowered that, by the tug owners, they are declared to be ruinously low. I have obtained a list of the amounts paid for towage on 80 vessels, of a tonnage of 47,477 tons, averaging 593 tons each, which visited the port during the last two years; 18 vessels, 13,080 tons, having been towed from Quebec, and the balance—62 vessels, 35,013 tons, from places ranging from 28 to 260 miles below Quebec. The cost of towage of the 18 vessels referred to, would have been, under the tariff, \$16,615, but the actual amount paid was only \$5,340, or less than one-third of the *published* tariff.

The cost of the towage of 62 vessels was \$24,053, and the average distance towed was 160 miles below Quebec, and assuming that the same proportionate rate was charged as from Quebec to Montreal Tariff, the cost would have been \$77,053.

As already explained, there being practically no tariff below Quebec, each vessel has to make its own bargain when being towed from wherever the tug meets her, either to Quebec or to Montreal. Any tariff, therefore, which may be made, should, if possible, include the towage below Quebec, as well as Quebec to Montreal.

If the steamboat owners would agree to and publish a reasonable maximum tariff, it would help to prevent overcharges being made on casual vessels, who are said to be frequently imposed on by want of knowledge. This seems to be now the chief source

of complaint posted so that their arrangements

There is no during the last

It seems clear that time can

It has been at a conference between Quebec companies be minimum charges grant to secure a charge advisable to as by the Commission would be only rendered it im

These suggestions Board.

In consideration stated that vessels grain to the orders, are of only wait a already called ing vessels had steamers had 600 tons which for outports of averaging 315

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It will be increased near the tendency the immense year by year Quebec and M

of complaint, the captains of regular traders being sufficiently posted so that they can take care of themselves when making their arrangements with the tugs.

There is no doubt that the rates charged by the tug owners, during the last two years, have been disastrous to them as a class.

It seems clear that cheaper rates than have prevailed during that time can hardly be expected.

It has been suggested by a deputation of the Board of Trade at a conference held lately, that the different existing Tug-boat companies be invited to unite in forming an effective service between Quebec and Montreal, and to frame a tariff on the minimum charge for towage last year, and that the Commissioners grant to such combination, a subsidy, if necessary, in order to secure a cheap and effective service. Failing this, it might be advisable to ask Parliament for power to build tugs to be worked by the Commissioners, or by a company. The power, if granted, would be only permissive,—to be used only when circumstances rendered it imperative.

These suggestions will have the due consideration of the Board.

In considering the towage question, it has generally been stated that vessels of small burden, say under 600 tons, to carry grain to the outports of Great Britain, and calling at Cork for orders, are of paramount importance and that hundreds of vessels only wait a reasonable rate of towage to come here. I have already called your attention to the fact that the tonnage of sailing vessels had decreased from 1870 to 1879, 25 per cent., while steamers had increased 205 per cent. The sailing vessels under 600 tons which sailed from the port in 1870 with grain cargoes for outports or for orders were 140 vessels. Total tonnage 46,948, averaging 315 tons per vessel.

The number of vessels in 1879 was 98, total tonnage 40,244 tons, averaging 411 tons each. Thus showing a decrease of tonnage of barely 15 per cent., as against the 25 per cent. of reduction in sailing vessels of all sizes coming to the port.

It will be noted that the size of these small vessels has increased nearly one-third in the decade, and, as has been shown, the tendency is in every class of vessel to an increase of size, while the immense increase of steam tonnage is no doubt gradually year by year helping to solve the problem of towage between Quebec and Montreal.

The exports of grain were:—

In 1870.....	13,601,310 bushels.
1874.....	16,739,580 “
1879.....	22,755,946 “

The largest quantity hitherto shipped; being an increase of 67 per cent. in the decade, which, if not such a ratio of increase as some of the other Atlantic ports which are open all the year round, yet shows that we are making substantial progress.

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WM. SMITH, Esq.

*Deputy*

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RECEIPTS AND EXPENDITURE  
OF THE  
HARBOUR COMMISSIONERS OF MONTREAL  
*For the Year 1879.*

HARBOUR COMMISSIONERS OF MONTREAL,  
*Secretary's Office,*  
MONTREAL, 23rd January, 1880.

WM. SMITH, Esq.,  
*Deputy Minister of Marine and Fisheries,*  
OTTAWA.

SIR,

I have the honour, by direction of the Harbour Commissioners of Montreal, to transmit herewith, for the information of the Honourable the Minister of Marine and Fisheries, statements of the Receipts and Disbursements of the Trust for the year ended the 31st December, 1879.

The receipts from all sources were as follows, viz. :—

FROM COLLECTOR OF CUSTOMS, MONTREAL :

On goods subject to specific wharfage—Inwards...	\$84,207.08	
“ “ “ “ —Outwards...	67,644.81	
Harbour Dues on Sailing Vessels and Steamships...	58,417.05	
	210,268.94	

126.061

LOCAL TRAFFIC.

Wharfage on goods—Inwards .....	\$5,559.13	
“ “ —Outwards .....	1,089.31	
Harbour Dues on Barges .....	17,624.98	
	24,273.42	
<i>Carried forward</i> .....	\$24,273.42	210,268.94

<i>Brought forward</i> .....	\$24,273.42	\$210,268.94
Harbour Dues on Steamers .....	4,391.17	
Commutation " " .....	18,500.00	
Received for piling Lumber on the Wharves.....	3,384.00	
"    "    Wood    "    "    .....	1,050.60	
"    "    storing Coal    "    "    .....	1,485.91	
"    "    Weigh Scales    "    "    .....	1,105.00	
"    "    Rent of small Offices    "    .....	813.85	
"    "    Penalties .....	77.00	
		<u>55,080.95</u>
<b>NET REVENUE</b> .....		<b>\$265,349.89</b>

FROM DOMINION GOVERNMENT :

Received on account new Channel operations ..... \$96,000.00

SUNDRY AMOUNTS RECEIVED FOR CREDIT NEW CHANNEL OPERATIONS :

Richelieu & Ontario Navigation Co.—Oak .....	\$35.17	
G. A. Pontbriand, —Scrap Steel .....	15.84	
Sincennes, McNaughton Line, —Rent .....	90.00	
H. & A. Allan, —Timber, Rent, &c. ....	163.52	
D. & J. McCarthy, —Timber .....	9.63	
J. Meany, —Rent .....	36.00	
		<u>350.16</u>
Rent of Offices in Old Building.....	720.00	
"    "    New    "    .....	1,625.00	
Fines Collected .....	106.25	
Interest on Bank Accounts .....	3,631.51	

SUNDRY AMOUNTS RECEIVED FOR CREDIT OF HARBOUR DREDGING :

Canadian Rubber Company—Coal Oil Barrels .....	\$31.50	
Overpaid Mme. Malo, returned .....	3.00	
J. McIntosh & Son, —Pair of Bellows ....	14.00	
Pillow, Hersey & Co., —Scrap Iron.....	417.37	
Jos. Duchene, —Barge "Cato".....	27.00	
British America Insurance Co.—Hire of Derrick, &c. ....	149.50	
J. Worthington & Co., —Towing Scows.....	960.00	
		<u>1,602.37</u>

SUNDRY AMOUNTS RECEIVED FOR CREDIT OF HARBOUR REPAIRS :

J. T. Therien, —Sale of old Plank.....	\$16.75	
South-Eastern Ry—Cost of Slip.....	35.78	
Roach & Brown, —Damage to Wharf.....	2.10	
		<u>54.63</u>

**TOTAL RECEIPTS** ..... **\$369,439.81**

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Interest on Harbo  
Harbour Survey  
    "    Repairs.  
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Buoys and Beacon  
Wharfages Return  
Expenses collecti  
    "    erecting  
Travelling and In  
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CONSTRUCTION ACC  
Windmill Point  
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\$48,006 more  
fallen \$5,266  
increased rai  
St. Lawrence  
freight being  
by water.



The expenditure was as follows, viz. :—

New Channel Operations .....	\$142,205.78
Interest on Harbour Debt.....	108,875.73 ✓
Harbour Survey .....	385.18
"    Repairs.....	18,874.28
"    Dredging .....	37,505.43
"    Expenses.....	24,604.58
Printing, Advertising and Stationery.....	1,658.16
Buoys and Beacons .....	5,828.71 ✓
Wharfages Returned .....	210.80
Expenses collecting Wharfage at Longue Pointe.....	6.50
"    erecting Platforms .....	27.40
Travelling and Incidental Expenses.....	289.73
Lighting Wharves.....	774.99

210,268.94  
55,080.95  
265,349.89  
\$96,000.00

CONSTRUCTION ACCOUNT, as under—

Windmill Point Wharf .....	\$18,113.99
Section 29 .....	240.83
Hochelaga Wharf.....	812.86
Sections 13-14 .....	5,106.38
King's Basin .....	2,221.62
Longue Pointe Wharf.....	111.30
	<hr/>
	26,606.98
Legal Expenses.....	967.79
Revetment Wall Repairs .....	38.50
Chain Tug.....	264.23
New Dredging Plant, 2 Scows.....	4,287.63
Sundry Accounts written off .....	462.54
Dominion Government Interest .....	54,532.72 ✓

TOTAL EXPENDITURE .....

\$428,404.66

The receipts from wharfage are the largest we have ever had, with the exception of 1874; the total, as compared with 1878, shows an increase of \$42,739; the amount received on sea-going vessels and their cargoes being \$48,006 more than last year, while the local traffic has fallen \$5,266. This falling off is largely caused by the increased railway facilities along the north shore of the St. Lawrence and elsewhere, considerable quantities of freight being now carried by rail which formerly went by water.

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1,625.00  
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For full particulars of the operations within the Harbour, I would refer you to the Chief Engineer's report, a copy of which is forwarded you.

I also send you copies of the following Annual Reports (1st) of the Harbour Master, with comparative statements of the trade of the Port, (2nd) of the Superintendent of Pilots with reference to the maintenance of the buoys in the river, and (3rd) on matters connected with the Pilotage District of Montreal.

From the Harbour Master's statements, it will be noticed that a greater amount of tonnage has come to the port than in any previous year, being 83,546 tons in excess of 1874, the largest year before this. The average size of the vessels has also increased about 43 per cent—viz., from 579 tons in 1874 to 827 tons in 1879.

The work of deepening the ship channel to Quebec is being carried on in a satisfactory manner; a report on the same up to the close of the fiscal year has already been forwarded to the Department of Public Works, under whose supervision these works are being carried on.

Application was made by the Quebec Government, late in the year, for more railway accommodation on the wharves, (the proposition for right of way over the Harbour property to the Quebec Gate Barracks never having been carried out), to permit of a transfer of freight, &c., between the Quebec, Montreal, Ottawa & Occidental Railway and the South-Eastern Railway at Longueuil. This request the Commissioners have yet under consideration.

I have the honour to be,

Sir,

Your most obedient servant,

(Signed,)

H. D. WHITNEY,

*Secretary.*

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REPORT ON THE WORKS  
FOR THE  
IMPROVEMENT AND MAINTENANCE  
OF THE  
HARBOUR OF MONTREAL  
For the Year 1879.

JOHN KENNEDY, M. Inst. C.E., *Chief Engineer.*

HARBOUR COMMISSIONERS OF MONTREAL,

Chief Engineer's Office,

MONTREAL, 20th January, 1880.

H. D. WHITNEY, Esq.,

*Secretary.*

SIR,

I beg to submit, for the information of the Board of Harbour Commissioners, the following Report upon the works in the Harbour of Montreal during the year 1879.

The principal works of the year are the further deepening and improvement of the Ship Channel through the Harbour; the extension of the Windmill Point basin and wharf; alterations in Sections 13 and 14; deepening the basin and renewal of the inshore side of the Island Wharf (Section 15) in deep water; deepening the basin of sections 16 and 17 (Merchants' Basin); and the renewal of a considerable part of the superstructure of Victoria Pier (Section 20.)

The following are the chief details:—

*Sections 5 to 11 (Windmill Point Basin and Wharf.)—*  
The crib-work wharf has been extended up stream, in

Section six, 451 feet, making now a continuous length of 2,628 feet from the lower corner of the wharf between Sections 10 and 11, or opposite the mouth of the Lachine Canal. The extension of this year is completed, with the exception of a portion of the planking and a small part of the back filling. Two race-ways (Nos. 5 and 6) of crib-work, similar to the main wharf, are built in connection with it; one of 8 feet high by 12 feet wide inside, by 110 feet in length from the face of the wharf, being for the water from Peck, Benny & Co.'s Mills, and the other of 100 feet long, with two openings, one of which is 8 feet high by 14 feet wide, for discharging water also from Peck, Benny & Co.'s, and one of 8 feet high by 22 feet wide, discharging the water from McDougall & Co.'s Mills. Cost of crib-work wharf and race-ways, \$9,866; wharf and back-filling, \$2,239. Total, \$12,105.

In Section 8, the gap of 162 feet which existed between the race-way built by Government from the new Canal waste weir, and the part built by the Harbour Commissioners, was closed by the extension of the latter. The extension is of the usual crib-work, covered, and having an opening of 25 feet wide and 8 feet high. The pond and low ground through which the extension was made were also filled up with dredgings, and about 25,000 square feet additional wharf room thus obtained. Cost of race-way, \$1,979; filling, \$2,197. Total, \$4,176.

The dredging of the basin has been carried up abreast of the new extension of the wharf, to an average width of 250 feet and a depth of 15 feet; small obstructions and deposits have also been removed from the lower end of the basin. Total quantity dredged, 75,663 cubic yards. Cost, \$18,800.

The water in Section 11, between the new Canal and the outer corner of the wharf, which, in 1878, was about 16 feet in depth alongside the wharf, was found to be still more shallow last spring from small banks of deposit which have formed on it, and the whole was, therefore,

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dredged out to an effective depth of 20 feet. Quantity dredged, 6,253 cubic yards. Cost, \$1,584.

*Section 12 (Queen's Basin).*—A few small lumps were dredged out of the upper part of the basin.

*Sections 13 and 14.*—In order to obtain better wharfage for large vessels, the outer end of Wellington Pier was cut off in the latter part of the summer, and the wharf extended across Metcalfe Basin in line with the wharf in Sections 12 and 13, at 25 feet depth at low water, thus abolishing both the basin and pier, and giving a continuous line of deep water wharf 1,228 feet in length and an additional area of ground in rear of the wharf of 29,400 square feet. The frontage of wharf will be reduced by 261 lineal feet, the difference between the length of the new straight wharf and that which enclosed the pier and basin, but its effective value for large vessels will be considerably enhanced.

The new portion of wharf, which is 328 feet in length, and of the usual crib-work sunk in 25 feet depth at low water, is now carried up to 6 feet above low water mark, and the filling of the basin is on the average up to about the height of low water, leaving the remainder to be completed in the coming spring.

Besides the dredging in the removal of the end of Wellington Pier, and in the site of the new wharf, a considerable amount has been taken out in front of the pier and basin, in order to deepen the whole to 25 feet. The expenditures thus far are:—Timber wharf, \$4,327; back-filling (hand labour), \$743; dredging, \$4,351. Total, \$9,421.

*Elgin Basin.*—The lower part of Section 14 has been cleaned out and deepened to 25 feet as close to the wharves as their foundations would permit. Expenditure, \$2,648.

*Section 15.*—The inner side of the Island wharf, which was one of the old pile wharves built in 1831, and with only 5 to 10 feet available depth of water, was this

year replaced by a new pile wharf on the same line, but with the water deepened so as to accommodate a draught of 24 feet at low water. The interior of the basin has also been dredged over and practically completed to the same depth, but it remains yet to be proved, and the approach requires further deepening.

It will be remembered that in 1878 the wharves on the inshore and Albert pier sides of the basin were renewed, and the renewal of the remaining side this year, therefore, completes the building of the whole, and gives 1,010 feet additional deep water wharfage in one of the most valuable positions in the Harbour. The expenditures this year are :—New wharf, 285 lineal feet, \$2,224; dredging, \$2,436. Total, \$4,660.

*Sections 16 and 17.*—The berths in front of the wharves 900 feet in extent, and the approaches from deep water, were dredged out to a depth of 25 feet at low water. Expenditure, \$1,655.

*Sections 21 and 22.*—A part of the Chain-tug's chain, which lay along the shoal extending downwards from the Victoria Pier, was this year taken up and an opening dredged through the shoal from near the end of the pier to opposite the Military Hospital, so as to allow of access to the deep water berths inside. Expenditure, \$1,915.

*Section 24.*—A considerable amount of dredging was done in deepening alongside the wharf and clearing away the inner side of the same shoal in front of Section 24. Expenditure, \$1,182.

*Ship Channel in the Harbour.*—At various points between Sections 13 and 22, but particularly opposite Sections 14 and 15, and 20 and 21, small shoals and points which remained from last year's dredging, were removed to 25 feet at low water. Total dredged, 22,139 cubic yards at an expenditure of \$6,101.

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## HARBOUR REPAIRS.

In Section 20 a length of 785 feet of the outer and up-stream sides of the Victoria Pier, and also a length of 308 feet of the inner side, extending from the angle downwards, have been renewed from an average of about 5 feet above low water line upward, and have been raised to the standard level of new wharves. Expenditure, \$4,160.

With this exception the repairs in the Harbour have been light work of the usual character required in the maintenance of the wharves and roadways.

Pending the possible introduction of electric light, or some improved system of gas, the lighting of the wharves has been continued by means of coal oil lamps with double burners, as before; but they have this year been maintained by the Commissioners' own men and materials, instead of by contract, as for many years past. The cost for 66 lamps was, for the 31 weeks in which they were lighted, \$774, which is materially less than before.

The total expenditure under the head of Harbour Repairs for the year has been \$18,819, and compares as follows with the previous four years:

1875.....	\$16,449
1876.....	35,711
1877.....	26,077
1878.....	18,974
1879.....	18,819

## DREDGING.

The dredging plant—the property of the Commissioners—engaged in the harbour work during the year consisted of five spoon dredges, two clam-shell derricks for unloading scows, three screw tugs, sixteen flat scows, two to six dumping scows, and one floating shop for machinery repairs.

The dredges and one tug were wintered at Sorel, the derricks and two tugs at Chenal-du-Moine, and the scows at Boucherville; and in the last week of April, as soon as



the clearing away of the ice permitted, the whole were brought up to Montreal. The dredges were set to work on the 2nd May, and continued without serious mishap until the close of navigation—one dredge, which required to be hauled out, being sent to Sorel on the 24th November, and the others following on 1st December.

One of the spoon dredges spent 37 days in the Ship Channel at Pointe-du-Lac, and others at different times spent 129 days in Ship Channel work in the Harbour, making 166 days in all in Ship Channel service, which, with 738 days engaged in Harbour work proper, makes an aggregate of 904 days' service for the five dredges during the season, or an average of 180 days each. The nominal working time is ten hours per day, which gives a total of 8,670 hours service within the Harbour; but the actual dredging time, after deducting time lost for repairs, changing positions, detention by vessels, short days in autumn, and all other causes, is reduced to 7,755 hours, or an average of 89 $\frac{1}{2}$ % per cent. of the gross time of service, as against 87 $\frac{3}{4}$ % per cent. for 1878, 88 $\frac{1}{2}$ % for 1877, 84% for 1876, and 82% for 1875.

The cost of the fleet for work within the Harbour was \$41,006, which includes wages, fuel, stores and proportion of general charges for insurance, spring outfit and repairs, and all other charges except interest and depreciation.

Compared with the four previous years, the results are as follows:—

YEAR.	Cost.	Cubic Yards Dredged.	Cost per Cubic Yard. Cents.
1875.....	\$68,979	151,719	45
1876.....	55,462	156,082	35 $\frac{1}{2}$
1877.....	45,103	173,449	26
1878.....	48,748	211,751	23
1879.....	44,106	189,609	21 $\frac{53}{100}$

The following dredging

*Sections 5 to* ing the basin from the low two to thirty ing); total d or 24 $\frac{56}{100}$  cents

*Section 11* out sediment twenty-eight or 25 $\frac{1}{2}$  cents

*Sections 12* lumps and d feet water: cubic yard.

*Sections 13* site for crib old crib-work 21,903 cubic yard.

*Section 14* posit, hard- 12,768 cubic yard.

*Section 15* sand; 10 t \$2,436, or

*Sections 16* sand; 18 t \$1,655, or

*Sections 17* sand, grav 10,091 cub yard.

The following are the different parts of the Harbour at which dredging has been done and the cost of the same:—

*Sections 5 to 8 (Windmill Point)*—Enlarging and extending the basin at the upper end, and clearing small lumps from the lower end, chiefly shale, hard-pan and boulders; two to thirty feet of water (actual depths at time of dredging); total dredged, 75,663 cubic yards, costing \$18,800, or 24<sup>5</sup>/<sub>100</sub> cents per cubic yard.

*Section 11 (Windmill Point)*—Deepening and clearing out sediment, boulders, gravel and sand; twenty to twenty-eight feet of water; 6,255 cubic yards, cost \$1,584, or 25<sup>1</sup>/<sub>2</sub> cents per cubic yard.

*Sections 12 and 13 (Queen's Basin)*—Clearing out small lumps and deposit hard-pan and soft deposit; twenty-five feet water; 1,338 cubic yards, cost \$331, or 24<sup>3</sup>/<sub>4</sub> cents per cubic yard.

*Sections 13 and 14*—Clearing out old pier, preparing site for crib work, deepening basin, &c.; clay, hard-pan, old crib-work, &c.; eight feet above water to 25 feet below; 21,903 cubic yards, cost \$4,351, or 19<sup>5</sup>/<sub>100</sub> cents per cubic yard.

*Section 14 (Elgin Basin)*—Deepening basin; sewage deposit, hard-pan, and some shale; twenty-five feet water; 12,768 cubic yards, costing \$2,649, or 20<sup>3</sup>/<sub>4</sub> cents per cubic yard.

*Section 15 (King's Basin)*—Deepening basin; chiefly sand; 10 to 25 feet of water; 16,312 cubic yards, costing \$2,436, or 14<sup>33</sup>/<sub>100</sub> cents per cubic yard.

*Sections 16 and 17*—Deepening basin; clay, gravel and sand; 18 to 25 feet of water; 16,829 cubic yards, costing \$1,655, or 9<sup>1</sup>/<sub>2</sub> cents per cubic yard.

*Sections 21 and 22 (Military Basin)*—Deepening basin; sand, gravel, boulders and clay; 20 to 25 feet of water; 10,091 cubic yards, costing \$1,916, or 19 cents per cubic yard.



*Section 24*—Deepening front of wharf; sand, gravel and clay; 20 to 25 feet of water; 6,311 cubic yards, costing \$1,182, or 18 $\frac{3}{4}$  cents per cubic yard.

*Ship Channel, opposite Sections 13 to 21*—Cutting away small shoals and lumps; hard-pan, gravel, boulders and clay; 22 to 28 feet depth of water; much detention by vessels; 22,139 cubic yards, costing \$6,101, or 27 $\frac{5}{100}$  cents per cubic yard.

Yours respectfully,

JOHN KENNEDY,  
*Chief Engineer.*

ABSTRACT OF DREDGINGS

PLACES WHERE  
DREDGES WERE

Section 5 to 8.....  
Windmill Point.....

Section 11, Windmill  
Sections 12-13 (Queen  
Basin) .....  
Sections 13-14, No  
Wharf.....

Section 14.....  
Elgin Basin.....

Section 13 (King's B  
Sections 16-17.....

Sections 21-22.....

Section 24.....

Ship Channel .....  
Sec. 13 to 22.....

Gross Total.....

## ABSTRACT OF DREDGING DONE IN THE HARBOUR OF MONTREAL IN 1879.

PLACES WHERE DREDGES WORKED.	DREDGES.	Quantities dredged at each place.		Dredged totals.	REMARKS.
		Cub. Yds.	Cub. Yds.		
Section 5 to 8.....	Dredge No. 2..	11,430			
Windmill Point.....	" No. 4..	26,077			
	" No. 5..	13,268			
	" No. 6..	16,500			
	" No. 7..	8,370		75,663	Shale, hard-pan, boulders and gravel.
Section 11, Windmill Pt.	" No. 7..	6,255	6,255		Sand and fine gravel.
Sections 12-13 (Queen's } Basin) .....	" No. 5..	1,338	1,338		Hard-pan, boulders and silt.
Sections 13-14, New } Wharf .....	" No. 5..	6,165			
	" No. 6..	15,738		21,903	Hard-pan, sand, clay and gravel.
Section 14.....	" No. 5..	11,688			
Elgin Basin.....	" No. 6..	1,080		12,768	Hard-pan, shale, and sewage deposit.
Section 13 (King's Basin)	" No. 2..	16,312	16,312		Clay and sand.
Sections 16-17 .....	" No. 6..	821			
	" No. 7..	16,008		16,829	Sand and gravel.
Sections 21-22.....	" No. 2..	10,091	10,091		Sand and gravel.
Section 24.....	" No. 7..	6,311	6,311		Gravel.
Ship Channel .....	" No. 2..	4,657			
Sec. 13 to 22.....	" No. 4..	3,465			
	" No. 5..	6,120			
	" No. 6..	2,272			
	" No. 7..	5,625			
				22,139	Sand, gravel and boulders.
Gross Total.....				189,609	





REPORT  
OF THE  
HARBOUR MASTER OF THE PORT OF MONTREAL  
*For the Year 1879.*

CAPT. A. M. RUDOLF, *Harbour Master.*

H. D. WHITNEY, ESQ.,  
*Secretary,*  
*Harbour Commissioners of Montreal.*

SIR,

I beg to submit, for the information of the Harbour Commissioners, the following report for 1879, with the accompanying comparative statements showing the numbers, tonnage, classification, &c., &c., of vessels that arrived in port the past ten years.

On the first of January the weather was very fine, wind west, sleighing good, and the water in the river three feet eight inches above the usual summer level; there was a considerable quantity of ice upon the shores, but the channel was free from ice as far as could be seen; in the afternoon, a boat's crew belonging to the celebrated boatsman, Mr. Joseph Vincent, descended the Lachine Rapids in an open boat and arrived safely at the Jacques Cartier Pier at three o'clock. The weather continued fair and seasonable up to the 15th January, when a sharp frost set in, the thermometer registering at 8 a. m. 13° below zero. Ice then formed rapidly and the water began to rise. On the 21st January it was level with the tops of the wharves; on the 25th the river was full of ice; on

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the 26th it became stationary and firm, when a team, and several people on foot crossed the river from Longueuil to Hochelaga. The water continued to rise until the 31st January, when it reached its highest point, 33 feet 4 inches on No. 1 Lock Sill of the Lachine Canal, or 16 feet 4 inches above the summer level. On that day several people crossed the ice on foot from St. Lambert to the city. On the 1st February a road was made on the ice from St. Lambert to the city, and teams crossed. On the 13th a road was made from Laprairie to the city, and teams with hay passed over it the same day. The weather during the month was of a fair average; the last day of the month was the coldest, the thermometer at 8 a. m. registering 10° below zero. The water in the river receded this month about five feet, and the average height of the water during the month was 13½ feet above the summer level.

The weather in March was changeable, but not cold; the lowest temperature at 8 a. m. was on the 6th, the thermometer registering 2°. The average height of the water in the river during the month was 11 feet 10 inches above the summer level.

April commenced with stormy, blustery weather; the 3rd was the coldest day of the month, the thermometer at 8 a. m. registering 18°. As the month advanced the weather grew milder. On the 12th the first shove of the ice took place near the centre piers of the Victoria Bridge, and shoved again the following day breaking up the road to St. Lambert and cutting off the direct communication by the river to that village. On the 15th the road to Laprairie was considered unsafe and abandoned. After that date the ice kept daily moving downward and the water began to rise again. On the 16th the road to Longueuil was considered unsafe and abandoned. On the 18th the ice opposite the city became so closely packed and stationary, that people crossed it again on foot from St. Lambert and Longueuil to the city. The water continued



to rise, and on the 19th reached its highest point, 34 feet 3 inches on No. 1 Lock Sill of the Lachine Canal, or 17 feet 3 inches above the summer level. In the afternoon of that day the whole body of ice moved downward, leaving an open channel from as far as could be seen above Victoria Bridge, down to the Cotton Factory. From that date the ice kept slowly moving downward, and the water began to recede. On the 23rd the ferry steamer *St. Lambert* arrived in port from Boucherville, the water at this time falling rapidly. On the 24th the tops of the wharves were visible. Steam tug "*Georgiana*" with four river craft arrived in port from Boucherville, and the *St. Lambert* ferry steamer commenced running. On the 26th the *Longueuil* ferry steamer commenced running her regular trips. On the 28th the steamer "*Laprairie*" arrived in port and commenced her regular trips on the ferry. Steamers "*Chambly*," "*Hero*," "*Terrebonne*," and "*Berthier*," arrived in port from Sorel. All sheds belonging to steamship companies were in course of erection, Light-houses replaced, as well as the rail along the revetment wall; labourers were employed in clearing and cleaning the wharves, and the Grand Trunk Railroad cars made their first appearance upon the wharves this season, the Harbour then commencing to have quite a lively appearance.

On the 29th April tug steamers "*St. Peter*" and "*St. Louis*" arrived in port from Sorel with a portion of the Harbour plant. On the 1st May the steamer "*Montreal*" (of the Quebec Line) arrived in port from Sorel, and left on the first trip for Quebec the same evening. SS. "*Circassian*" from Liverpool, and SS. "*Waldensian*" from Glasgow, arrived in port this morning, the first vessels from sea. After this date vessels arrived daily, and by the middle of the month there was a considerable number of vessels in port, and business fairly commenced.

The water in the Harbour was unusually low during the navigable season; from the 21st May, when there was

25 feet 7 inches in the Canal, or 8 feet above the summer level. It was usually kept fairly low, its lowest point being only seven feet above the lowest on record. The Trade, as well as the large portions of the goods, were forwarded in light draft vessels.

As the vessels in tonnage should be heavy, and as the shippers' Wharves of water at the class vessel light draft vessels were permitted below the water line, section 33, wharves, and engaged in the business, been so frequent, large sea-galleys were great frequent in them, or being permitted.

When the vessels are completed in that part of the Harbour.

The export proved to be the Coal Trade, the Canal.

The Lachine Canal was quite equal to the



25 feet 7 inches of water on No. 1 Lock Sill of the Lachine Canal, or 8 feet 7 inches above the summer level, it gradually kept falling until the 8th November when it reached its lowest point, 15 feet 5 inches on No. 1 Lock Sill, or one foot seven inches below the usual summer level, (the lowest on record). This was a great drawback to the Trade, as vessels of heavy draft of water had to have a large portion of their cargoes carried inwards and outwards in lighters, causing great expense and much delay.

As the vessels that visit this port are yearly increasing in tonnage and draft of water, all deep water berths should be held in reserve for their special accommodation, and as the Victoria Pier, Military Basin, and Commissioners' Wharf were put down in from 20 feet to 24 feet of water at great cost, for the accommodation of large class vessels, all batteaux, barges and other river craft of light draft of water, with firewood, &c., should not be permitted to occupy these berths any longer, but placed below the Commissioners' Wharf, from Section 24 to Section 33, where there is plenty of water, spacious top wharfage, and in every particular well adapted for those engaged in the wood business. The Military Basin has been so frequently crowded with wood barges, that the large sea-going vessels lying at Sections 20, 21 and 22 were greatly obstructed in discharging and loading, and frequent complaints have been made by those interested in them, of the delay and expense caused by wood barges being permitted to occupy that Basin.

When the improvements going on in Metcalfe Basin are completed it will no doubt greatly facilitate business in that part of the Harbour.

The extension of the works at Windmill Point has proved to be of great advantage to those engaged in the Coal Trade, as well as to the many manufacturers along the Canal.

The Lumber Trade to South America has not been quite equal to that of last year—20 vessels of the aggre-

gate tonnage of 10,868 tons, carrying 8,663,563 feet of lumber, loaded at this port this year against 20 vessels of the aggregate tonnage of 11,013 tons, carrying 8,860,000 feet of lumber the previous year, showing a difference of 145 tons, and 16,437 feet of lumber less than in 1878.

Six hundred and twelve (612) sea-going vessels arrived in this port this season of the aggregate tonnage of 506,969 tons, 321 of which were built of iron of the aggregate tonnage of 405,442 tons, and 291 were built of wood of the aggregate tonnage of 101,527 tons, 289 of which were propelled by steam of the aggregate tonnage of 378,353 tons and 323 were propelled with sail of the aggregate tonnage of 128,616. They were navigated by 15,350 seamen and composed of the following nationalities, numbers and tonnage :

NATIONALITY.	No.	TONNAGE.
British .....	575	488,718
Norwegian.....	11	6,293
Austrian .....	8	4,142
American .....	7	2,125
German .....	6	2,328
Belgian .....	1	1,059
Dutch.....	1	950
Italian .....	1	559
Hungarian.....	1	526
Swedish .....	1	269
Total.....	612	506,969

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The Laprairie ferry steamer ceased running on the 26th November, the St. Lambert ferry steamer on the 4th December, and the Longueuil ferry steamer on the 19th December.

On the 18th December sharp frost set in, ice formed rapidly and the water began to rise. On the 22nd December the weather was very cold, the thermometer at 8 a. m. registering  $22^{\circ}$  below zero, and the following day at 8 a. m. it registered  $9^{\circ}$  below zero. On the 25th December the river opposite the river was full of ice and the water level with the tops of the wharves. On the 27th people on foot and teams crossed the ice from Longueuil to the convent at Hochelaga. On the 28th December the ice shoved heavily, leaving a large space of open water opposite the Cotton Factory, and along the south shore from St. Helen's Island to Victoria bridge; from that date teams crossed the river from about two miles above Longue Pointe to about two miles below Longueuil, to the end of the month, the water then being 16 feet 3 inches above the summer level.

I am, Sir,

Your obedient servant,

(Signed,)

A. M. RUDOLF,

*Harbour Master.*

HARBOUR OFFICE,

*2nd January, 1880.*

## PORT OF MONTREAL.

*Comparative Statement showing the Number and Tonnage of  
Inland Vessels that arrived in Port the past Ten Years,  
with the Dates of the greatest number in Port at one time.*

YEARS.	No. of Vessels.	TONNAGE.	Greatest Number in Port at one time.
1870.....	6345	819,476	255.....Oct'r 6.
1871.....	6878	824,787	281.....Oct'r 6.
1872.....	7150	936,782	309.....June 8.
1873.....	6751	933,462	296.....June 8.
1874.....	6855	956,837	301.....June 14.
1875.....	6178	811,410	256.....Aug. 4.
1876.....	6083	786,983	262.....Nov'r 9.
1877.....	6338	847,978	258.....Oct'r 3.
1878.....	5202	764,243	261.....Oct'r 15.
1879.....	5698	817,423	227.....Nov'r 6.

A. M. RUDOLF,

*Harbour Master.*

HARBOUR OFFICE,

2nd January, 1880.

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## PORT OF MONTREAL.

*Comparative Statement showing the Dates of the Opening and Closing of Navigation, first arrival from Sea, and the last departure for Sea, the past Ten Years.*

YEAR.	Opening of Navigation.	Close of Navigation.	First Arrival from Sea.	Last Departure from Sea.
1870 ....	April 18.	Dec'r 18.	April 22.	Nov'r 27.
1871 ....	" 8.	" 1.	" 22.	" 29.
1872 ....	May 1.	" 8.	May 5.	" 28.
1873 ....	April 25.	Nov'r 26.	" 4.	" 21.
1874 ....	" 25.	Dec'r 13.	" 11.	" 21.
1875 ....	May 3.	Nov'r 29.	" 9.	" 22.
1876 ....	April 27.	Dec'r 10.	" 8.	" 23.
1877 ....	" 17.	Jan'y 2, '78	April 29.	" 24.
1878 ....	March 30.	Dec'r 23.	" 20.	" 24.
1879 ....	April 24.	" 19.	May 1.	" 24.

A. M. RUDOLF,

*Harbour Master*

HARBOUR OFFICE,

2nd January, 1880.

**PORT OF MONTREAL.**  
*Comparative Statement showing the Number, Tonnage and Classification of Sea-going Vessels that arrived in Port from the Maritime Provinces the past Ten Years.*

YEARS.	Steamships.	Tonnage.	Ships.	Tonnage.	Barques.	Tonnage.	Brigs.	Tonnage.	Brigantines.	Tonnage.	Schooners.	Tonnage.	Total No. of Vessels.	Total Tonnage.
1870.....	45	17,731	2	2034	28	13,411	3	768	29	4007	150	12,486	257	50,437
1871.....	42	18,469	4	3488	19	8,449	8	1714	27	3929	133	9,213	233	45,262
1872.....	68	39,378	3	2364	32	16,067	3	523	48	7545	147	11,572	301	77,450
1873.....	91	59,061	6	4790	36	18,595	6	1422	36	4824	98	8,056	273	96,748
1874.....	104	53,903	3	2046	26	15,681	3	622	42	6036	108	10,493	286	88,781
1875.....	120	69,544	3	1874	27	13,180	2	331	35	5397	92	8,526	279	98,852
1876.....	87	47,199	1	739	30	15,451	4	993	25	4220	67	7,322	214	75,924
1877.....	72	39,277	5	4306	25	13,566	3	758	18	2744	37	3,924	160	64,575
1878.....	42	21,812	2	1132	32	15,749	3	954	21	4196	65	6,683	165	50,526
1879.....	62	40,686	2	1733	59	33,271	1	457	16	3660	80	8,573	220	88,380

HARBOUR OFFICE, 2nd January, 1880.

A. M. RUDOLF, Harbour Master.

**PORT OF MONTREAL.**  
*Comparative Statement showing the Number, Tonnage and Classification of Sea-going Vessels that arrived in Port the past Ten Years, with the Dates of the greatest number in Port at one time each year.*



HARBOUR OFFICE, 2nd January, 1880.

PORT OF MONTREAL.

Comparative Statement showing the Number, Tonnage and Classification of Sea-going Vessels that arrived in Port the past Ten Years, with the Dates of the greatest number in Port at one time each year.

Years.	Steamships.	Tonnage.	Ships.	Tonnage.	Barques.	Tonnage.	Brigs.	Tonnage.	Brigantines.	Tonnage.	Schooners.	Tonnage.	Total No. of Vessels.	Total Tonnage.	Greatest Number in Port at one time.
1870.	144	133,912	78	73,175	157	75,797	16	4183	62	10,351	223	19,428	680	316,846	62.....June 20.
1871.	142	146,327	99	92,502	170	82,363	26	6539	47	7,339	180	15,551	664	351,721	89.....Oct. 27.
1872.	215	217,713	67	62,775	182	87,199	20	5221	68	11,504	175	14,388	727	398,800	84.....Oct. 30.
1873.	242	245,237	72	65,823	164	75,594	18	4660	59	8,581	147	12,583	702	412,478	84.....Aug. 28.
1874.	266	262,096	50	46,938	167	80,677	15	3928	64	10,688	169	19,096	731	423,423	76.....July 6.
1875.	256	255,435	40	39,895	138	63,167	17	3833	53	9,801	138	13,981	642	386,112	60.....Aug. 18.
1876.	240	262,829	40	37,303	146	66,002	18	4700	35	5,848	123	14,498	602	391,180	61.....July 24.
1877.	247	261,764	41	41,904	108	55,909	10	2560	25	4,987	78	8,735	513	376,859	59.....Oct. 19.
1878.	207	269,878	44	47,577	113	58,711	9	2610	34	6,537	109	11,953	516	397,266	45.....June 3.
1879.	289	378,353	33	38,412	121	65,223	5	1404	37	8,560	127	15,017	612	506,969	49.....Aug. 13.

A. M. RUDOLF, Harbour Master.

HARBOUR OFFICE, 2nd January, 1880.

REPORT  
OF THE  
SUPERINTENDENT OF PILOTS.

JOS. LEVEILLÉ, *Superintendent of Pilots.*

HARBOUR COMMISSIONERS OF MONTREAL,  
Office of Superintendent of Pilots,  
MONTREAL, 24th January, 1880.

H. D. WHITNEY, ESQ.,  
*Secretary,*  
*Harbour Commissioners of Montreal.*

SIR,

I have the honour to submit the following as my annual report for 1879 :

During the season, I made, altogether, 13 trips, employing the "John Pratt" 60 days and the "John Young" six days for taking up the buoys. I shall confine myself to speaking of the first and last trips, as they are the most important, the others being for the purpose of keeping the buoys in good order.

At the close of navigation in 1878, there were left in position 58 wooden buoys, and 12 iron ones, the greater

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part of which were in Lake St. Peter. Of the former, only 19 were actually lost, but most of them were so much damaged by the action of the ice that they had to be renewed. Of the iron buoys, only two were carried away. I therefore had to put down, last spring, 115 wooden and 10 iron buoys, besides 18 barrels.

During the summer I found several of the wooden buoys which had been carried away by the ice, and one iron one—owing to want of time, I did not get the other.

At various times during the season, 11 buoys were dragged off by rafts or barges, so that I had to make several trips to replace or renew them, as well as to mark dangerous places: which grow more numerous as the water falls. A great many buoys had also become water-logged and had to be replaced by drier ones.

At another time I found four iron buoys with their anchors and chains, which had been lying at the bottom for some years.

A buoy painted in squares was put in Lake St Peter, to indicate a favorable place for anchoring.

Towards the latter part of the season "balises" were put on the buoys, to make them more conspicuous.

I commenced to take up the buoys on the 24th November, beginning in the Harbour. On the 27th those in the Lake were taken up, and on the 29th those further down. One day was spent in getting off the SS. "Bellona," then aground in the Lake. I was therefore unable to take up as many buoys as I should have wished, for fear of being blocked up by the ice—however, the more exposed and costly ones have been raised.

The beacons are all in good order. They now number 26.

There are enough buoys, as well as anchors, &c., in the Ship yard at Sorel, for next year's use.

The following statement shows the number of wooden

buoys and barrels which have been left in place for the winter, as well as those taken up :

	WOODEN BUOYS.		BARRELS (All taken Up.)
	Raised.	Left.	
In the Harbour.....	8		
Montreal to Sorel.....	48		20
Sorel to Three Rivers.....	34	12	
Below Three Rivers.....	12	19	
Total.....	102	31	20

Besides these, there are 14 iron buoys, which are never taken up.

I have the honour to be, Sir,

Your most obedient servant,

(Signed.) JOSEPH LEVEILLÉ,

*Superintendent of Pilots.*

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SIR,

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REPORT  
UPON THE  
DEEPENING OF THE SHIP CHANNEL

Between Montreal and Quebec

FOR THE YEAR 1879.

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JOHN KENNEDY, M. Inst. C.E., *Chief Engineer.*

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HARBOUR COMMISSIONERS OF MONTREAL,  
Chief Engineer's Office,  
MONTREAL, 11th February, 1880.

H. D. WHITNEY, Esq.,  
*Secretary.*

SIR,

I beg to submit, for the information of the Harbour Commissioners, the following report upon the work accomplished during the year 1879 in deepening the Ship Channel between Montreal and Quebec.

At the close of navigation in 1878 the dredging, as a whole, had just been carried to a depth of  $22\frac{1}{2}$  feet at ordinary low water, and the Ship Channel opened for use for a draught of 22 feet. At a few points, such as Pointe aux Trembles and Varennes, a considerable extent had been dredged to 25 feet depth; but on the other hand, the cutting in the rock shoals had not been carried to  $22\frac{1}{2}$  feet, and vessels of that draught could only pass in autumn by taking advantage of the best tides.

It had already been determined by the Board to continue the deepening of the Channel to 25 feet at low water, and the work which therefore remained to be done, and which was entered upon at the beginning of the past summer, was practically equivalent to a new step of  $2\frac{1}{2}$

feet deeper throughout the whole extent of the Lake and River Channel, which had been dredged over at previous stages in the history of the deepening, and amounting in all to 30 miles in length.

The work has been prosecuted throughout the summer with the same plant as in the previous year, and at all the principal points at which dredging is required, but something over half the working force has been concentrated on the rock and boulder clay dredging below Lake St. Peter, for this, though small in area, is really the most formidable part of the work yet to be done.

At the close of the summer the general condition of the different parts of the Channel may be briefly described as follows:—

*Cap Charles.*—The shale rock of the Grondine Shoal is cut through to 21 feet at low water and about one-fifth of the area again cut through to 23 feet 3 inches.

*Cap La Roche Shoal*, also shale, is cut through 150 feet wide, or half the ultimate width, to 19 feet 6 inches at low water, and the other half is nearly completed to the same depth.

*At Levrant* the greater part is finished to 25 feet deep.

*At Champlain and Champlain Point* nearly the whole area is also finished to 25 feet.

*At Becancour and Point St. Francis* some shoals of small extent, but of very difficult dredging, are yet to be cut away.

*In Lake St. Peter* nearly one-fourth of the whole extent is finished to 25 feet.

*In the new Contrecoeur Channel* about one-third is finished to 25 feet.

*Between Contrecoeur and Varennes* several small shoals require dredging.

*At Pointe aux Trembles* about half the area is finished to 25 feet.

*In the Harbour of Montreal* the Channel requires to be

tested, and removed.

The total cost, which \$7,000,000 was drawn from the \$135,518,700 fleet, comprised lifters, which include re-salaries, including of the

The total yards, and cubic yard allowance

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Year
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tested, and the irregularities left by the spoon dredges removed.

The total cost of the year's work is \$143,354.17, of which \$7,835.44 is the cost of working spoon dredges drawn from the Montreal Harbour Works, and the balance, \$135,518.73 is the cost of working the usual Ship Channel fleet, composed of eight elevator dredges and two stone lifters, with their tenders. These amounts, as usual, include repairs of all kinds, fitting out, fuel, stores, wages, salaries, insurance, and all expenses incident to the working of the dredging fleet except interest and depreciation.

The total quantity of dredging done is 843,210 cubic yards, and the average cost will, therefore, be 17 cents per cubic yard, scow measurement, after deducting the usual allowance of 25 per cent. for imperfect filling.

The similar items for previous years are as follows:—

Years.	No. of Dredges.	Quantity Dredged, cubic yds.	Total cost	Average cost per cubic yard.
1875	7 to 8	820,773	\$134,744	16 $\frac{1}{10}$ cents
1876	8	922,808	130,744	14 $\frac{1}{10}$ "
1877	8 to 9	1,262,308	137,830	10 $\frac{8}{10}$ "
1878	8 elevators . . . .	966,973	\$124,891	12 $\frac{9}{10}$ " }
	1 to 3 spoons . .	117,663	24,125	20 $\frac{5}{10}$ " }
		1,084,636	\$149,016	13 $\frac{8}{10}$ " }
1879	8 elevators . . . .	813,391	\$135,519	16 $\frac{66}{100}$ " }
	2 to 5 spoons . .	29,819	7,835	26 $\frac{26}{100}$ " }
		843,210	\$143,354	17 "

It will be observed, on comparing 1879 with preceding years, that the gross cost, though not the largest, is above the average, while the quantity dredged is considerably below. The increase in expenditure occurs entirely in the item of repairs to the dredging plant rendered necessary by the continuation of the deepening to 25 feet. After the continuation was determined upon, in the fall of 1878, it will be remembered that the Board sanctioned the alteration and fitting out of two of the dredges with new sets of large buckets adapted to the soft clay of Lake St. Peter and elsewhere, with a view to shortening the time for the completion of the work, as well as reducing the ultimate cost; but the first cost of the change, amounting to \$16,628, falls to this year and is included in ordinary repairs. In addition to this, one of the other dredges, which, from the increased capacity of the Lake dredges, was released for work elsewhere, was appropriated to the rock dredging at Cap la Roche, and the buckets were suitably altered and armed with steel teeth. All the other dredges and vessels of the fleet were also more thoroughly overhauled than for the past year or two, and put in good order for the extended service. The difference between the cost of repairs actually done and what might have been done under ordinary circumstances, can, of course, only be estimated, but the unusual repairs and special alterations may be taken in the aggregate at about \$18,000, which, if deducted from the year's expenditure, would reduce it to \$125,354, or rather below the average of other years.

The reduced quantity of dredging, as measured by the number of cubic yards raised, is accounted for by the relative character of the materials in which the year's work was done. Five out of the eight elevator dredges were employed during the whole of the good weather in the rock and boulder clay below Lake St. Peter, leaving only two dredges in the soft clay of the Lake, and the old No. 1 at unfavorable points above, while in former years

the strength larger, and reversed.

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*Cap la Roche* rock of G occasional weather 3 inches d end of the distance c season, 1 \$13,984.42

*Cap la Roche* had in the feet depth about in c remained stone-lifte it so that and 150 f of loose sh of the solid vigor, par not until ed. The navigation water, and

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the strength of plant in soft digging has been decidedly larger, and in some cases the proportion has been quite reversed.

The details of the work accomplished and the cost of the same at the different localities are as follows :—

*Cap Charles.*—The work of cutting through the shale rock of Grondine Shoal was carried on with one dredge, occasionally assisted by a stone-lifter, until the stormy weather of autumn. A new cut 150 feet wide to 23 feet 3 inches depth at low water was commenced at the lower end of the south half of the Channel, and continued up a distance of 500 feet. Total quantity raised during the season, 17,502 cubic yards shale and boulders, costing \$13,984.42 or 80 cents per cubic yard.

*Cap la Roche.*—The south half breadth of the Channel had in the previous year been cut through the rock to 20 feet depth, but many boulders, which had been rolled about in dredging and left on the margin of the shoal, remained to be lifted. Much time, both of the dredges and stone-lifters, was therefore taken up in thoroughly clearing it so that over the whole area of nearly a mile in length and 150 feet wide, there should not be a boulder or piece of loose shale over 6 inches in height, above the surface of the solid rock. Work was prosecuted with the utmost vigor, part of plant working night and day, but it was not until 12th November, that this was fully accomplished. The south half of the Channel was then opened for navigation to 19 feet 6 inches draught in autumn low water, and with the tide out.

On the north half, about 1000 feet in length, which remained to be dredged from 1878, was cut through to 20 feet at low water, and a second cut to 22 feet and 800 feet in length is also taken out.

A second cut to the same depth and 400 feet in length has also been taken out of the south side.

Two dredges were employed on the work till 14th and 17th November, one stone-lifter was employed very

nearly the same time and another rendered frequent assistance. The total quantity raised was 22,110 cubic yards shale and 1485 cubic yards boulders costing in all \$31,025.64 or an average of \$1.31 per cubic yard.

*Cap Levrant or St. Anne's Shoal.*—Two dredges were employed in the early part of the season and one for the remainder, and occasional assistance was also rendered by the stone-lifters. Various parts of the shoal were worked upon and the whole is now completed to 25 feet in depth except about 700 feet in length by 150 feet width together with any points which may yet be found on testing. The dredging is still very difficult and irregular, consisting in part of very tough clay and boulders and in part of merely boulders and tops of small stony shoals.

Total quantity raised 33,856 cubic yards, costing \$17,172.83 or 50 $\frac{3}{4}$  cents per cubic yard.

*Champlain Point and Champlain Village.*—In the early part of the season the sandy shoal at the former place was finished to 24 feet deep, and the dredge was then taken up to the latter where it worked till 29th October, and finished something over three fourths of the whole to 25 feet depth at low water. The dredging at Champlain Pt. (or Pte. Citrouille) is of course sand, and at the Village it is of very tough clay with many boulders.

Total quantity raised 3127 cubic yards sand, and 15,155 cubic yards of boulder clay, making a total of 18,282 cubic yards, costing \$9,567.32 or an average 52 $\frac{3}{8}$  cents per cubic yard.

*Port St. Francis.*—A dredge was placed upon the Force Shoal at the opening of the season and worked during the time of high water, but owing to the difficult character of the dredging—consisting of tough clay and boulders—and also to a mishap to the dredge, the work accomplished was small and costly. The depth made was 23 feet at low water, the quantity dredged was 1635 cubic yards at a cost of \$1608 or 98 $\frac{1}{2}$  cents per cubic yard.

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*Pte. du Lac, or Nicolet Traverse.*—A spoon dredge from the Montreal Harbour was employed during the good weather in midsummer and cut the south half breadth of the Channel 25 feet deep through a small detached shoal north of the English Bank. Quantity raised 7,680 cubic yards costing \$1734.70 or 22<sup>5</sup>/<sub>100</sub> cents per cubic yard.

*Lake St. Peter.*—Two dredges were started, one on the 3rd June and the other on 5th June to make 25 feet depth at low water from No. 3 Light Vessel upward and by the 21st October, when they were moved to Contre-cœur they had completed a distance of 4<sup>1</sup>/<sub>2</sub> miles or to within about 2<sup>1</sup>/<sub>2</sub> miles of the White Buoy. The bottom of the new cut is some 6 to 18 inches below the general bottom of the Lower or Yamachiche Pool, and for the first time in the Lake St. Peter deepening it therefore became necessary to dredge through its entire length of 1<sup>1</sup>/<sub>2</sub> miles. Much delay and some damage was caused to the dredges in working over the original bottom from its being strewn with sunken logs and oak timber and occasional old anchors and chains and ships' ballast, the latter doubtless having been thrown out by vessels preparing to cross the Flats in former times.

The quantity of dredging done by the two dredges is 540,960 cubic yards, giving an average of 2254 cubic yards per dredge per day.

The cost of altering the dredges which worked on the Lake and furnishing them with new sets of large buckets, as already stated, was \$16,628.29, but of this an estimated amount of \$1000 was saved in ordinary repairs leaving \$15,628.29 as the net cost of the alteration. This might fairly be charged as capital expenditure in providing plant, or might be divided over the three years work in which it is expected to be used, but following the ordinary custom in the Commissioners' accounts the whole cost has been treated as for ordinary repairs and charged against the year's work in which it occurs. Made up in this latter way the cost of the 540,960 cubic yards dredged



in the Lake this year is \$33,945 or 6 $\frac{3}{4}$  cents per cubic yard. Had the alteration been charged over three years, the cost would have been 4 $\frac{3}{4}$  cents per cubic yard; and had it been charged to capital, the rate would have been reduced to 3 $\frac{7}{10}$  cents per cubic yard.

*Contrecoeur Channel.*—On the setting in of rough weather in the fall the dredges from Lake St. Peter and some of those from places below were, as usual, placed at Contrecoeur to continue the deepening to 25 feet, and by the close of the season they had extended the deepened part to about one third of the whole. Quantity raised 117,366 cubic yards, costing \$12,596 or an average of 10 $\frac{3}{4}$  cents per cubic yard, including as in the case of Lake St. Peter, the cost of altering the two large bucket dredges for the proportion of work done by them.

*Pte. Marie.*—The former dredging was this summer widened out to the full intended breadth and to a depth of 25 feet at low water, but both the dredged part and the immediate vicinity yet require to be tested to see that no small obstructions remain. Quantity dredged 44,040 cubic yards at a cost of \$7460 or 17 cents per cubic yard.

*Cap St. Michel.*—One of the dredges brought up from the lower part of the River late in the fall was set to remove an obstruction at the bend of the Channel immediately below the Cape, but had not completed it when the winter set in. Quantity dredged 2535 cubic yards, costing \$893.43 or 35 $\frac{1}{4}$  cents per cubic yard.

*Varennues.*—In the early part of the summer small areas which remained unfinished from the previous year were dredged off and the whole channel in the vicinity completed to 25 feet at low water with the exception of any points which may yet be found on more thoroughly testing it. Quantity dredged 6165 cubic yards, costing \$2234 or 36 $\frac{1}{4}$  cents per cubic yard.

*Pointe aux Trembles.*—Two of the dredges which were moved up from Champlain and Cap Charles late in the

fall were deepening the season 2355 cubic yards, cost yards.

*Montre Channel* Mary's Channel opposite and point were re of 25 feet Channel costing \$

The v numbers sels :—

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One 1  
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Further appended No. in dry do the two



fall were placed at Pointe aux Trembles to continue the deepening to 25 feet and they worked until the close of the season. Quantity raised 5100 cubic yards clay and 2355 cubic yards mixed earth and shale, total 7455 cubic yards, costing \$5192 or an average of 69½ cents per cubic yards.

*Montreal Harbour.*— At various parts of the Ship Channel through the Harbour between the head of St. Mary's Current and the Lachine Canal, but chiefly opposite and above the Island Wharf (sec. 15) small shoals and points which remained from the previous year's work were removed by the Harbour spoon dredges to a depth of 25 feet at low water and the cost charged to the Ship Channel work. Quantity dredged 22,139 cubic yards, costing \$6101 or 27½ cents per cubic yard.

#### DREDGING PLANT.

The working fleet was substantially the same in numbers as in 1878 and consisted of the following vessels :—

One Clyde built Elevator Dredge.....	No. 1 (old.)
One Elevator Dredge.....	No. 3 (later date.)
Four " " .....	Nos. 9, 10, 11 & 13 of 1874.
Two " " .....	Nos. 8 & 12, large buckets, of 1874.
Three Spoon Dredges, during a small portion of the season.	
One side wheel Tug.	
Seven screw Tugs.	
One Stone-Lifter, with hand gear.....	No. 1 (old.)
One " " with steam power.....	No. 2, 1878.
Five Barges (coal Tenders and smith's shops.)	
17 to 21 hopper bottom screws.	
Three flat scows.	

Further details of the various vessels are given in the appended tables.

No. 1 Dredge and one Tug were as usual wintered in dry dock in Montreal, the other dredges, five tugs, and the two stone-lifters were quartered at Sorel, and one

tug, the coal barges and scows at Chenal du Moine, during the winter 1878-9; the requisite repairs being made at the Commissioner's Yard and Shops.

Allusion has already been made to the alteration of two of the elevator dredges by the substitution of new buckets of 16½ cubic feet capacity and 5 ft. 5 ins. pitch centre to centre, for the former buckets of 4½ cubic feet capacity and 4 feet pitch, together with necessary changes in the main driving gear and other details. The alteration was made with a view to increasing their working capacity for soft dredging, and their performance has justified the step. Compared with work of the ordinary dredges their rate is as follows :—

LAKE St. PETER.	Small bucket dredges.			Large Bucket Dredges.	
	1876	1877	1878	1879	
	c. yds.	c. yds.	c. yds.	c. yds.	
General daily average of each of all the dredges for the whole season.....	1137	1692	1393	2254	} Large buckets 562 c. yds. per day over best year of small buckets.
Best daily average of any one dredge for the whole season.....	1284	1946	1667	2368	
Best daily average for a week..	2437	2695	2810	3645	
Best single day's work.....	2760	3165	3390	4680	
CONTRECCEUR CHANNEL.					
General daily averages of dredges working under similar conditions as to material and time of year :—					} Large buckets 1199 c.yds.per day over average of small buckets.
Small buckets..... 1878.	.....	.....	511		
Large buckets..... 1879.	.....	.....	.....	1710	

The rate of working for the large buckets taken over the whole season as compared with the season of the

smaller dredge in the without the val the lov Lake S Contre

The amount leaving on the

Amo mention repaired chute r new co had boi Dredge No. 10 paired. John Y and sm repaired bulwar had cyl overhau and rec all over buckets heavy s part of lips ; 12 made ; link pi

smaller buckets shows an increase of 562 cubic yards per dredge per day in Lake St. Peter, and 1199 cubic yards in the Contrecoeur Channel.\* As this was accomplished without increase in the running expenses of the dredges the value of the increased work of the past year taken at the lowest rates will be—

Lake St. Peter—240 days	×	562 c. yds.	×	5½ cts.	\$ 7194
Contrecoeur Ch—60 “	×	1199 “	×	10¾ “	\$ 7733
					<u>\$14927</u>

The cost of the alteration after deducting an estimated amount of \$1000 saved in ordinary repairs was \$15,628, leaving a balance of only \$700 unpaid for by the saving on the single summer's working.

Amongst the ordinary repairs to the fleet may be mentioned the following:—Dredge No. 3 had boilers repaired, tumbler bars refitted, pitch chain renewed, chute repaired, chute pump (from No. 12 dredge) put in, new covering board and part new deck; Dredge No. 8 had boilers repaired, chute and smoke stacks repaired; Dredge No. 9 had boilers and chute repaired; Dredge No. 10 had chute repaired; Dredge 13 had boilers repaired, chutes rebuilt, and bucket frame repaired. Steamer John Young had boilers repaired; Tug St. John, boiler and smoke stacks repaired; Tug M. F. Parsons had boiler repaired, and received new sheer strake, new deck, new bulwark, new stancheons, and new ribbons; Tug Delisle had cylinder bored, new piston and rod made, and engine overhauled generally; Stone-lifter No. 1 was hauled out, and received new stern post, part new deck, and caulking all over; one tumbler was built for small buckets; 260 buckets were repaired including 40 altered and fitted with heavy steel lips and teeth for rock dredging, and a large part of the remainder were re-riveted and fitted with steel lips; 124 new intermediate links for small buckets were made; 1217 links were forged or repaired; 1002 new link pins were made, and 1098 re-forged.

During summer, the bucket frames of Dredges 8 and 13 were repaired, Dredge No. 3 was docked, and the planking below water repaired and caulked where necessary; Dredge No. 13 was docked and caulked below water; the Tugs John Brown, M. F. Parsons, and St. John were docked for slight repairs and caulking; barges Caroline, Dreadnought and Henry Thomas, were hauled out and caulked; and 20 scows were hauled out for caulking and repairs.

The ice cleared off the River Richelieu, at Sorel, on 21st April, and from Chenal du Moine, on 27th April, and the vessels, with the exception of Dredges No. 1, 8, and 12, were sent to their stations as soon afterward as the floating ice on the St. Lawrence permitted. The old Dredge No. 1 was unable to work until 21st June, when the high water had subsided sufficiently to allow her buckets to reach to bottom. Nos. 8 and 12 were detained by the alterations of their buckets till the 5th and 3rd June, but all the others, commenced work, between the 7th and 12th of May. Dredge No. 1 was taken into winter quarters on November 20th, and the others were taken in on the 24 and 25th November, thus making terms of service, ranging from 131 to 182 days, and averaging 162 days as against 202 in 1878.

The spoon dredges drawn from the Montreal Harbour plant for the Ship Channel, worked at intervals as required, and rendered an aggregate of 129 days service.

The gross time of service of the eight regular Ship Channel dredges, from the time of leaving winter quarters, until returning, was 1299 days, or an average of 162 days each, and the time of actual dredging, after deducting delays and stoppages of every kind, was 9304 hours, or a general average of 7 $\frac{1}{2}$  hours per dredge per day, throughout the working season.

The nominal time of working was as usual, twelve hours in summer, and gradually reducing to nine hours in the short days of autumn.

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The details of the work of each dredge will be found in the appended tables.

#### BUOYS, BEACONS AND LIGHTING.

The place of the steamer *Richelieu* in the maintenance of the Buoys, was, this year, taken by the twin screw tug, *John Pratt*, accompanied by a flat scow, mounted with a crane, but in other respects, the service was performed by the Superintendent of Pilots in the usual manner.

The old low beacon, marking out the former line of the Ship Channel at Champlain, was blown down late in the autumn, but as it is no longer required, it was not re-erected.

On the representation of the Harbour Commissioners, that certain changes in the Lights were desirable, in order to conform to the improvements in the Channel, the Government erected new temporary lights on the proper ranges, instead of the old ones at the head of *Ile Ste. Thérèse* and at Champlain Village. The low light at Port St. Francis was moved so as to bear 150 feet further to the south at the Iron Shoal, and temporary lights were put above Grondine Village ranging on the new line of Channel between Cap la Roche and Levraut, the old light being also allowed to remain for the present.

#### LOW WATER.

The level of the St. Lawrence from Montreal to tide water was remarkably low last autumn, lower, it is generally believed, than ever before known, and certainly lower than ever before recorded at the foot of the Lachine Canal in gaugings extending back to 1852.

During mid-summer, the water in the Harbour, was scarcely lower than usual, and throughout September and the first twelve days of October, it still kept between an

inch above and 4 inches below 17 feet on the sill of the old lower lock in the Canal—which is taken as ordinary low water—and there then appeared no reason to look for unusually low water before the close of navigation. Lake Ontario, though quite below the average level, was yet the same as at the same date in 1875, and 8 inches higher than in 1872, while the River Ottawa, at Ottawa City, was still a foot higher than frequently occurs at that date, and 2 feet higher than at the same time in 1870.

Lake Ontario and, of course, the other great Lakes and the St. Lawrence above Lake St. Louis, continued after that date to fall at only the ordinary slow rate; but instead of the usual October rains which swell the Ottawa, Richelieu, St Maurice, and other tributaries, and make up to the lower St. Lawrence for the falling of the Lakes, it will be remembered that the rain-fall in autumn was exceedingly light, and the small rivers continued to fall till quite below ordinary midsummer level. Lake Ontario and the Ottawa River both continued to fall until the 8th of November, after which the Lake remained stationary and the Ottawa River began to rise, and gained a foot by the time the ice took. The St. Lawrence at Montreal was, of course, governed by the combined falling off of its supplies, and fell with much regularity from 16 feet 11 inches on the Lock Sill on October 12th, to 15 feet 5 inches on the 8th and 9th of November—the lowest recorded point—after which it rose rapidly with a succession of south and south-west winds to 17 feet on the 18th November, then fell to 16 feet 1 inch on the 1st December and afterwards rose gradually with the formation of the ice.

In Lake St. Peter the fluctuations were much the same in general, but disturbed in detail by winds and the state of the tide in the River below. At Pointe du Lac, where the fluctuations are probably greatest, the gaugings show a low point of 10 feet 4 inches on the Flats on the 9th October, rising to 11 feet 7 inches on the 18th, falling rapidly with south and south-west winds to

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9 feet 8 inches on the 27th ; again rising to 11 feet on the 30th, falling to 9 feet 9 inches for a few hours on the 3rd November, after which it again rose till the next day, when gaugings at that point were temporarily discontinued. At Sorel, however, where the gauge shows all the general fluctuations without the brief and extreme irregularities of the Lake, the water fell to a level corresponding to 9 feet 7 inches on the Flats on the 10th November, and then rose irregularly till the ice formed.

It will thus be seen that the lowest levels of Lake Ontario and of the Ottawa River at Ottawa City, and of the St. Lawrence at Montreal and the head of Lake St. Peter, all occurred between the 8th and 10th November, and that immediately the Ottawa began to rise, and doubtless the other tributaries also, the St. Lawrence followed.

It will be seen too that, if ordinary low water be taken, as it usually is, at 17 feet on the Lock Sill of the Lachine Canal at Montreal, and at 11 feet on the Flats of Lake St. Peter, the lowest water of this year, which was 15 feet 5 inches on the Lock Sill at Montreal, was 19 inches below ordinary, and in the Lake, where it was 9 feet 7 inches on the Flats, it was 17 inches below ordinary ; showing a close correspondence between the gaugings and the popular estimate.

In looking back over the gaugings of the past twenty-eight years, with a view to ascertaining the chances of a repetition of the conditions of last fall, we find that the water of November 8th and 9th was lower by 7 inches than before recorded, and also that no such previous coincidence of very low water occurred in Lake Ontario and the Ottawa since 1852, which is as far back as the gaugings at hand extend in complete form.

In 1868, which was the year of previous lowest water at Montreal, and when it fell to 16 feet on the Lock Sill on October 31st, the Ottawa River was about 8 inches higher than on November 9th, 1879, and was rising rapidly, while Lake Ontario was 5 inches higher and stationary.

In 1871, the next lowest year, when the lowest point touched at Montreal was 16 feet 1 in., and again in 1877, when it was 16 feet 2 inches, similar conditions prevailed on Lake Ontario and on the Ottawa River at the time of lowest water in both years. In 1874 and 1875 the water also fell to 16 feet 2 inches at Montreal, but the Ottawa gaugings at hand are imperfect in those years. In 1872, when Lake Ontario was exceedingly low, lower indeed in the spring than in any previous years of authentic records except 1842 and 1819, it was 1 to 8 inches lower through November of that year than in November of last fall, but the Ottawa River was then 4 to 5 feet higher than in last November, and did not allow the water at Montreal to fall below 16 feet 4 inches on the Sill.

The following are the years since 1852 in which the water fell below 16 ft. 6 ins. on the Lock Sill at Montreal :

YEAR.	Lowest water at Montreal.	Fluctuation during low water	
	Depth on old Lower Lock sill of the Lachine Canal.	at Montreal.	
	ft. in.	ft. in.	ft. in.
1865..	{ Oct. 29.....16.4 Nov. 30.....16.3	16.4 to 16. 8	from Oct. 28 to Nov. 2. & from Nov. 24 to Nov. 30.
1867..	Nov. 22.....16.5	16.5 to 16. 8	from Nov. 20 to Nov. 29.
1868..	Oct. 31.....16.0	16.0 to 16.10	from Oct. 3 to Nov. 10.
1871..	Nov. 11.....16.1	16.1 to 16.10	from Oct. 4 to Dec. 2.
1872..	{ Nov. 29 & 30.....16.4 Dec. 3.....16.3	16.3 to 16.9	from Nov. 22 to Dec. 15.
1874..	Nov. 5, 16, 19, 20, 30 & 1st Dec.. } 16.2	16.2 to 16. 9	from Oct. 21 to Dec. 16.
1875..	Nov. 30.....16.2	16.2 to 16. 8	from Nov. 9 to Nov. 30.
1877..	{ Sept. 24.....16.5 Oct. 28 & 29.....16.2	16.2 to 16.10	from Sept. 16 to Nov. 9.
1899..	{ Nov. 8 & 9.....15.5 Lowest recorded water.	15.5 to 16. 0	from Oct. 25 to Nov. 15. from Sept. 11 to Dec. 9.

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Without further discussion of the causes which produce low water at and below Montreal, the following points may be noted, having special reference to the depth of water in the dredged Ship Channel.

1st. That the conditions which brought about the extreme low water of last fall were exceptional; they have certainly not occurred for over a quarter of a century before, and as a mere matter of probabilities are not likely to occur again for many years.

2nd. On the other hand, since 1865 the water, at Montreal, has fallen for a day or two in 9 years out of 15 to below 16 feet 6 inches on the lock-sill, and in 5 years, since 1868, it has touched 16 feet 0 in. and 16 feet 2 in.; so that even regarding 1879 as exceptional, *average low water* of autumn should be taken at about 16 feet 6 inches on the lock-sill at Montreal, and 10 feet 6 inches on the Flats of Lake St. Peter, instead of 17 feet and 11 feet as usual; while what may be termed the *lowest water mark*, or that which may be touched for a day or two in any year of general low water may be fixed at 16 feet 0 in. on the lock-sill, and 10 feet on the Flats.

It follows from this, that the Ship Channel, which is being dredged to 25 feet with 10 feet 6 inches on the Flats, may be relied on for this depth except for a few days in years of very low water; but that these lowest stages are liable to occur precisely when deep water is most valuable to the fall fleet.

It may also be remarked in this connection that the specified depth in the Channel is the full depth of water, and that such allowance as may be deemed necessary beneath each class of vessel must, of course, be taken from it in fixing the draught.

3rd. It is evident from a comparison of the gaugings of Lake Ontario, the Ottawa River and the St. Lawrence at Montreal, for a series of years, that low water at Montreal is directly traceable to low water above, and not to

dredging out the Ship Channel below it as is often supposed. This must indeed be also evident, when it is borne in mind that the dredging is only over a small proportion of the length of the River, and of a breadth and depth entirely insignificant, as compared to its volume, and moreover, that no material is abstracted from the River, but it is only dredged out of certain places and deposited in others alongside, or in other words, that the water way is merely altered in a slight degree, and not really enlarged.

Yours respectfully,

(Signed)            JOHN KENNEDY,  
*Chief Engineer.*

*Abstract of*

PLACES WHERE  
DREDGES  
WORKED

Cap Charles . . . . .

Cap la Roche . . . . .

Cap Levraut . . . . .

Champlain Point . . . . .

Champlain . . . . .

Port St. Francis . . . . .

Pointe du Lac . . . . .

Lake St. Peter . . . . .

Contrecoeur Cha . . . . .

Pointe Marie . . . . .

Cap St. Michel . . . . .

Varennes . . . . .

Pte-aux-Trembl . . . . .

Montreal Harbor . . . . .

Total Earth,  
Gravel, &c. . . . .

Total Rock and  
Boulders . . . . .

Gross Total . . . . .

Abstract of DREDGING done at different Places in 1879 in Deepening the SHIP  
CHANNEL between Montreal and Quebec to 25 feet.

PLACES WHERE DREDGES WORKED.	DREDGES.	Quan- tities Dredged at each place.	TOTALS.		ROCK.	REMARKS.
			Earth, &c	Earth, &c		
Cap Charles .....	Dredge No. 11.	Cub. Yds. 17,430				
	S. Lifter No. 1.	63				
	" No. 2.	9				
Cap la Roche .....	Dredge No. 9.	135			17,502	Shale, rock & boulders
	" No. 10.	12,210				
	" No. 11.	1,275				
	" No. 13.	8,490				
	S. Lifter No. 1.	319				
Cap Levrault .....	" No. 2.	1,166				
	Dredge No. 3.	2,475			23,595	Shale, rock & boulders
" No. 9.	31,080					
Champlain Point ..	S. Lifter No. 1.	94				Hard clay & boulders
	" No. 2.	207				
Champlain Point ..	Dredge No. 3.	3,105			301	Large boulders
	S. Lifter No. 1.	22				
Champlain .....	Dredge No. 3.	15,105			22	Boulders
	S. Lifter No. 2.	50				
Port St. Francis ...	Dredge No. 13.	1,635			50	Large boulders
Pointe du Lac .....	Dredge No. 7.	7,670				Hard clay & boulders
Lake St. Peter .....	Dredge No. 8.	254,364				Mixed clay & fine sand
	" No. 12.	286,596				
Contrecoeur Chan'l	Dredge No. 1.	10,620				Soft clay
	" No. 8.	56,685				
	" No. 10.	2,385				
	" No. 12.	45,936				
	" No. 13.	1,740				
Pointe Marie .....	Dredge No. 1.	44,040			117,366	Clay and stones
Cap St. Michel .....	Dredge No. 9.	2,535			44,040	Clay, with boulders
Varennnes .....	Dredge No. 1.	1,290			2,535	Clay, gravel & sand
	" No. 3.	4,875				
Pte-aux-Trembles.	Dredge No. 1.	750			6,165	Clay, gravel & sand
	" No. 3.	4,350				
Montreal Harbour.	Dredge No. 11.	2,355			5,100	Clay and some shale Hard clay and gravel
	" No. 2.	4,657				
Montreal Harbour.	" No. 4.	3,465			2,355	Shale, clay & boulders
	" No. 5.	6,120				
	" No. 6.	2,272				
	" No. 8.	5,625				
Total Earth, Gravel, &c. .... }			22,139			Sand, gravel & boulders
			799,385			
Total Rock and Boulders .....					43,825	
Gross Total .....					843,210	

*Abstract of DREDGING done by each Dredge in 1879 in Deepening the SHIP CHANNEL between Montreal and Quebec to 25 feet.*

DREDGES.	Commenc'd Working.	Stopped Working	Time of Service	PLACES AT WHICH WORK WAS DONE.	QUANTITIES DREDGED.			REMARKS.
					Earth, Gravel, &c.	Totals.	Rock.	
			<i>Days.</i>		<i>Cubic Yds.</i>	<i>Cubic Yds.</i>	<i>Cubic Yds.</i>	
Elevator Dredge No. 1	June 21	Nov'r 20	131	Contrecoeur Channel. Pointe Marie Varennnes Pointe-aux-Trembles	10,620 44,940 1,290 150	56,700		Clay and stones. Clay, with boulders. Clay, gravel and sand. Clay and some shale.
Spoon " No. 2			29	Harbour of Montreal	4,657	4,657		Sand, gravel boulders. Hard clay and boulders.
Elevator " No. 3	May 8	Nov'r 25	173	Cap Levrault Chambelin Point Chambelin Varennnes Pointe-aux-Trembles	2,475 3,105 15,105 4,875 4,350	29,910		Coarse sand and boulders. Gravel, sand, clay and boulders. Clay, gravel and sand. Hard clay and gravel.
Spoon " No. 4			30	Harbour of Montreal	3,465	3,465		Sand, gravel and boulders.
" " No. 5			36	Harbour of Montreal	6,120	6,120		Sand, gravel and boulders.
" " No. 6			18	Harbour of Montreal	2,272	2,272		Sand, gravel and boulders.
" " No. 7			53	Pointe du Lac Harbour of Montreal	7,680 5,625	13,305		Mixed clay and fine sand. Sand, gravel and boulders.
Elevator " No. 8	June 5	Nov'r 25	149	Lake St. Peter Contrecoeur Channel	254,364 56,685	311,049		Soft clay. Clay and Stones.
Elevator " No. 9	May 5	Nov'r 24	175	Cap la Roche	135	135		Shale Rock.
				Cap Levrault Cap St. Michel	31,080 2,535	33,615		Hard clay and boulders. Clay, gravel and sand.
<i>Carried forward</i>						461,693	135	

*Abstract of DREDGING done by each Dredge in 1879 in Deepening the SHIP CHANNEL between Montreal and Quebec to 25 feet.—(Continued.)*

DREDGES.	Commenc'd Working	Stopped Working	Time of Service	PLACES AT WHICH WORK WAS DONE.	QUANTITIES DREDGED.
			<i>Days.</i>		<i>Cubic Yds.</i>



*Abstract of DREDGING done by each Dredge in 1879 in Deepening the SHIP CHANNEL between Montreal and Quebec to 25 feet. — (Continued.)*

DREDGES.	Commenc'd Working.	Stopped Working.	Time of Service	PLACES AT WHICH WORK WAS DONE.	QUANTITIES DREDGED.				REMARKS.
					Earth, Gravel, &c.	Totals.	Rock.		
<i>Brought forward.</i>									
Elevator Dredge No. 10.....	May 12.....	Nov'r 24..	Days. 169	Cap la Roche..... Contrecoeur Channel.....	Cubic Yds. 12,210	Cubic Yds. 461,093	Cubic Yds. 135 12,210	Shale, rock and boulders. Clay and stones.	
Elevator " No. 11.....	May 5.....	Nov'r 25..	182	Cap Charles..... Cap la Roche..... Pointe-aux-Trembles.....	2,385 17,430 1,275 2,335	2,385		Shale, rock and boulders, Shale, rock and boulders, Shale, clay and boulders.	
Elevator " No. 12.....	June 3.....	Nov'r 25..	151	Lake St. Peter..... Contrecoeur Channel.....	286,566 45,366	332,532	21,060	Soft clay. Clay and Stones.	
Elevator " No. 13.....	May 12.....	Nov'r 24..	169	Cap la Roche.....	8,490	8,490	8,490	Shale, rock and boulders.	
Stone Lifter No. 1.....	May 7.....	Nov'r 25..	174	Point St. Francis..... Contrecoeur Channel.....	1,635 1,740	3,375		Hard clay and boulders. Clay and stones.	
Stone Lifter No. 2.....	May 9.....	Nov'r 22..	170	Cap Charles..... Cap la Roche..... Cap Levrault..... Champlain.....	63 319 94 22		498	Large boulders. Do. do. Do. do. Do. do.	
				Cap Charles..... Cap la Roche..... Cap Levrault..... Champlain.....	9 1,166 207 50			Large boulders. Do. do. Do. do. Do. do.	
Total earth, gravel, &c.....						796,385	1,432		
Total rock and boulders.....							43,825		
<b>GROSS TOTAL.....</b>							<b>843,210</b>		

**DREDGING PLANT employed in Deepening the SHIP CHANNEL between Montreal and Quebec in 1879.**

DESCRIPTION OF VESSEL.		HULL.				ENGINES.				REMARKS.				
DREDGES.	No.	Length over all.	Breadth of Beam.	Depth of Hold.	When Built.	Tonnage Register.	Kind of Engines.	No. of Cylinders.	Diameter of Cylinder.	Length of Stroke.	Pressure of Steam.	Capacity of Bucket.	Depth to which work.	Remarks.
Elevator Dredge	No. 1.	130 0	27 0	9 0	1832	103.32	Side lever condensing	1	27	30	5 to 7	4	24	Wooden Hull, rebuilt in 1859.
"	No. 3.	135 0	29 0	10 0	1874	22.42	Two coupled vertical direct acting condensing engines to each dredge.	2	16	48	20 to 25	4	25	Wooden Hull.
"	No. 8.	135 0	29 0	10 0	1874	37.43		2	20	32	35 to 60	16	35	"
"	No. 9.	135 0	29 0	10 0	1874	37.43		2	20	32	35 to 60	4	35	"
"	No. 10.	135 0	29 0	10 0	1874	21.41		2	20	32	35 to 60	4	35	"
"	No. 11.	135 0	29 0	10 0	1874	17.07	engines.	2	20	32	35 to 60	16	35	"
"	No. 12.	135 0	29 0	10 0	1874	28.09		2	20	32	35 to 60	16	35	"
"	No. 13.	135 0	29 0	10 0	1874	54.37	engines.	2	20	32	35 to 60	4	35	"
"	No. 14.	135 0	29 0	10 0	1874	103.32		2	20	32	35 to 60	4	35	"
<b>STREAMERS AND TUGS.</b>														
John Young	.....	125 0	22 0	8 1	1875	103.32	Independent beam	2	30	96	45 to 50	.....	.....	Wooden Hull.
M. F. Parsons	.....	76 0	15 0	6 6	1864	22.42	Direct acting non-condensing engines.	1	18 1/2	30	80 to 90	.....	.....	"
St. Francis	.....	80 0	17 0	7 9	1875	37.43		1	20	32	80 to 87	.....	.....	"
St. John	.....	80 0	17 0	7 3	1875	37.43	engines.	1	20	22	80 to 87	.....	.....	"
John Pratt	.....	96 5	19 2	7 5	1874	21.41		1	14	16	16	70 to 80	.....	.....
Delisle	.....	62 5	14 9	7 5	1869	17.07	Vertical non-condensing.	2	18	20	80 to 90	.....	.....	"
John Brown	.....	76 0	15 0	7 0	1837	28.09		1	18	20	30 to 70	.....	.....	"
St. James	.....	76 0	17 0	8 2	1875	54.37	1	16	20	70 to 80	.....	.....	"	
<b>BARGES.</b>														
Waverley	.....	110 0	29 11	7 1	1870	176.00	Steam Winches Capacity of each Scow. Cubic Yards.	.....	.....	.....	.....	.....	.....	Wooden Hull.
Breadnought	.....	104 2	21 5	7 4	1869	136.42		.....	.....	.....	.....	.....	.....	"
Henry Thomas	.....	100 8	22 9	7 7	1865	143.40		.....	.....	.....	.....	.....	.....	"
Hope	.....	100 0	20 0	6 0	1864	98.00		.....	.....	.....	.....	.....	.....	"
Carroll	.....	103 8	22 6	6 5	1872	132.95	.....	.....	.....	.....	.....	.....	"	
Stone Lifter	No. 1	75 0	22 0	6 0	1858	.....	.....	.....	.....	.....	.....	.....	.....	"
"	No. 2	75 0	24 0	7 9	1873	.....	.....	.....	.....	.....	.....	.....	.....	"
<b>SCOWS.</b>														
2 Hopper-bottomed	.....	80 0	16 0	7 0	1870	30 & 31	Hoppers	.....	.....	.....	.....	.....	.....	3 Hoppers
13 "	.....	80 0	16 0	6 9	1874	22 to 46		.....	.....	.....	.....	.....	.....	4 "
2 "	.....	54 6	18 0	7 0	1875	47 & 48		.....	.....	.....	.....	.....	.....	2 "
2 "	.....	58 0	19 9	7 3	1876	49 & 50	.....	.....	.....	.....	.....	.....	.....	All Wood.
2 "	.....	89 0	18 0	7 9	1879	51 & 52	.....	.....	.....	.....	.....	.....	.....	"
3 Flat Scows	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	Borrowed from the Harbour Works.

NOTE.—Different Spoon Dredges belonging to the Montreal Harbour Works were, in addition to the above, temporarily employed upon the Ship Channel.

**PILOT**

W. M. SMITH  
Deputy

SIR,  
I have the honor to acknowledge the receipt of your letter of the 10th inst. in relation to the application of the Montreal Fishery Commission. An examination of the Commission of Gauthier, Gauthier, licensed as per the report of the Commission. In accordance with the provisions of the Act, I have the honor to issue to you the licenses to pilot during the season. The following are the names of the pilots, each pilot,

REPORT  
OF THE  
PILOTAGE DISTRICT OF MONTREAL  
FOR THE YEAR 1879.

HARBOUR COMMISSIONERS OF MONTREAL,

Secretary's Office,

MONTREAL, 10th January, 1880.

WM. SMITH, ESQ.,

*Deputy Minister of Marine and Fisheries,*  
Ottawa.

SIR,

I have the honor, by direction of the Harbour Commissioners of Montreal, to submit herewith, for the information of the Honorable the Minister of Marine and Fisheries, the annual report of the Pilotage District of Montreal, for the year ended the 31st December 1879:—

An examination of apprentice pilots was held by the Commissioners on the 4th, 5th and 6th ult., and Laurent Gauthier, Jean Arcand, Deloivoie Naud, and Wilbrod Gauthier, having been found competent, were duly licensed as Branch Pilots.

In accordance with the 36th Section of the Act 36 Vic. Cap. 54, Pilots Onesime Naud, the elder, aged 75, and Joseph Barnabé *dit* Lafreniere, aged 66, were granted licenses to pilot for one year.

I have to report that there were no deaths among the pilots during the year.

The following is a list giving the name and age of each pilot, for and above the Harbour of Quebec, acting

under the authority of this Commission, with the earnings of each during the season of navigation of 1879 :—

No.	NAME.	AGE.	EARNINGS.	REMARKS.
1	Onesime Naud (elder)...	75	\$625 66	
2	P. M. Mathieu.....	59	937 88	
3	F. A. Mayrand.....	59	666 69	
4	Joseph Leveillé.....	61	.....	Supt. of Pilots.
5	Hector Hamelin.....	61	664 88	
6	Zepherin Bouillie.....	50	1,422 55	
7	P. Gaillardet.....	63	573 55	
8	Jos. Barnabé dit Lafrenière	66	595 25	
9	Cyrille Belisle.....	51	661 57	
10	Adolphe Lisée.....	49	1,330 18	
11	George Raymond.....	49	1,362 22	
12	Augustin Naud.....	52	1,566 03	
13	H. A. Belisle.....	48	662 66	
14	Athanase Dufresne.....	45	1,393 47	
15	J. B. Dorval.....	47	560 64	
16	L. N. Bouillé.....	52	900 00	Pilot Str. <i>Montreal</i> .
17	Edouard Naud.....	56	171 34	
18	Pierre Gagnon.....	51	1,216 06	
19	J. George Belisle.....	39	679 03	
20	O. Naud, No. 1.....	38	1,278 20	
21	J. O. Hamelin.....	45	651 39	
22	J. Chandonnet.....	38	1,601 34	
23	Louis A. Bouillé.....	39	635 74	
24	Prudent Boudet.....	37	1,552 80	
25	Elzear Belisle.....	44	603 03	
26	Joseph Pleau.....	41	1,221 69	
27	Celestin Brunet.....	36	1,192 30	
28	Louis Belisle.....	33	1,771 96	
29	Damase Caïen.....	38	53 55	
30	Ulric Groleau.....	31	27 82	From 8th November
31	Alfred Frenett.....	39	1,021 56	
32	Alfred St. Armand.....	35	791 50	
33	Phillipe Belanger.....	40	641 55	
34	Victor Gagnon.....	40	672 29	
35	Narcisse Perrault.....	41	1,021 43	
36	Treffé Toupin.....	31	681 13	
37	Cleophas Auger.....	32	1,180 45	
38	Francois Desjordy.....	34	751 52	
39	Ferdinand Labranche....	33	1,040 07	
40	David Perrault.....	36	897 02	
41	Alexis Gauthier.....	32	936 11	
42	Louis Z. Bouillé.....	30	803 57	
43	Jos. Toupin.....	30	660 11	
44	Laurent Gauthier.....	29	.....	} Branched on 10th December, 1879.
45	Jean Arcand.....	26	.....	
46	Delovoie Nault.....	27	.....	
47	Willbrod Gauthier.....	27	.....	
			\$37,677 79	
Pilotage collected at Three Rivers.....			672 50	
Pilotage collected at Sorel.....			179 88	
Total earnings.....			\$38,530 17	

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The above amount was received from the following sources, viz. :—

## BRITISH :

Steamships.....	\$25,187 17	
Sailing Vessels.....	10,692 75	
		<u>\$35,879 92</u>

## FOREIGN :

Steamships.....	\$ 198 75	
Sailing Vessels.....	2,451 50	
		<u>\$ 2,650 25</u>

Grand Total..... \$38,530 17

The following list shows the name and age of each Apprentice serving his time under the authority of this Trust :—

No.	NAME.	AGE.
1	Leon Croteau.....	40
2	Alphonse Cossette.....	31
3	Norbert Arcand.....	27
4	Ulric Toupin.....	25
5	Nestor Arcand.....	23
6	Gedeon Groleau.....	27
7	Néré Belisle.....	27
8	Louis Mayrand.....	22
9	Hubert Perrault.....	30
10	Tancrede Bouillé.....	25
11	Odilon Portelance.....	26
12	Leboire Perrault.....	30
13	John Naud.....	24
14	Joseph Hurteau.....	19
15	Wilfred Raymond.....	25
16	Adolphe Richard.....	31
17	George Dufresne.....	28
18	Joseph Langlois.....	24
19	Edouard Perrault.....	29
20	Lyderic Bouillé.....	22
21	Elie Bouillé.....	20
22	N. Edson Angers.....	29
23	Honoré Dusseau.....	26
24	Joseph Dusseau.....	23
25	Narcisse Paquet.....	25

The following is an account of the various casualties that have occurred on the River during the past season :—

On the 20th June last, the SS. "Colina," when on her way up from Quebec, in charge of Pilot F. Labranche,

was run aground near Cap Charles, the vessel receiving considerable injury, and the cargo being also greatly damaged. A complaint was at once made by the captain against the pilot, and an investigation held, at which, from the evidence taken under oath, it appeared that the pilot had endeavored to pass on the wrong side of a dredge lying on the south side of the channel. He was found guilty of a want of sound judgment and skill in the management of the said steamship, and suspended from exercising his functions as a Pilot until the 1st January, 1880. The Pilot (Labranche) immediately made application to the Superior Court for a writ of *certiorari*, and in consequence of there being certain technical irregularities in the proceedings, it was thought advisable to allow the case to be withdrawn, which was done.

The SS. "Barnard Castle," while proceeding to Quebec on the 29th June, in charge of Pilot Placide Gaillardet, grounded in Lake St. Peter, owing to her not answering her helm. No complaint was made against the Pilot, and the vessel was got off without injury after being lightered.

When leaving the Harbour of Montreal on the 7th September, the SS. "Bengal," in charge of Pilot J. George Belisle, was run aground on the shoals near St. Helen's Island. The ship was not damaged, but required to lighter almost her entire cargo before she floated. An enquiry into the causes of the accident was commenced on the 16th of the same month, but was not concluded until the 12th November, owing to repeated adjournments at the request of the Pilot, to enable him to obtain further evidence in his behalf. The evidence went to show that the vessel, which was lying in the lower part of the Harbour, was turned too soon and was not properly handled. Judgment was then rendered suspending him until the 1st August, 1880. The pilot has since obtained a writ of *certiorari* in the matter, which is still before the Court.

On the morning of the 30th October, the SS. "Mildred," in charge of Pilot Hector Hamelin, went aground on the

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St. Anne's Shoal, near Cap Levraut, and received such serious damage as to oblige her being docked for repairs. The Pilot was summoned before the Commissioners, and, after a full investigation, in which it was proved that he had gone on the wrong side of the buoy at the place where the accident occurred, it was decided to suspend him until the 1st August, 1880. A writ of *certiorari* has also been obtained in this case, which has not yet been decided.

The usual arrangements were made last spring for the maintenance of the buoys in the Richelieu River, between St. Johns and Rouse's Point, and in the Rivière des Prairies.

The following is the Tariff of Pilotage now in force in the Pilotage District of Montreal:—

QUEBEC TO MONTREAL, OR VICE VERSA.	Upwards.	Downwards.
Pilotage of Vessels in tow of a Steamer, for each foot of draught of water . . . . . }	\$2.00	\$2.00
Pilotage of Vessels propelled by steam, for each foot of draught of water . . . . . }	2.50	2.50
Pilotage of Vessels under sail, for each foot of draught of water . . . . . }	4.20	2.80
Moving a Vessel from one Wharf to another in the Harbour of Montreal, or from foot of current into the Harbour . . . . . }	5.00	5.00

The amount received for poundage, being five per cent. of the earnings of the Pilots, was \$1,924.07, including that received on vessels coming only to Sorel or Three Rivers. There was besides received as interests on investments \$1,923.75, making a total of \$3,847.82. The disbursements were \$2,157.92, paid as pensions to old and infirm Pilots, and the widows of Pilots.

I have the honor to be, Sir,  
Your most obedient servant,

(Signed,)

H. D. WHITNEY,  
*Secretary.*

## AUDITORS' REPORT.

WESTERN CHAMBERS,  
22 St. John Street,  
MONTREAL, 12th February, 1880.

*To the Chairman  
of the  
Harbour Commissioners of Montreal.*

SIR,

Having audited the Books of Account of your Secretary-Treasurer for the year ending 31st December, 1879, we would beg to report thereon as follows:—

1. We first checked the Wharfinger's Cash Book, the summations of which we found correct—the items appearing therein corresponding with counterfoils of receipts issued by him for wharfages collected. We next checked the Secretary-Treasurer's Cash Book, and verified the items appearing to credit of Harbour Revenue, consisting of (1) Dues, Tolls, &c., collected by Wharfinger, and (2) by Custom House, Montreal, with Returns of such collections furnished the Secretary-Treasurer. The items of disbursement, under their various classified heads, we found properly charged and vouched.

2. We checked the Bank Accounts with the Pass Book, verifying the balances as stated in the ledger at 31st December, 1879.

3. No Debentures having been issued or paid during the year, we had simply to check the coupons maturing for that period. This we did by verifying the items in the Bank Pass Books marked "Coupons," with the various

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amounts charged to Interest Account in the Secretary-Treasurer's Cash Book.

4. Finally we examined (1) the Balance Sheet at 31st December, 1873, and (2) Statement of Receipts and Disbursements for the year, prepared by your Secretary-Treasurer, and we beg to certify that they are correctly drawn up from the books of the Trust.

We have much pleasure in again certifying to the excellent order in which the books are kept.

We have the honour to be, Sir,

Your most obedient servants,

(Signed,)

EVANS & RIDDELL,

*Auditors.*