

ANNUAL REPORTS
OF THE
HARBOUR COMMISSIONERS
OF MONTREAL
FOR THE YEAR 1884.



Commissioners :

ANDREW ROBERTSON, Esq., CHAIRMAN.

J. B. ROLLAND, Esq.

HUGH McLENNAN, Esq.

EDWARD MURPHY, Esq.

CHARLES H. GOULD, Esq.

HENRY BULMER, Esq.

HON. J. L. BEAUDRY (MAYOR.)

VICTOR HUDON, Esq.

ANDREW ALLAN, Esq.

H. D. WHITNEY, SECRETARY.



Montreal :

PUBLISHED BY ORDER OF THE HARBOUR COMMISSIONERS OF MONTREAL.
1885.

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GAZETTE PRINTING COMPANY, MONTREAL.

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MADE BY

MR. ANDREW ROBERTSON, CHAIRMAN,

OF THE

*Business of the Port for the year 1884, and other matters connected
with the Trust,*

AT THE PUBLIC MEETING OF THE BOARD, HELD ON 12TH FEBRUARY, 1885.

GENTLEMEN,—

The usual reports of the Chief Engineer and Harbour Master are hereto appended, and contain all the usual details of their respective departments. It is gratifying, considering the year we have passed through, and the general depression throughout the world, that the decrease in tonnage as well as revenue has been so small, as the following will show.

The tonnage as compared with last year, is as follows:—

	Vessels.	Tonnage.
Ocean Steamships.....1883	464	605,805
1884	444	585,397
Decrease	<u>20</u>	Decrease.. <u>20,408</u>
Ocean Sailing Vessels....1883	196	58,458
1884	182	63,977
Decrease.....	<u>14</u>	Increase.. <u>5,519</u>
Total Ocean Vessels....1883	660	664,263
1884	626	649,374
Decrease.....	<u>34</u>	Decrease.. <u>14,889</u>
Total Inland Vessels....1883	5477	764,721
1884	4808	726,605
Decrease.....	<u>669</u>	Decrease.. <u>38,116</u>
Total Ocean and Inland.1883	6137	1,428,984
1884	5434	1,375,979
Decrease.....	<u>703</u>	Decrease.. <u>53,005</u>

The foregoing when analyzed shows that Ocean Steam Tonnage has decreased a fraction over 3 per cent., while Sail has increased 9 per cent. The reduction on all Ocean vessels shows $2\frac{1}{4}$ per cent. less than 1883; Inland 5 per cent.: while both combined show $3\frac{3}{4}$ per cent. less than last year.

Income in.....	1883	\$247,813.19
	1884	\$239,602.92
		<hr/>
Decrease.....		\$ 8,210.27

or little less than $3\frac{1}{2}$ per cent.

It is very gratifying to be able to state that not only the tonnage but the income have only been between three and four per cent. less than last year.

The reduction made on grain alone during June to September came to more than the lessened income, while coal, because of railroad competition, caused a reduction of about \$3,000 more.

The prospects for the coming year, so far as we can learn, are that we may expect a considerable increase of tonnage, additional accommodation being asked for by various parties. This, coupled with the opening late last year of another outlet to the west by the completion of the Quebec and Ontario Railway, which has nearly 600 miles of rail, will no doubt considerably increase the trade of the port, while the opening in August next of the Canadian Pacific Railway from ocean to ocean on our own territory, comprising nearly 3,400 miles of track, must soon tax to a much greater extent than in the past, the accommodation we can give in the harbour of Montreal, and to meet this requirement, extensive improvements will be necessary. Personally I have felt for years past, we could not expect to bring any large share of the wheat exports of the Western States through Montreal, but now that we are about to have the shortest line from our

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great North-west, it is only reasonable to hope that every bushel which has to be shipped from that great country will, in summer, pass through the St. Lawrence route.

In this connection, one of the most pressing questions which has to be dealt with is the accommodation which will be required by railways for tracks on the wharves

There are at present two single tracks on the wharves having no connection with each other—one, extending over a portion of the harbour, worked by the Grand Trunk Railway, to whom permission to lay down tracks was granted by our predecessors in 1871, and the other, the property of the Commissioners, running along the greater portion of the wharves, and worked by the Canadian Pacific Railway.

After permission was given the Grand Trunk Railway to lay tracks, it was found advisable that all the tracks on the wharves should be the property of the Harbour Commissioners only, and be open for use by all Railways on equal terms, and efforts have for some time back and are now being made, in the interests of the harbour, to have these tracks amalgamated, so that they may be worked in common. Such an arrangement would greatly facilitate the handling of the cars on the wharves, as well as increase the capacity of the rails now laid.

One of the most important steps taken in the interest of the harbour is the lease of land made by the Commissioners to the Canadian Pacific Railway for the erection of elevators. A lease has been agreed upon for fifty years at a nominal rental, but should the land not be used for elevator purposes it is to revert to the Harbour Commissioners.

The Commissioners hope that the building of these elevators will give to the port the grain trade of our new North-west, and also insure a reasonable stock in port, especially before the canals open, which will induce more shipping to come into the harbour.

It may be well to mention here the fact that the dues on grain were reduced from 9th June to 1st September, from seven and a half cents per ton to the nominal charge of one cent per ton. This was done in consequence of the great lack of wheat and grain for deadweight, and to see if by such action it could be possible to induce the grain to come this way. Opinions are divided as to whether it had any influence or not. On the re-imposition of dues on the 1st September it was stated by the papers that considerable dissatisfaction was expressed by the grain merchants that we had broken faith in not continuing the same rate to the end of the season, as the Government were doing; but it must not be forgotten that the Government only took off half their tolls for six months, while we practically took them all off for three months, believing that this policy would be more efficacious at the moment, and believing the next harvest would bring some relief to the trade.

Another thing must not be overlooked, and that is, we are not like the Government. We have no other resources to draw from to keep up our revenue. This reduction in grain caused a loss in revenue of nearly ten thousand dollars, which can only be regained by increased business in the future.

Now take $7\frac{1}{2}$ cents, say equal to $3\frac{1}{4}$ d. sterling per ton. That same grain is subject to a charge in Glasgow of 1s. 3d. sterling, or four times as much as is charged in Montreal, and if it remains in the transit sheds it costs a shilling per ton additional for every day it remains there.

I am aware that the objection will be made that it is not with Glasgow we must compare, but with ports on this side; but my reason for taking Glasgow is, that it is managed by a Trust similar to our own, they must get income to meet the interest and ordinary expenditure as we have to do, and therefore charges have to be imposed that will cover the outlay.

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Then as to ports on this side. New York, according to some of our shipping companies who come here during the summer, and who have had practical experience there lately, which makes them think a good deal more of the port of Montreal, and who say that, so far as charges are concerned, they find Montreal more advantageous than the port of New York, not only as to cost, but to the accommodation and despatch afforded them.

The annual inspection of the channel by the Commissioners took place as usual. His Excellency the Governor-General having been invited by the Commissioners, and having graciously consented, named the 29th of August. The day was not quite so pleasant as could have been wished, but everything worthy of inspection was seen without much inconvenience, all the dredges and stone-lifters were found working in perfect order. The captains were much pleased at His Excellency's visit and his kindly greetings to them. His Excellency on reaching Quebec expressed his satisfaction with the inspection and the interesting character of the work.

Important improvements have been made by Mr. Kennedy, chief engineer, in the rock-working dredges, by which their efficiency has been increased some four-fold, and the shale-rock of Cap la Roche and Cap Charles is now dredged almost as easily as the harder kinds of clay.

At Cap la Roche a semaphore has been erected, which indicates the state of tide and shows every three inches of a rise or fall. The indications are visible some miles up and down the river, and are of much practical value, in enabling vessels to safely avail themselves of the full depth of water in the channel. Cap la Roche, at very low tides, is still somewhat the shallowest part of the ship channel, and in order to give navigation the earliest possible benefit of the dredging, the work was so arranged last summer as to run a cut of extra depth through one-half the

breadth of the new channel. This was completed for fall use, and, on 1st October, the Commissioners gave official notice that the new channel had been "deepened and tested in the north half of its breadth to $21\frac{1}{2}$ feet at lowest water, equal to $26\frac{1}{2}$ feet at a good average tide, or $1\frac{1}{2}$ feet deeper than formerly."

The Commissioners during the year brought before the notice of the Road Committee the dangerous state of the revetment wall, more particularly the portion immediately in front of this building. The Commissioners think the city should come to their relief in this matter, although it is true that the ground on which the walls stand and the pavement above it to the gutter belongs to the Commissioners, yet they are of no use to the trade of the Harbour and are only used by the citizens as a promenade. The Commissioners, therefore, do not think it unreasonable that the city should fairly be asked to maintain and keep up this promenade, not only for its use and sight-seeing to pedestrians, but for its use in keeping up Commissioners' street. Two of the Road Committee have had an interview with the Commissioners, but so far no action has been taken.

Mr. Andrew Allan's term of office as representative of the shipping interest expired on the 4th of August. He was again unanimously elected.

The Commissioners regret to state that they have had to investigate into the grounding of two vessels. On the 21st of October the steamship Lake Huron, of the Beaver Line, grounded at Point-aux-Trembles, (*en haut*), in charge of Pilot Joseph Chandonnet. The usual investigation was held; and, as it seemed that no blame could be attached to the pilot, and, as the vessel appeared not to have suffered any damage, the pilot was acquitted.

On the 22nd of October the steamship Lake Champlain, of the same line, on her way to Quebec, in charge of Pilot

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Louis Belleisle, grounded near Lavaltrie, having taken the wrong channel.

The vessel apparently sustained no special damage, but was required to lighten a large portion of her cargo, and was detained about four days. At the investigation the pilot admitted he had made a mistake, and threw himself on the mercy of the Court, but urged certain circumstances in mitigation of his conduct. In view of this, and in consideration of his previous good conduct, extending over a number of years, it was decided to suspend him from exercising his functions as pilot from the date of the accident to the 1st of July, 1885.

Three apprentice pilots, viz.: Nestor Arcand, John Nault and Joseph Dussault, who passed in March, 1883, received their branches.

The pilots between Quebec and Montreal brought a bill into Parliament to incorporate them in the same way as the Corporation of Pilots in Quebec. As the Commissioners considered the bill, if passed, would seriously interfere with the trade of the port, they opposed the same, and, after some concessions by which the Commissioners agreed not to increase the number at present on the roll, the bill was ultimately withdrawn.

New by-laws were passed during the year, having for their purpose the keeping of vessels drawing under eight feet of water in the old channel, reserving the new to those of deeper draught, which it is hoped will secure greater safety. They are as follows:

BY-LAW 153.

The exclusive use of the deep-water channels of the River St. Lawrence, in the portions of the river hereinafter mentioned and in the said statute described, is hereby restricted and appropriated to vessels drawing, when loaded to their ordinary capacity, more than eight feet of

water, and all rafts and all barges and other vessels drawing, when loaded to their ordinary capacity, eight feet of water or less than eight feet, are hereby prohibited from using the said deep-water channels in the said portions of the said river, except in case of accident, or stress of weather, or force of current.

BY-LAW 154.

The portions of the said river referred to in the foregoing by-law and in the said statute may be herein described as follows :

1. The portion of the said river near Pointe-aux-Trembles (*en haut.*)
2. The portion of the said river lying at, between and near Varennes and Pointe Marie.
3. The portion of the said river through which the channel known as the Contrecoeur channel passes.
4. The portion of the said river lying between the upper end of St. Francis bank, in Lake St. Peter, and the English bank in the same lake.
5. That portion of the said river at and near Port St. Francis.
6. The portion of the said river at, between and near Batiscan and Cap Charles.

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RECEIPTS AND EXPENDITURE
 OF THE
 HARBOUR COMMISSIONERS OF MONTREAL
 FOR THE YEAR 1884.

HARBOUR COMMISSIONERS OF MONTREAL,
Secretary's Office,
 MONTREAL, January 31, 1885.

WM. SMITH, Esq.,
Deputy Minister of Marine,
 OTTAWA.

SIR,

I have the honour, by direction of the Harbour Commissioners of Montreal, to forward herewith, for the information of the Honourable Minister of Marine, statements of the receipts and disbursements of the Trust, for the year ended 31st December, 1884.

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

FROM COLLECTOR OF CUSTOMS, MONTREAL:

Wharfage on goods—Inwards.....	\$94,900 69
“ “ —Outwards.....	52,079 75
Tonnage Dues on Steamships.....	40,412 52
“ “ Sailing Vessels.....	5,869 26
	\$193,262 22

<i>Brought forward</i>		\$193,262 22
LOCAL TRAFFIC.		
Wharfage on goods—Inwards.....	\$5,082 90	
“ “ —Outwards.....	1,058 36	
Harbour Dues on Barges.....	8,701 19	
“ “ Steamers.....	1,868 50	
Commutation on Steamers.....	12,962 00	
Received for piling Lumber on Wharves.....	1,880 00	
“ “ Coal “ “.....	1,864 28	
“ “ Firewood “ “.....	440 26	
“ “ Phosphates “.....	102 98	
“ Rent of Small Offices.....	718 50	
“ “ Scales.....	800 00	
“ for Penalties.....	24 50	
“ “ Cars Transferred by Str. South Eastern.....	1,870 50	
		<u>\$37,373 97</u>
ORDINARY REVENUE.....		\$230,636 19
FROM DOMINION GOVERNMENT:		
Received on account New Channel works.....	100,000 00	
“ “ maintenance of Buoys and Beacons.....	7,000 00	
		<u>\$107,000 00</u>
“ Rent of Offices in Building.....		2,000 00
“ Canadian Pacific Railway, Rent of Track.....		2,875 04
“ Second Installment on old building sold.....	3,600 00	
“ one year's Interest on Sale of above....	864 00	
		<u>4,464 00</u>
“ Harbour Debentures, Series B, sold....	93,000 00	
“ “ “ Series C, “	132,000 00	
		<u>225,000 00</u>
“ Interest on Bank Accounts, &c.....		2,837 19
“ from Steam Crane Co. Rent of Track...		100 00
Sundry amounts received for Credit as under Harbour Dredging, Plant.....	6,000 00	
New Channel Operations.....	208 57	
Harbour Dredging.....	1,137 00	
“ Repairs.....	15 50	
Lighting Wharves, Coal Oil.....	2 00	
		<u>7,363 07</u>
TOTAL RECEIPTS.....		<u><u>\$582,275 49</u></u>

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The expenditure was as follows :

Harbour Survey.....		\$143 00
Travelling and Incidental Expenses.....		212 70
Legal and Notarial expenses.....		130 50
Dominion Government Interest.....		74,575 34
Harbour Railway.....		500 46
St. Lambert Channels—Government Survey....		93 95
Lighting Wharves—Electric Light.....	1,957 20	
“ “ —Coal Oil.....	622 27	
	<hr/>	2,579 47
Printing, Advertising and Stationery.....		2,970 88
Latrines.....		264 10
R. H. Buchanan & Co., account Steam Pump....		647 60
Mrs. John Young—paid Annuity.....		600 00
Wharfages returned.....		328 97
Hire of Batteau, placed on wreck of S.S. Ottawa..		456 00
Refund of half Tonnage Dues, S.S. Oxenholme de- tained in Quarantine.....	245 28	
Refund of half Tonnage Dues, S.S. Mississippi...	157 55	
	<hr/>	402 83
New Channel Operations.....		176,832 91
Accounts written off Wharfages, &c.....		174 88
Harbour Dredging.....		61,850 35
Harbour Expenses and Management.....		28,574 74
Interest on Harbour Debt.....		114,842 50
Harbour Repairs.....		44,868 96
Buoys and Beacons.....		8,198 78
Harbour Debentures, Series D. D., paid.....	100,000 00	
“ “ “ E. E., “.....	41,000 00	
	<hr/>	141,000 00
		<hr/>
TOTAL EXPENDITURE.....		<u>\$660,249 82</u>

The Revenue statement as compared with the previous year, shows a net decrease of \$17,177.00, viz: In the sea going traffic, \$14,167.64, and in the local \$3,009.36, or say, under 7 per cent.

In looking at this falling off in the receipts, it must be borne in mind that the Harbour Dues on grain were reduced for a period of three months, from 7½ cts. per ton to the merely nominal rate of 1 cent per ton.

A copy of the Chief Engineer's Report, on the works, &c., within the Harbour, is now in course of preparation, and will be forwarded you in a few days. Copies of the following reports have already been transmitted to you, viz: The Harbour Master's, with comparative statements of the trade of the Port, &c.; The Superintendent of Pilots, with reference to the placing, maintaining, &c., of the buoys and beacons in the river St. Lawrence; and the Secretary's, giving particulars as to matters concerning this Pilotage District.

The ocean tonnage for the year, as shown by the Harbour Master's Report, was 649,374 ton, as against 664,263 tons for 1883 or $2\frac{1}{4}$ per cent. less. The Inland tonnage amounted to 726,015 tons.

Operations for deepening the ship channel between Montreal and Quebec to $27\frac{1}{2}$ feet at low water, have been carried on satisfactorily during the season, and a report of the same for the past fiscal year has, as heretofore, been sent to the Department of Public Works.

I have the honor to be,

Sir,

Your obedient servant,

H. D. WHITNEY,
Secretary.

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REPORT
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WORKS FOR THE IMPROVEMENT AND MAINTENANCE
OF THE
HARBOUR OF MONTREAL.
FOR THE YEAR 1884.

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

HARBOUR COMMISSIONERS OF MONTREAL.

Chief Engineer's Office,

MONTREAL, February 26th, 1883.

H. D. WHITNEY, Esq.,

Secretary,

Harbour Commissioners of Montreal.

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, for the year ended 31st December 1884 :—

The principal works of the year are the deepening of the Ship Channel through the Harbour, the filling in alongshore at Hochelaga sections 41 to 44, the deepening of the basins at sections 20, 15 to 12, and 10 to 5. No new wharves have been built nor have any material alterations been made to former wharves.

The following are the chief details of the work done:—

Sections 5 to 10 (Windmill Point Basin).—The widening and deepening of the basin out to the full width of 350 feet at the lower end has been continued with a small force of dredging plant. A large number of boulders and loose masses of rock have also been taken up by the Ship Channel stone-lifters. The basin as it now stands may be said to have an effective depth of 22 feet at low water by 120 to 300 feet in width and 1,300 feet in length from the lower end, or in sections 10, 9 and 8; a depth of 20 feet by 120 feet width and 400 feet length in sections 8 and 7; and above this a depth of 18 feet by 100 feet in width and 800 feet in length in sections 7 and 6. Quantity raised by dredges and stone-lifters 95,386 cubic yards. Expenditure \$39,051.

Sections 12 to 14.—In the Allan Line Basin a few spots having less than 25 feet depth were dredged down to 27½ feet at low water. Quantity dredged 3,206 cubic yards. Expenditure \$1,819.

In the lower part of section 14 (Elgin Basin) a quantity of sewage deposit, amounting to 1,395 cubic yards was removed. Cost \$331.

Section 15. (Island Wharf).—Some dredging was done on shoal spots near the wharf having less than 25 feet water. Quantity dredged 4,027 cubic yards. Expenditure \$1,654.

Section 19. (Bonsecours Basin).—Part of the basin was cleared out to 25 feet depth at low water. Quantity dredged 4,477 cubic yards. Expenditure \$992.

Section 20. (Victoria Pier).—The berths both inside and outside the pier were dredged out to 27½ feet depth at low water. A few spots in the Military Basin were also cut

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down to the same depth. Quantity dredged 13,602 cubic yards, costing \$4,465.

Sections 38 and 39 Hochelaga.—Some shoal places close to the wharf on which there was less than 25 feet were dredged down to that depth. Quantity dredged 3,555 cubic yards. Expenditure \$1,157.

Sections 41 to 44 Hochelaga.—Nearly all the hard material dredged out of the different parts of the Harbour during the summer has been deposited alongshore, chiefly by clamshell derricks, in such a way as to form part of the back filling for future extension of the wharfage below the Hudon Cotton Mill. Quantity deposited by derricks 70,650 cubic yards; by dumping scows and by hand about 5,000 cubic yards. Part of the material deposited in former years was also levelled down by hand.

Harbour Railway Tracks—Sections 36 and 37.—In section 36 the Harbour Commissioners tracks, leased to the Canadian Pacific Railway Company, was extended downwards 330 feet. Cost \$266.

In section 37 the track leased to the Montreal Steam Crane Company was extended 210 feet at a cost of \$218.

Ship Channel through the Harbour.—*Opposite sections 12 to 20.*—The deepening to 27 feet at low water was continued as before. Expenditure \$11,245.

HARBOUR REPAIRS.

Section 12.—The high level wharf at the extreme upper end of the basin was repaired and replanked. Cost \$358.

Section 16.—476 feet in length of the upper end of the wharf used by the Dominion Steamship Line was raised to standard level and covered anew. Cost \$3,284.

Longue Pointe.—The lowermost wharf, damaged by the spring shove of ice, was altered and repaired. Cost \$474.

Roadways.—In order to increase the area of macadamizing and to materially improve that already on the roadways of the wharves 1,250 toises of banc rouge macadamizing stone, or about 50 per cent. more than usual, were used during the summer.

The other harbour repairs for the year have been light and have mainly consisted of ordinary maintenance and repairs of the wharves and roadways.

The total expenditure under the head of Harbour Repairs has amounted to \$44,869, and compares as follows with that of previous years:—

1875.....	\$16,449
1876.....	35,711
1877.....	26,077
1878.....	18,974
1879.....	18,819
1880.....	17,330
1881.....	16,159
1882.....	27,962
1883.....	35,768
1884.....	44,869

HARBOUR DREDGING.

The Harbour Dredging Fleet was reduced by the sale of the oldest or No. 2 spoon dredge in the fall of 1883 and the working strength during the past summer was therefore: four spoon (or dipper) dredges, two derricks, three screw tugs, with scows and floating-shop as detailed in the annexed table. Some assistance in the harbour work has been rendered by the two stone-lifters of the Ship Channel Fleet, and on the other hand the harbour dredges worked a considerable portion of their time in improving that part of the ship channel which runs through the Harbour.

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The dredges, tugs and derricks were, as usual, wintered in the Richelieu River at the Harbour Commissioners Works Sorel. A few of the scows were also wintered at Sorel and the remainder at the Boucherville Islands.

Several vessels of the fleet received unusually heavy repairs and overhaul both in machinery and hulls. The following are the principal items :

Dredge No. 4.—New deck, covering board and fender ribbons; new coaming to deck-house and important repairs to joiner work generally. Crane rebuilt and all woodwork renewed except the main braces and part of turntable. New cylinder and slide valve to main engine new main pinion, new pitch chain wheels, and a number of other important repairs and renewals of parts of engine and machinery. New smoke stack and light repairs to boiler. A pair of new swinging engines, 7 x 8 cylinders, built ready to put in during the present winter.

Dredge No. 5—Hauled out and wintered on the stocks. Fitted with new slides for stern spud, forward slides and false bilge keels taken off, caulked under and replaced; four side guards renewed bow stiffened with additional screw bolts, half the deck and part of covering boards renewed; sundry small repairs; caulked all over. New drum for main chain; main spur wheel bored out and rebushed; boom taken down and fitted with new sheaves at outer end; bed-plate for turntable rebolted to hull; engine fitted with new link and pins to valve gear; piston refitted; several other repairs and renewals of parts of engines and machinery. New backing gear partly made, to fit in this winter. Boiler fitted with back tube sheet and one sheet in shell, the tubes, 70 in number, cut, lengthened and replaced.

During the summer the heavy working strains from dredging rock in deep water caused the seams about the

forward, or crane end of the hull to work and leak badly, making it necessary to dock the dredge twice for caulking and light repairs. At the second time, two pairs of $2\frac{1}{4}$ inches diagonal bolts and other bolts and strengthening pieces were added to the forward slides and hull in order to stiffen them and prevent further injurious working.

Dredge No. 6.—Hauled out and wintered ashore. New slides for stern spud: forward slides and false bilge keels taken off, caulked under and replaced; new overhead frame between slides, and new side guards, or chocks, provided for slides; sides of hull strengthened with new ceiling and knees; bow strengthened with additional screw bolts; deck renewed; hull and deck caulked throughout. New pitch chains for both spud and winch gear: new spur wheel and pinion of stronger pattern for lifting forward spuds; several repairs and renewals to parts of main and swinging engines; new backing gear built ready to be put in during present winter. New smoke stack and light repairs to boiler.

Dredge No. 7.—Crane and turn-table nearly all rebuilt with new timber; new stern spud; light repairs to cabin and other parts; hull above water line and deck, caulked. Changed main chain drum (for a spare one from No. 5 dredge) and put on new main spur wheel; put new sheaves and sprocket wheels throughout for main chain; four new sheaves for $\frac{7}{8}$ inch swinging chain; two new chain barrels for inch chain for lifting spuds; new pitch chain wheel on winch shaft; sundry repairs to engine and other parts of machinery.

Derrick No. 2.—New A frame; one new spud; light repairs to hull and joiner work; deck and top sides caulked; new crown wheel to swinging gear; some new sheaves and sundry repairs to machinery.

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Derrick No. 3.—Two new spuds; light repairs to deck and joiner work; deck and top sides caulked. Light repairs to machinery. A clam shell rebuilt and fitted with new boiler plate body for use with either derrick.

Pile driver (Old derrick No. 1).—Hauled out and wintered on stocks. Hull rebuilt and furnished with new sides and ends, and new deck and beams; new slide for spud.

Tug St. Peter.—Wheel-house taken down and fitted up anew (to make good damage by being run into): new coal bunkers and sundry light repairs to hull and cabin; deck and top sides caulked. Sundry light repairs to engine and boiler. Docked during summer for caulking and light repairs.

Tug St. Louis.—Took away part of wheel-house and deck, to allow of repairing boiler, and renewed same; new tow posts, new skylights; guards repaired; deck and top sides caulked. Piston fitted with new springs and bolts; boiler furnace repaired with four patches; ten new boiler stays added; tubes taken out and pieced and replaced; main flues strengthened with hoops (to conform to new Steamboat Inspection Law). Docked during summer for caulking and light repairs.

Tug St. Paul.—New coal-bunkers and light, general repairs to hull and joiner work; deck and top sides caulked. Piston fitted up and light general repairs to engine; feed water heater renewed. Docked during summer for caulking and light repairs.

Floating Shop.—Wintered on stocks for heavy repairs. Timbers and side planking largely renewed; new deck and deck knees; new rail all round; new bulkheads and nearly all new lockers, shelving, racks, &c., for stores in hold; new foundations for steamhammer and for smiths' anvils; joiner work on deck overhauled and in part renewed.

Scows.—One flat scow overhauled and furnished with new side planking and timbers; three others had decks renewed, and repaired generally; two dumping scows had wells renewed and general repairs; several scows hauled out and caulked and repaired in different ways.

On the 24th of April, or immediately after the clearing away of the ice from the St. Lawrence, the Harbour dredging fleet was brought up from Sorel, and all the dredges were got to work in the Harbour between the 29th April and 1st May. All except No. 5 continued at work, either at Harbour dredging proper, or in the Ship Channel through the Harbour, until Nov. 29th, when the frost became so severe as to make it necessary to send them to Sorel to be laid up. Dredge No. 5 with Tug St. Peter and two scows, were chartered six days in May by the Harbour Commissioners of Three Rivers for work in that Harbour. The number of days which the Spoon Dredges were on duty, that is all except Sundays, and the charter time of No. 5 Dredge, from commencing in Spring until leaving off in the Fall, was 177 days for No. 5 Dredge, 184 each for Nos. 4 and 6, and 185 for No. 7, making an aggregate of 730 days, without deduction for stoppages. The nominal working time is 10 hours per day, which gives a total of 7,300 hours' service; but the actual dredging time, after deducting time lost for repairs, changing position, detention by vessels, short days in autumn, and all other causes, is reduced to 6,343 hours, or an average of 86.51 per cent. of the gross time of service.

The total outlay for working the fleet, consisting of 4 spoon dredges, two unloading derricks, three tugs and the scows was \$49,468, and this, as usual, represents the entire cost of working the plant, machinery, repairs, outfit, fuel, wages, salaries, insurance, and all other outlays, except interest on capital and depreciation of plant. The very heavy repairs above detailed have made the year's expenditure high; but on the other hand, the quantity dredged

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is very fair, and if with this it be taken into account that the number of dredges has been reduced from five to four, without reduction of tugs or other plant, and that the dredging has been largely in hard ground and deep water, the comparison with other years is not unfavorable. The following are the comparative costs and quantities of dredging for 1884, and for previous years:—

YEARS.	COST.	CUBIC YARDS DREDGED.	COST PER CUBIC YARD, CENTS.	REMARKS.
1875...	\$68,979	151,719	45	
1876...	55,462	156,082	35 $\frac{50}{100}$	
1877...	45,103	173,449	26	
1878...	48,748	211,731	23	
1879...	41,006	189,609	21 $\frac{53}{100}$	
1880...	46,914	186,430	25 $\frac{19}{100}$	
1881...	54,128	170,764	31 $\frac{59}{100}$	
1882.	53,598	187,339	28 $\frac{51}{100}$	Spoon dredges and stone lifters.
	13,254	9,429	\$1.40 $\frac{50}{100}$	Elevator dredges.
	66,852	196,768	33 $\frac{36}{100}$	Average.
1883.	17,956	36,358	49 $\frac{38}{100}$	Spoon dredges and stone lifters.
	19,385	6,990	\$2.77 $\frac{30}{100}$	Elevator dredges—lifting rocks and boulders and clearing up.
	37,341	43,348	86 $\frac{14}{100}$	Average.
1884...	49,468	125,648	39 $\frac{37}{100}$	Spoon dredges and stone-lifters.

The following are the cost and character of the dredging done in the different parts of the Harbour during the year.

Sections 5 to 10 (Windmill Point Basin):—Enlarging and deepening the Basin and cleaning up loose boulders and rock-material, chiefly shale, hard pan and gravel, dredged with spoon dredges, and boulders, &c., grappled with stone-lifting barges. Depth of water at time of dredging 25 to 30 feet. Quantity 95,386 cubic yards, measured loose on scow, costing \$39,051, or 41 cents per yard.

Sections 12 to 14.—Clearing off small spots; much interruption by vessels; hard-pan, gravel and sand; 25 to 30 feet depth of water; 3,206 cubic yards, costing \$1,819 or 56 $\frac{3}{4}$ c. per yard.

Section 14 (Elgin Basin).—Cleaning out; chiefly sewage deposit; about 28 feet water; 1,395 cubic yards, costing \$331, or 23 $\frac{3}{4}$ c. per yard.

Section 15 (Island Wharf).—Clearing off small shoals; much interruption by vessels; 25 to 30 feet of water: 4,027 cubic yards, costing \$1,654, or 41c. per yard.

Section 19 (Bonsecours Basin).—Deepening hard-pan, boulders and sand; 25 to 30 feet depth of water; 4,477 cubic yards; costing \$992, or 22 $\frac{1}{8}$ c. per cubic yard.

Section 20.—Clearing out gravel deposit about Victoria Pier, mostly in small lumps, and alongside wharf; 25 to 30 feet depth of water; 13,602 cubic yards; costing \$4,465 or 32 $\frac{3}{4}$ c. per yard.

Sections 38 and 39 (Hochelaga).—Cutting away a small shoal near the wharf; boulders, gravel and sand; 29 feet depth of water; 3,555 cubic yards; costing \$1,157 or 32 $\frac{1}{2}$ c. per yard.

Yours respectfully,

JOHN KENNEDY,
Chief Engineer.

HARBOUR DREDGING—Statement Showing the number of days worked by each Dredge, and the quantity dredged at each place for the Harbour of Montreal in 1884.

PLACES WHERE DREDGES WORKED.	VESSELS.	DAYS.	TOTAL DAYS.	QUANTITIES DREDGED.			REMARKS.
				Spoon Dredges.	Stone Lifters.	Totals. Cubic yds.	
Sections 5 to 10, Windmill Point.....	Dredge No. 4. " " No. 5. " " No. 6. " " No. 7.	54 105 180 129	468	13,050 17,359 33,997 30,690		95,096	Shale rock, hard pan, gravel, sand and boulders.
	S. Lifter No. 1. " " No. 2.	24 13	37		109 181	290	Stones.
" 12 to 14, Allans's Basin.....	Dredge No. 4. " " No. 5. " " No. 6.	10 8 4	22	1,552 1,069 585		3,206	Hard pan, gravel, sand, boulders.
" 14, Elgin Basin.....	" No. 7.	4	4	1,395		1,395	Sewage.
" 15, Island Wharf.....	" No. 5.	20	20	4,027		4,027	Hard pan, gravel and stones.
" 19, Bonsecours Basin.....	" No. 7.	12	12	4,477		4,477	Hard pan, boulders and sand.
" 20, Military Basin.....	" No. 5. " " No. 7.	44 10	54	10,689 2,903		13,602	Boulders, gravel and quick sand.
" 38 to 39, Hochelaga.....	" No. 7.	14	14	3,555		3,555	Boulders, gravel and sand.
Totals.....			631	125,358	290	125,648	

HARBOUR DREDGING—ABSTRACT OF WORK DONE BY EACH DREDGE FOR THE HARBOUR OF MONTREAL IN 1884.

VESSELS.	Time of Service.		PLACES AT WHICH DREDGES WORKED.	QUANTITIES DREDGED, CUBIC YARDS.			REMARKS.
	Days.			Spoon Dredges.	Stone Lifters.	Totals. <i>Cubic Yds.</i>	
Dredge No. 4.....	54 10		Sections 5 to 10, Windmill Point..... 12 to 14, Allan's Basin.....	13,050 1,582		14,602	Shale rock, hard pan, sand and boulders. Gravel, sand and boulders.
Do. No. 5.....	105 8 20 44		5 to 10, Windmill Point..... 14, Elgin Basin..... 15, Island Wharf..... 20, Military Basin.....	17,359 1,069 4,027 10,699		33,154	Shale rock, hard pan and stones. Hard pan and stones. Hard pan, gravel and stones. Quick sand.
Do. No. 6.....	180 4		5 to 10, Windmill Point..... 12, Allan's Basin.....	33,997 585		34,582	Shale rock, hard pan, gravel, sand and boulders Hard pan, boulders and mud.
Do. No. 7.....	129 4 12 10 14		5 to 10, Windmill Point..... 14, Elgin Basin..... 19, Bonsecours Basin..... 20, Military Basin..... 38 and 39 Hochelaga.....	30,690 1,395 4,477 2,903 3,555		43,020	Shale rock, hard pan, sand and boulders. Sewage. Hard pan, boulders and sand. Boulders, gravel and sand. Do. do.
Stone-Lifter, No. 1.....	24		5 to 10, Windmill Point.....		109	109	Stones.
Do. do. No. 2.....	13		5 to 10, Windmill Point.....		181	181	Stones.
Totals.....	631			125,358	290	125,648	

The dredging done in the Ship Channel through the Harbour is not included in the above table.

REPORT
OF THE
HARBOUR MASTER OF THE PORT OF MONTREAL.
FOR THE YEAR 1884.

CAPTAIN THOMAS HOWARD, *Harbour Master.*

HARBOUR COMMISSIONERS OF MONTREAL,
HARBOUR MASTER'S OFFICE,
MONTREAL, January 7th, 1885.

H. D. WHITNEY, Esq.,
Secretary,
Harbour Commissioners of Montreal.

SIR,—

I beg to submit for the information of the Board of Harbour Commissioners, the following, as my Annual Report, for the year 1884, with comparative statements, showing the number, tonnage, classification, nationality, and greatest number of vessels in port at one time. Also, statements showing the opening and closing of navigation, first arrival from sea and last departure for sea, with statements showing the number, and tonnage of inland vessels, and the greatest number in port at one time, during the past ten (10) years.

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Six hundred and twenty-six (626) sea-going vessels arrived in port during the past season, of the aggregate tonnage of 649,374 tons, showing a decrease of forty-six (46) vessels, and 14,919 tons in tonnage as compared with the year 1883.

Of these vessels, 438 were built of iron of an aggregate tonnage of 581,784 tons, and 188 built of wood, of an aggregate tonnage of 67,590 tons. Of inland vessels there arrived in port 4,808 of an aggregate tonnage of 726,015 tons and a total of 5,434 vessels of all classes and 1,375,389 tons in tonnage.

Of inland vessels there is a decrease of 669 vessels, and in tonnage 387,06 tons.

There were 24,386,373 feet of lumber shipped for South America, during the season, in 47 vessels, showing an increase of 11,747,721 feet over the previous year, and 24 vessels. The South American trade is one of great importance, and has nearly doubled this year. I trust that the Commissioners will see the advisability of extending the wharf at Hochelaga, so as to furnish accommodation to those in the trade, and also to meet the requirements of the Canadian Pacific Railway Co., whom I have no doubt will require large space in that locality.

There were shipped during the season to the United Kingdom, by 134 steamers, and 14 sailing vessels, 52,587,205 feet of lumber, making a grand total of 76,873,578 feet shipped from this port during the season of 1884, showing an increase of 13,722,548 feet over the previous year.

The Coal Trade.—During the season, we had from Great Britain 52,342 tons, showing an increase of 933 tons, and 348 tons of coke. And from the United States 222,699 tons, showing an increase of 12,508 tons; and 400 tons of coke. From Germany, 36 tons of coal, making a total of 275,825 tons. We had 217,410 tons from the Maritime Provinces, showing a decrease of 51,002 tons, making a

total from all sources of 493,235 tons, and a decrease on the year of 36,777 tons. This decrease is principally caused by the Grand Trunk and other Companies, importing a large quantity of coal by rail.

The shipment of phosphate from this port is increasing steadily every year, as shown by the following figures. In 1880, 7,500 tons were shipped; 1881, 10,307 tons; 1882, 15,556 tons; 1883, 17,160 tons; and in 1884, 20,461 tons.

The Canadian Pacific Railway Co. have now under construction (two) large elevators, for the purpose of receiving the grain from their road and shipping the same into ocean vessels, which will no doubt greatly increase the demands for shipping accommodation in this locality. I hope the Commissioners will make the necessary improvements so as to be ready for the trade when it comes.

JANUARY, Tuesday 1st, commenced with snow-storm, water very high, good sleighing; on the 2nd great snow-storm, at 11 A.M., ice shoved; on 3rd ice still shoving; on the 5th 12 below zero; on the 6th 15 below; on the 8th 10 below; on the 9th much milder temperature, 20 above; on the 15th cold, 15 below zero; on the 19th 20 below; on the 28th 15 below; on the 31st very mild, 35 above; the month throughout was cold, sleighing good, crossing on the ice all through the month.

FEBRUARY 1st set in mild, temperature 27; on the 8th very cold, 5 below zero; on the 13th mild with rain, temperature 33; on the 15th fine and cold, temperature 20 above; on the 28th rain, nasty weather; on the 21st fine and cold; on the 25th 6 above; on the 28th snow-storm; on the 29th zero, great wind and snow-storm, the most violent of the winter.

MARCH 1st, fine weather, temperature 10 above; on the 3rd cold, 12 below; on the 8th dreadful day, blowing a gale from the East, with snow-storm; on the 12th very mild, temperature 37; on the 17th snow and rain; on the

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24th snow disappearing, temperature 45; on the 29th water rising; on the 31st cold west wind, temperature 25.

APRIL 1st, cold, clear weather; on the 4th cold west wind, temperature 37; on the 8th fine and mild, temperature 42; on the 11th, Good Friday, rain in the morning, ice shoved at 3 P. M., lasting for two hours; at 6 P.M., channel quite clear opposite the city; on the 19th water falling fast; on the 22nd clearing the wharves, sheds putting up. Ferry steamer "South Eastern" arrived in port, first of the season; on the 28th navigation open to Quebec; on the 30th fine weather, temperature 47.

MAY 1st, fine and warm, SS. "Peruvian" arrived in Quebec; on the 2nd SS. "Lake Champlain" arrived at 8.30 A. M., first arrival from sea. The temperature during the month averaged about 60; on the 28th cold North-East wind, temperature 45; on the 31st continued cold, temperature 50.

JUNE 1st, fine and warm, temperature 65; on the 3rd very warm, temperature 75; on the 10th cold, easterly wind, temperature 59; on the 20th temperature 80; on the 25th temperature 60; on the 30th temperature 80.

JULY 1st, temperature 84; on the 5th rain, temperature 75; on the 8th East wind, temperature 65; on the 12th temperature 75; on the 23rd temperature 75; on the 31st dark day with rain and blowing a gale, temperature 70.

AUGUST 1st commenced fine, temperature 70; on the 8th temperature 65; on the 17th temperature 90; on the 18th temperature 90; on the 21st temperature 90; these were the hottest days of the season; on the 31st blowing a gale, temperature 65.

SEPTEMBER 1st, fine, clear days, temperature 65; on the 4th at 9 A.M., temperature 80; on the 7th temperature 88; this was the hottest day during the month; on the 12th great change in the weather, temperature 65; on the 17th

temperature 65 ; on the 19th frost during the night, 8 A.M. temperature 40 ; on the 25th temperature 68 ; on the 28th at 9 A. M. thunder storm ; on the 30th fine weather, temperature 68.

OCTOBER 1st, temperature 70 ; on the 5th temperature 65 ; on the 10th temperature 45 ; on the 17th temperature 55 ; on the 21st cold, East wind, temperature 45 ; on the 31st temperature 40.

NOVEMBER 1st, rain all day, temperature 45 ; on the 6th cold North wind, temperature 30, snow during the night ; on the 13th cold, frosty morning ; on the 18th, temperature 22 ; on the 23rd the SS. "Coban " left, being the last ship for sea of the season ; on the 29th snow during the night, temperature 32 ; on the 30th fine weather and good sleighing.

DECEMBER 1st, temperature 21 above ; on the 10th 20 above ; on the 15th snow and rain, temperature 35 ; on the 17th 10 below zero ; on the 18th 15 below ; Ferry Boats went to winter quarters ; on the 19th 25 below, and said to be 30 on the mountain ; on the 24th water over the wharves, temperature zero, ice making fast ; on the 25th temperature 5 above ; on the 28th great change in the weather, temperature 32, rain all day ; on the 31st very mild, temperature 40, water falling, sleighing bad, river open opposite the city.

Yours respectfully,

THOMAS HOWARD,
Harbour Master.

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PORT OF MONTREAL.

Statement showing the Nationality and Tonnage of Sea-going Vessels that arrived in Port during the Season of 1884, that were navigated by 17,383 Seamen.

Nationality.	Number of Vessels.	Tonnage.
British	594	630,224
Norwegian	14	8,254
German	4	3,717
American	6	3,262
Swedish	3	1,488
Austrian	2	1,051
Belgian	1	1,059
French	2	319
Total	626	649,374

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 last ten years.

YEARS.	Opening of Navigation.	Closing of Navigation.	First Arrival from Sea.	Last Departure for Sea.
1875.....	May 3.	Nov. 29.	May 9.	Nov. 22.
1876.....	April 27.	Dec. 10.	" 8.	" 23.
1877.....	" 17.	Jan. 2, '78.	April 29.	" 24.
1878.....	March 30	Dec. 23.	" 20.	" 24.
1879.....	April 24.	" 19.	May 1.	" 24.
1880.....	" 17.	" 3.	" 2.	" 22.
1881.....	" 21.	Jan. 2, '82.	April 29.	" 23.
1882.....	" 11.	Dec. 9	May 6.	" 21.
1883.....	" 27.	" 16.	" 5.	" 20.
1884.....	" 22.	" 18.	" 2.	" 20.

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PORT OF MONTREAL.

Comparative Statement showing the Number and Tonnage of Inland Vessels that arrived in Port the past ten years, with the greatest number in Port at one time.

YEARS.	Number of Vessels.	Tonnage.	Greatest Number in Port At one time.
1875.....	6,178	811,410	256..... Aug. 4.
1876.....	6,083	786,083	262..... Nov. 9.
1877.....	6,333	847,978	258..... Oct. 3.
1878.....	5,502	764,243	261..... " 15.
1879.....	5,698	817,243	227..... Nov. 6.
1880.....	6,489	1,044,380	253..... July 7.
1881.....	6,030	949,380	191..... Nov. 4.
1882.....	5,947	848,780	190..... Sept. 29.
1883.....	5,477	764,721	174..... " 5.
1884.....	4,808	726,015	161..... July 9.

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.
1875.....	120	69,544	3	1,874	27	13,180	2	331	35	5,397	92	8,526	279	98,852
1876.....	87	47,199	1	739	30	15,451	4	993	25	4,220	67	7,322	214	75,924
1877.....	72	39,277	5	4,306	25	13,566	3	758	18	2,744	37	3,924	160	64,575
1878.....	42	21,812	2	1,132	32	15,749	3	954	21	4,196	65	6,683	165	50,526
1879.....	62	40,686	2	1,733	59	32,271	1	457	16	3,660	80	8,573	220	88,380
1880.....	88	62,688	3	2,492	59	36,294	1	413	17	5,001	68	6,562	236	113,450
1881.....	104	80,040	1	734	44	10,666	2	553	13	2,502	48	4,883	212	99,378
1882.....	168	136,036	.....	.....	25	15,574	.....	.....	13	2,364	54	5,993	260	159,967
1883.....	191	164,982	.....	.....	11	8,066	1	307	6	1,015	54	5,620	263	179,990
1884.....	161	124,377	.....	.....	8	5,031	.....	.....	1	456	40	3,825	210	133,689

PORT OF MONTREAL.

COMPARATIVE STATEMENTS, showing the Number, Tonnage, and Classification of Sea-going Vessels that arrived in Port from the Maritime Provinces the Past Ten Years.

PORT OF MONTREAL.

COMPARATIVE STATEMENTS, 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 number of vessels.	Total number of tonnage.	Greatest Number in Port at one time.
1875..	256	255,435	40	39,895	138	63,167	17	3,833	53	9,801	138	13,981	642	386,112	60.....Aug. 18th.
1876 .	240	262,829	40	37,303	146	66,002	18	4,700	35	5,848	123	14,498	602	391,180	61.....July 24th.
1877 ..	247	261,764	41	41,904	108	56,909	10	2,560	25	4,987	78	8,735	513	376,859	59.....Oct. 19th.
1878 ..	207	269,878	44	47,577	113	58,711	9	2,610	34	6,537	109	11,953	516	397,266	45.....June 3rd.
1879 ..	289	378,353	33	38,412	121	65,223	5	1,404	37	8,560	127	15,017	612	506,969	49.....Aug. 13th.
1880 ..	354	475,741	42	50,141	143	76,816	11	3,252	41	9,715	119	12,606	710	628,271	67..... " 4th.
1881 ..	321	446,457	5	4,640	104	60,617	9	2,377	30	6,152	100	11,686	569	531,929	59..... " 18th.
1882 ..	379	475,679	4	4,330	93	51,195	10	2,702	37	7,182	125	13,604	648	554,692	53..... " 21st.
1883 ..	464	605,805	3	3,356	70	38,547	7	2,417	15	3,012	101	11,126	660	664,263	38.....June 27th.
1884 ..	444	585,397	2	2,218	83	49,048	3	1,036	13	2,996	81	8,679	626	649,374	44.....Aug. 13th.

PORT OF MONTREAL.

Number and Tonnage of Sea-going Vessels consigned to the following Merchants, 1884:—

No.	NAMES.	STEAM.	TONNAGE.	SAIL.	TONNAGE.	TOTAL No.	TOTAL TONNAGE.
1.	H. & A. Allan.....	72	148,362	.....	.....	72	148,362
2.	R. Reford & Co.....	61	89,800	5	2,774	66	92,574
3.	D. Torrence & Co.....	39	88,021	.....	.....	39	88,021
4.	Canada Shipping Co.....	25	49,185	1	1,079	26	50,264
5.	Henry Dobell & Co.....	57	41,611	2	784	59	42,400
6.	J. G. Sidey.....	35	33,582	4	2,341	39	35,923
7.	Kingman, Brown & Co..	35	28,519	2	1,085	37	29,604
8.	Anderson McKenzie....	4	3,450	39	22,321	43	25,771
9.	David Shaw.....	26	23,794	1	356	27	24,150
10.	H. Dobell (from Canal)..	27	18,878	.....	.....	27	18,878
11.	Carbray, Routh & Co....	12	11,774	.....	.....	12	11,774
12.	Chas. M. Lea.....	7	10,565	.....	.....	7	10,565
13.	Wm. Muir & Son.....	10	8,191	.....	.....	10	8,191
14.	F. W. Henshaw.....	9	7,130	1	762	10	7,892
15.	Munderloh & Co.....	4	4,060	5	2,568	9	6,628
16.	C. A. Boucher.....	.....	.....	57	6,422	57	6,422
17.	J. R. McLea.....	4	3,171	4	2,727	8	5,898
18.	Wulff & Co.....	.....	.....	11	5,543	11	5,543
19.	W. D. Bentley.....	5	5,262	.....	.....	5	5,262
20.	S. W. Heward.....	2	1,595	6	2,373	8	3,968
21.	Canada Sugar Ref'g Co..	.....	.....	5	3,392	5	3,392
22.	John Hope & Co.....	1	1,362	2	1,835	3	3,197
23.	Lomer, Alexander & Co.	2	1,734	2	994	4	2,728
24.	Gillespie & Moffatt.....	1	999	3	1,676	4	2,675
25.	Dominion Coal Co.....	2	1,868	2	1,868
	And eight others.....	4	2,484	32	4,940	36	7,424
		444	585,397	182	63,977	626	649,374

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REPORT
OF THE
SUPERINTENDENT OF PILOTS.

JOSEPH LEVEILLÉ, *Superintendent of Pilots.*

HARBOUR COMMISSIONERS OF MONTREAL,
Superintendent of Pilots' Office,
MONTREAL, 18th December, 1884.

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

SIR,

I have the honor to submit herewith, for the information of the Harbour Commissioners, the Annual Report having reference to the maintenance of the Buoys and Beacons within this Pilotage District for the year 1884.

Navigation opened this season on the 24th day of April, and closed on the 29th November.

During the season, the tug "John Pratt" was employed eighty-six days, comprising sixteen trips of more or less duration, according to the work to be done; the first trip, for placing the buoys in position, and the last for taking them up, being the most important; the intermediate trips were to replace any buoys that might have been displaced by passing vessels or otherwise.

There were about 200 buoys placed in the river between Montreal and Pointe-aux-Trembles (*en bas*) this season, Contrecœur, Lake St. Peter, and Cap-à-la-Roche requiring the greater number. Of these, eighteen are iron and the remainder wooden.

More buoys have been lost this season than usual, two iron buoys, which were left in position last winter, were carried away by the ice in the spring, and three iron buoys, were dragged away this season by passing vessels, making a total of five iron buoys lost, besides twenty-two wooden ones, also carried away.

The beacon at Pointe-des-Grondines was replaced in the spring, and during the summer, a large number of other beacons were painted.

There was found during the season sufficient chain to make up for what has been lost.

There remains in the yard at Sorel a sufficient supply of buoys and tackle to serve for two years. Over and above the buoys lifted on my last trip, there is on hand (225) two hundred and twenty-five buoys fit for use.

In conclusion I add the usual table showing the plans of the buoys, and the number left in position or taken up, and the number and places of the beacons.

I have the honor to be,

Sir,

Your humble servant.

JOSEPH LEVEILLÉ,
Superintendent of Pilots.

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Statement showing the number of buoys and beacons, and their positions, and also the number of buoys taken up or left down :—

PLACE.	BUOYS.					BEACONS.
	Left down.		Taken up.			
	Iron.	Wood.	Iron.	Wood.	Barrels.	
Harbour of Montreal.....				7		
Hochelaga to Ile Bouchard...				29		
Longue Pointe.....						2
Varennés, Grand Ile.....						2
Ile Deslauriers.....						2
Lavaltrie Traverse.....	3			13		
Contrecoeur to Sorel.....		3		16	16	6
Sorel, Lake St. Peter & Nicolet	5	11	1	48		2
Three Rivers to Becancour...	1			13		
Cap Madeline.....						2
Champlain.....				4		2
Batiscan Traverse, Levrant } and St. Pierre.			1	9		3
Cap La Roche & Pt. Grondines		3	4	4		2
Pointe Grondines (en haut)..						2
Cap Charles, Batture & Cadieux			1	3		2
Grondines.....				1		
Richelieu and Pointe Peaton.				2		
St. Croix and Pt. aux-Trembles (en bas)			2			
Total.....	9	17	9	149	16	27

REPORT
OF THE
PILOTAGE DISTRICT OF MONTREAL
FOR THE YEAR 1884.

HARBOUR COMMISSIONERS OF MONTREAL,
Secretary's Office,
MONTREAL, January 19th, 1885.

WM. SMITH, ESQ.,
Deputy Minister of Marine,
OTTAWA.

SIR,

I have the honor to submit herewith, for the information of the Honorable the Minister of Marine, the Annual Report of the Pilotage District of Montreal, for the year ended 31st December, 1884.

There was no increase in the number of apprentices during the year.

The following apprentice Pilots having passed successful examinations in March, 1883, received their Branches as Pilots on February 20th, 1884, in accordance with the Harbour By-Laws, regarding Pilotage, viz., Messrs. Nestor Arcand, John Naud and Joseph Dussault:—

There were no deaths among the Pilots on the active list, but the following superannuated Pilots died during the year, viz:—

F. A. Mayrand, aged 66, on January 6th, 1884. Edouard Naud, aged 43 years, who had become insane and been placed upon the pension list, died on April 15th, 1884, and P. M. Mathieu, aged 66 years, on December 10th, 1884.

The following is a list giving the name and age of each Pilot acting in this district under the authority of this Trust, with the earnings of each for the season of 1884:—

No.	
1	L
2	B
3	B
4	L
5	R
6	N
7	B
8	D
9	D
10	B
11	G
12	B
13	N
14	H
15	C
16	B
17	B
18	B
19	P
20	B
21	B
22	C
23	G
24	F
25	St
26	B
27	G
28	Pe
29	To
30	A
31	D
32	La
33	Pe
34	Ga
35	Bo
36	To
37	Ga
38	Ar
39	Na
40	Ga
41	Ma
42	Du
43	Ar
44	To
45	Bo
46	Ar
47	Na
48	Du

No.	NAME.	AGE.	EARNINGS.	REMARKS.
1	Léville, Joseph.....	67	Supt. of Pilots.
2	Bouillé, Zepherin.....	56	\$1,254.76	
3	Bélisle, Cyrille.....	57	486.77	
4	Lisé, Adolphe.....	55	262.73	
5	Raymond, George.....	55	713.95	
6	Naud, Augustin.....	58	1,721.22	
7	Bélisle, Hubert A.....	54	630.48	
8	Dufresne, Athanase.....	51	919.77	
9	Dorval, J. B.....	53	225.66	
10	Bouillé, Louis N.....	58	1,000.00		Pilot Str. Montreal
11	Gagnon, Pierre.....	57	1,069.00	
12	Bélisle, George.....	45	542.23	
13	Naud, Onésime.....	44	1,191.49	
14	Hamelin, J. Octave.....	51	872.86	
15	Chandonnet, Jos.....	44	1,704.33	
16	Bouillé, Louis A.....	45	1,186.00	
17	Boudet, Prudent.....	43	1,306.31	
18	Bélisle, Elzéar.....	50	508.91	
19	Pleau, Joseph.....	47	943.95	
20	Brunet, Célestin.....	42	1,361.97	
21	Bélisle, Louis.....	39	1,682.87	
22	Caien, Dumas.....	44	245.25	
23	Groleau, Ulric.....	37	531.15	
24	Frenette, Alfred.....	45	686.79	
25	St. Armand, Alfred.....	41	866.35	
26	Bélangier, Phillipe.....	46	1,106.21	
27	Gagnon, Victor.....	46	598.50	
28	Perrault, Narcisse.....	47	1,134.06	
29	Toupin, Treflé.....	37	770.36	
30	Auger, Cléophas.....	38	1,204.95	
31	Desjordy, François.....	40	447.05	
32	LaBranche, Ferdinand.....	39	1,188.09	
33	Perrault, David.....	43	1,418.56	
34	Gauthier, Alexis.....	38	1,175.81	
35	Bouillé, Louis Z.....	36	1,167.08	
36	Toupin, Joseph.....	35	916.75	
37	Gauthier, Laurent.....	35	1,237.20	
38	Arcand, Jean.....	32	780.18	
39	Nault, Delovoie.....	33	927.21	
40	Gauthier, Wilbrod.....	33	1,042.47	
41	Mayrand, Louis.....	37	419.11	
42	Dufresne, George.....	36	219.66	
43	Arcand, Norbert.....	32	837.86	
44	Toupin, Uldoric.....	30	618.24	
45	Bouillé, Tancrede.....	31	609.12	
46	Arcand, Nestor.....	29	549.96	
47	Naud, John.....	28	681.56	
48	Dussault, Joseph.....	29	584.79	
	Total.....		\$41,549.58	

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

BRITISH :			
Steamers.....	\$32,904.99		
Sailing Vessels.....	5,903.12		
			38,808.11
FOREIGN :			
Steamers.....	\$1,003.60		
Sailing Vessels.....	1,737.87		
			\$2,741.47
			\$41,549.58

The following list shows the name and age of each apprentice Pilot serving his time under the authorities of this trust:—

No.	NAME.	AGE.	RESIDENCE.
1	Alphonse Cossette.....	36	Champlain.
2	Gédéon Groleau.....	32	Grondine.
3	Néré Belisle.....	32	Deschambault.
4	Hubert Perrault.....	35	Montreal.
5	Audilon Portelance.....	31	Grondine.
6	Leboire Perrault.....	35	Deschambault.
7	Joseph Hurteau.....	24	Contrecœur.
8	Wilfred Raymond.....	30	Deschambault.
9	Adolphe Richard.....	36	Contrecœur.
10	Joseph Langlois.....	29	Pointe-aux-Trembles (en bas)
11	Edouard Perrault.....	34	Deschambault.
12	Lydoric Bouillé.....	27	do
13	Elié Bouillé.....	25	do
14	N. Edson Angers.....	34	do
15	Honore Dusseau.....	31	do
16	Narcisse Paquet.....	30	do
17	Jean Baptiste Nadeau.....	26	Levis.
18	Arthur Brière.....	27	Portneuf.
19	Aubert Naud.....	30	Deschambeault.
20	J. Sifroy Labranche.....	28	Portneuf.
21	Alexis Perrault.....	22	Deschambault.

It is satisfactory to be able to state that only two accidents to vessels occurred during the season, into the causes of which it was deemed necessary to hold investigations.

On the 21st October the S. S. "Lake Huron," belonging to the Beaver Line of Steamships, while on her way up

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from Quebec in charge of Pilot Jos. Chandonnet, grounded at Pointe-aux-Trembles (en haut). She was floated after a short detention without having sustained any apparent damage.

After hearing the evidence in the case the Commissioners decided that the Pilot was not to blame in the matter.

On the following day the S. S. "Lake Champlain," of the same line of Steamships, while on her way from Montreal to Quebec, in charge of Pilot Louis Bélisle, grounded in the Lavaltrie Channel. The vessel was obliged to discharge several hundred tons of her cargo and was floated on the 26th October, and proceeded to Quebec. She sustained no serious damage.

At the investigation, the Pilot admitted that he had made a mistake and had taken the wrong Channel. In view of this admission of the Pilot and in consideration of the previous satisfactory performance of his duties extending over a number of years, the Commissioners decided to suspend him until the 1st July, 1885.

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

QUEBEC TO MONTREAL AND VICE VERSA.	DOWNWARDS.	UPWARDS.
Pilotage of Vessels in tow of Steamers, 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 the Current of St. Mary into the Harbour..	5.00	5.00

The amount received by the Commissioners as the Pilotage authorities of this District, was as follows :—

For poundage, 5 per cent. on the earnings of Pilots	\$2,077.48
" Sundry poundage from Three Rivers for 1883	66.71
" Sundry poundage	5.05
Interest on investments	1,905.00
	<hr/>
	\$4,054.24
 The disbursements for Pensions to old and infirm Pilots and widows of Pilots were	 \$3,131.61

I have the honour to be,

Sir,

Your obedient servant,

H. D. WHITNEY,
Secretary.

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REPORT
UPON THE
DEEPENING OF THE SHIP CHANNEL
BETWEEN
MONTREAL AND QUEBEC,
FOR THE YEAR 1884.

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

HARBOUR COMMISSIONERS OF MONTREAL,
CHIEF ENGINEER'S OFFICE,
MONTREAL, 9th March, 1885.

H. D. WHITNEY, Esq.,
Secretary,
Harbour Commissioners of Montreal.

SIR,

I beg to submit, for the information of the Harbour Commissioners, the following report upon the work accomplished during the year 1884, in deepening the Ship Channel between Montreal and Quebec.

The work in hand is, in general terms, the deepening of the Channel from 25 feet, its present depth except at Cap à la Roche, to $27\frac{1}{2}$ feet deep at low water, and 300 feet in breadth in accordance with Act 46 Vic. cap. 36. The $2\frac{1}{2}$ feet increase of depth is, as a rule, being taken out by the dredges at a single cut over the whole breadth of the channel. Large sections are already finished, but they are, of course, of little benefit to navigation till the deepening is completed throughout. At Cap à la Roche, the shallowest point in the channel, an exception was, however, made, in order to afford the earliest possible relief to navigation,

and the work was so arranged that a light cut was carried through the shoal, before low water in the fall. This allowed of public notice being given on 1st October, that "the south, or new Cap à la Roche Ship Channel has been recently deepened and tested in the north half of its breadth to $21\frac{1}{2}$ feet, at lowest water, equal to $26\frac{1}{2}$ feet with a good average tide, or $1\frac{1}{2}$ feet deeper than formerly."

A semaphore was erected on the high ground at Cap-à-la-Roche in the early part of the summer and put into operation in August, before the time of low water. By its vessels approaching Cap-à-la-Roche are informed of the depth of water in the channel and every change of three inches in the depth is indicated.

The following are the chief details of the work done during the past year :

Cap Charles.—Dredging was commenced on July 12th, and continued till September 1st, with one dredge, assisted when requisite by a stone-lifter. The north half-breadth of the channel was deepened to 26 feet 3 inches at low water throughout 1,400 feet of its length. Nearly the whole of the cut was in shale rock, 3 feet and under in depth, and the remainder was in boulders, with a small proportion of clay and gravel. Quantity dredged 24,818 c. yards shale rock, scow measurement, and 133 c. yds. boulders, in all 24,951 c. yds., costing \$11,384, or $45\frac{5}{8}$ cents per yard.

Pouillier Rayer.—Work was carried on with one stone-lifter, working night and day, from May 19th to November 8th, and with one dredge, assisted occasionally by a stone lifter, from May 19th to October 11th, during which time 1,950 feet of the north half, and 1,200 feet of the south half of the channel were cleared of loose surface boulders, and 1,700 feet of the north half was dredged to 26 feet depth at low water. The boulders were thickly strewn and of all sizes up to 10 cubic yards, or about 20 tons weight. The

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dredging consisted of very tough hard-pan clay, with many boulders imbedded, these also of all sizes up to 20 tons weight. Quantity dredged 42,915 c. yards, costing \$16,746, or 39 cents per cubic yard; boulders lifted 3,625 cubic yards, costing \$3,378, or 93 cents per cubic yard.

Cap-à-la-Roche.—Work was carried on with one dredge from May 11th to July 28th, and from July 28th to November 9th, with two dredges, assisted occasionally by a stone-lifter, during which time 1,900 feet in length of the north half, and 1,500 feet in the south half breadth were deepened to 25 feet at low water. The dredging was all in shale-rock, and the depth of cut varied from one to four feet. Quantity dredged 78,517 cubic yards, costing \$36,522, or 46½ cents per yard, scow measurement.

As already mentioned, some parts of the north half of the channel, which afforded a clear depth for navigation of only 20 feet at lowest water, were cut through in the early part of summer and tested to 21½ feet, and opened to navigation at this depth on 1st October.

Lake St. Peter.—Work was commenced on May 15th, and continued to July 18th with one dredge, when another was added, and both continued till October 9th. The dredging was started at the lower end of the curve at Point du Lac, and carried upward to 2¼ miles above No. 3 Lightship, or a distance in all of 3⅔ miles with 27½ feet depth at low water, and a breadth of 450 feet on the curve and 300 feet on the straight line. The cutting was tough clay in the curve, gradually softening above No. 3 Lightship to the ordinary soft clay of the Lake. Quantity dredged 490,830 cubic yards, costing \$26,448, or 5⅜ cents per yard.

Contrecaur, New Channel.—At the extreme lower end of the Channel, below Isle St. Ours, a distance of 440 feet was dredged to 27½ feet depth, and 300 feet in width.

At the bend, and a short distance above it, on the main cutting, two sections of the south half breadth $\frac{7}{10}$ miles long in all, were dredged out to $27\frac{1}{2}$ feet depth, and 150 to 250 feet in width. Quantity lifted 90,930 cubic yards, tough clay with some boulders; cost, \$7,841 or $8\frac{5}{8}$ cents per yard.

Pointe-aux-Trembles (en haut).—From October 10th to December 1st., dredging was carried on with one to three dredges; several detached pieces, amounting in all to $\frac{3}{4}$ of a mile in length, of 300 feet in width were deepened to $27\frac{1}{2}$ feet at low water. A small piece of 250 feet in length by 100 to 150 feet in width was of soft but solid limestone rock, and all the rest was of moderately tough clay, with many boulders in the surface cuts where dredging had not been previously done. Quantity dredged 3,945 cubic yards rock, costing \$5,316, or \$1.34 $\frac{3}{4}$ per yard, and 79,140 yards clay and boulders, costing \$11,696, or 14 $\frac{3}{4}$ cents per yard.

Longueuil.—At the bend opposite the village a small piece of very hard dredging, consisting of boulders of all sizes, bedded in tough clay and gravel, was taken out by an elevator dredge, and a stone-lifter working in October. Quantity raised, 1,298 cubic yards, costing \$1,822, or \$1.40 per yard.

Montreal.—In the Ship Channel through the Harbour, and chiefly on the south bank off Victoria Pier and Island Wharf; a quantity of dredging was done by two spoon dredges of the Harbour fleet, assisted by the stone-lifters of the Ship Channel fleet, and off section 36, Hochelaga, a small shoal was worked upon by an elevator dredge of the latter fleet. Total quantity 22,438 cubic yards, chiefly gravel and boulders, costing \$12,252, or $54\frac{1}{2}$ cents per yard.

Tabular abstracts of the quantities dredged at the foregoing places and by the different dredges, together with other information as to the work, will be found annexed.

DREDGING PLANT AND EXPENSES.

In the estimates for continuing the deepening of the Channel from 25 to 27½ feet, it will be remembered that a sum of \$60,000 was set aside for extraordinary repairs and renewals, and more particularly for remodelling some of the dredging vessels, and making such improvements in them as experience shewed to be desirable on undertaking so large a work. In order to carry out the designs for this purpose as economically as possible, and also to take advantage of the latest available improvements in dredging machinery, some of the most notable dredges at work and under construction in England and part of Europe were examined by me early last winter, and orders were placed, under the authority of the Board, for steel castings and such other materials as required to be imported. Nearly all the machinery, except the engines of three elevator dredges, was then renewed, two of them being specially fitted up for dredging rock, and one for dredging clay; a number of minor changes and renewals were also made in other vessels of the fleet, details of which will be found below. The expenditure for changes and renewals as distinct from ordinary repairs, and maintenance is \$54,148.

The changes in plant have proved satisfactory and will much expedite the work. The two new rock-working dredges, with new machinery, now take a cut of four or five feet deep in the shale rock, and their working capacity averages about three times faster than formerly. The dredge for clay work has been delayed by breakage in some faulty steel castings, which will be obviated by repairs this winter; but as it is, the average working capacity was twice as great as formerly.

The year's outlay on working account, that is excluding the special renewals described, but including everything for ordinary repairs, outfit, fuel, wages, salaries, insurance and every expense, except interest and depreciation of plant, was for the Ship Channel fleet proper, \$122,519, and for

the Montreal Harbour fleet employed in the Channel, \$11,244, or in all \$133,763. The quantities dredged are : 705,255 cubic yards of earth, and 111,137 yards of rock and large boulders, making an aggregate of 816,682 cubic yards. Compared with previous years since the commencement of dredging for the 25 feet channel, the cost and quantity of work done is as follows :—

YEARS.	NUMBER OF DREDGES.	QUANTITY DREDGED. CUBIC YARDS.	TOTAL COST.	AVERAGE COST PER CUBIC YARD.
1875.....	7 Elevators.....	820,773	\$134,744	16 $\frac{4}{100}$ Cents.
1876.....	8 ".....	922,808	130,744	14 $\frac{1}{100}$ "
1877.....	7 to 8 ".....	1,262,308	137,830	10 $\frac{8}{100}$ "
1878.....	8 Elevators.....	966,973	\$124,891	12 $\frac{9}{100}$ "
	1 to 3 Spoons.....	117,663	24,125	20 $\frac{2}{100}$ "
	Total and Average..	1,084,636	\$149,016	13 $\frac{8}{100}$ "
1879.....	8 Elevators.....	813,391	\$135,519	16 $\frac{66}{1000}$ "
	2 to 5 Spoons.....	29,819	7,835	26 $\frac{35}{1000}$ "
	Total and Average..	843,210	\$143,354	17 "
1880.....	8 Elevators.....	1,171,757	\$136,537	11 $\frac{65}{1000}$ "
	2 to 4 Spoons.....	47,474	10,500	22 $\frac{11}{1000}$ "
	Total and Average..	1,219,231	\$147,037	12 $\frac{3}{1000}$ "
1881.....	8 Elevators.....	1,375,251	\$149,141	10 $\frac{84}{1000}$ "
	1 to 4 Spoons.....	78,537	18,160	23 $\frac{12}{1000}$ "
	Total and Average..	1,453,788	\$167,301	11 $\frac{42}{100}$ "
1882.....	7 Elevators.....	824,932	\$151,223	18 $\frac{36}{1000}$ "
	3 to 4 Spoons.....	74,303	20,981	28 $\frac{73}{1000}$ "
	Total and Average..	899,235	\$172,204	19 $\frac{16}{1000}$ "
1883.....	6 Elevators.....	360,344	\$121,325	33 $\frac{66}{1000}$ "
	2 to 5 Spoons.....	137,047	40,690	29 $\frac{59}{1000}$ "
	Total and Average..	497,391	\$162,015	32 $\frac{57}{1000}$ "
1884.....	6 Elevators.....	816,392	\$122,163	14 $\frac{26}{1000}$ "
	2 Spoons.....	22,197	11,244	50 $\frac{26}{1000}$ "
	Total and Average..	838,589	\$133,407	15 $\frac{21}{1000}$ "

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The measurement of the quantity dredged is by tally of the scows, which, when filled level, hold 80 to 150 cubic yards, for the ordinary and large sizes respectively, but are reckoned at 60 and 120 cubic yards each to allow for imperfect filling.

The working plant employed consisted of the following vessels :—

- Two Elevator Dredges with cast steel buckets for rock, Nos. 11 and 13.
- One “ “ “ large built buckets for rock, No. 8.
- One “ “ “ small “ “ “ No. 10.
- Two “ “ “ large buckets, for clay, &c., Nos. 9 and 12.
- Two Spoon Dredges, during part of the summer.
- Seven to Nine Screw Tugs.
- Two Stone Lifting Barges, Nos. 1 and 2.
- Five Barges as coal tenders and smiths' shop.
- Thirteen hopper bottom scows.
- Four flat deck scows.

Three of the elevator dredges, and the two stone-lifters, commenced work at dates between May 15th and 20th, and the remaining three elevator dredges were detained by alterations until dates between June 25th and July 18th, and all continued work until Nov. 26th and December 1st. Stone-lifter No. 2, worked night and day from May 19th to October 31st, and the remainder of the plant worked as usual, during day only.

The number of days during which the dredges were on duty, reckoning all except Sundays, from the date of leaving winter quarters to that of returning, was from 117 to 171, and the aggregate for the six dredges during the season was 885 days, or an average of 148 days each. The time of the stone-lifters on duty was 162 days for the one which worked during the day only, and 281 days for the other, counting a night and day as two days.

The nominal working time during the long days of summer is 12 hours per day, but the actual dredging time

is reduced by short days in autumn, early stoppages on Saturdays, time lost in storms, changing positions, accidents, repairs and delays of all kinds, so that the time during which the dredges were actually dredging was 6,676 hours, or an average of 7.56 hours per day for the whole season.

The dredges and tugs were laid up during the winter of 1883-4 at the Harbour Commissioners' shipyard, Sorel, and the alterations and necessary repairs were, as usual, done at the Commissioners' works.

The barges, scows and other vessels without machinery were chiefly wintered at Chenal du Moine about 6 miles below Sorel.

The following are the principal alterations and repairs made during the year.

Dredge No. 8.—New A frame with new platform on top; legs of engine-frame spliced; new tie rods from upper end of engine frame to kelson forward; new shear strake on one side; half new covering board; half new deck; new frames and deck around smoke stacks; new floor in fore-castle and engine room; top sides and deck caulked. New upper tumbler; new shaft in lower tumbler; new truss rods in bucket frame; new sprocket wheels in bucket frame winch and bow winch; new pipes for chute pump; chute repaired; boiler caulked; new check valves; flanges of cylinders and steam chests lined with brass; new ends on main valve spindles; new brasses in engine frame; sundry small repairs.

Dredge No. 9.—Buckets of four cubic feet capacity replaced by a new chain of 27 cubic feet each, involving the rebuilding of the bucket-frame and nearly all the machinery except the engines. The chief details of the alterations are as follows:—

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New A frame with new platform on top ; engine frame repaired above and below deck ; new brackets in engine frame ; new foundation for chute ; new bulkheads ; partitions on side of well replaced by new ones ; twelve new stanchions ; part new shear strake ; new floor in forecastle, kitchen and under engine room ; about one quarter of deck made new ; deck, and top sides caulked. Dredge docked in November, for repairs below water line. New main spur wheels on upper tumbler shaft ; new set of built steel buckets, of 27 cubic feet capacity, with intermediate steel links and connecting pins complete ; new upper and lower tumblers and new shaft for lower tumbler ; new set of rollers and boxes in frame ; bucket frame rebuilt, and about one-third the timber renewed, lower end castings replaced by others of new form and large straps altered to suit new brackets for main truss ; deadeyes shifted ; new upper and lower sheaves, blocks, side chain and connections for lifting bucket frame ; new sprocket and intermediate wheel for bucket frame winch and all new connections to cross beam ; new steam breasting winch in bow ; new bow breasting chains and new chocks for same ; new pinion and spur wheel for winch ; one new piston ; new friction bands ; new brass in cross-head ; new piston and slide fitted up ; new chute, smoke-stacks lengthened ; part of tubes in boiler renewed ; boilers caulked.

Dredge No. 10.—Half of deck and three-quarters of railing renewed ; new stanchions and covering board ; new shear strakes on both sides ; new strake in planking below shear strake on both sides ; new floor in forecastle and engine room ; legs of A frame pieced and new cross beam put on ; light repairs to bucket frame and engine frame ; deck caulked ; dredge docked in November for repairs to hull below water line. Twenty-five buckets repaired ; tumbler bars refitted ; new sheaves in hoisting

blocks; two new rollers and four new shafts in bucket frame; pistons of main engines faced and fitted up; new cylinder cover on steam pump; new piston for bucket frame winch; new feed pipe from seacock to feed pump; forward winch pistons fitted up; new bevel wheel on breasting winch; new bevel wheel on shafting; forward shafting rebabbitted; truss rods taken off and strengthened; sundry smaller repairs to various parts of engine and other machinery.

Dredge No. 11.—Boiler plate toothed buckets of 4 cubic feet capacity replaced by a new chain of solid cast steel buckets armed with teeth of unusual strength for dredging unblasted rock. This change involved also a new bucket frame and lifting gear, new main driving gear, and the renewal of all the principal working parts, the whole being of new design and greatly increased strength. The following are the chief alterations:—

New A frame; new wooden frame for bow cable drum and for drum of bucket frame cable; new frame for bow anchor sheave; new foundations for four winches; new bulkhead for coal bunker; new blocking under chute and bulkhead, between it and engine room; new water closet and lamp room; new floor in fore-castle and engine room; sundry alterations and repairs to other parts of joiner work; half new deck and covering board; new shear strake on both sides; 12 new stanchions; top sides and deck caulked.

New set of cast steel buckets, with new cast steel intermediate links and link pins complete; new bucket frame with new bucket rollers and all other attachments except main straps at ends; new upper and lower tumblers and new lower tumbler shaft; one new deadeye; new winding drum for bucket frame cables with friction brake attachments, gearing, pitch chain and connections com-

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plete; new winding drum for bow cable with gearing and connections; new steel wire bow cable and breasting chains with new sheaves and blocks, also new steel wire cable for hoisting bucket frame with new sheaves, blocks and attachments to A frame and bucket frame; new steam breasting winches in bow and stern to replace winches driven from main engines; new ends on valve spindle of main engine; new piston followers; new check valve; new brass bushes for after breasting winch: two new smoke stacks; boiler repaired.

Dredge No. 12.—New A frame and new platform on top; legs of engine frame spliced and braced; new foundations for after winch; about three-quarters of deck renewed; new frame and deck around smoke stacks; 12 new stanchions; part new rail; new shear strakes and two new strakes below; new water closet and lamp room; two new pantries; new floor in forecastle and engine room; top sides and deck caulked. Part new bucket frame steel bushes changed in all the buckets and links; two new sprocket wheels for bucket frame winch; one new pinion for forward winch; pistons of main engines faced and fitted up with new rings; winch link motion fitted up with new link blocks and pins; smoke stacks repaired; 15 extra screw stays put into boiler.

Dredge No. 13.—This dredge has been altered and fitted with a chain of solid cast steel buckets the same as those of dredge No. 11, and the main alterations and additions to frames, dredging machinery, etc, described for No. 11 apply equally to this dredge. The ordinary repairs consist of a new floor in forecastle and engine room; new water closet and lamp room; two new pantries; new bulkheads on both sides of well; back of mess room repaired; new rail and stanchions on one side; top sides and deck caulked. Links and link blocks of main engine repaired; winch

links fitted up with new steel blocks; new rings on water plunger; smoke stacks lengthened; boilers repaired and caulked.

Dredge No. 3.—This dredge has not been worked this year, but it was found necessary, in November, to dock her for caulking below water line.

The following buckets, links, pins, &c., were repaired or made, and distributed amongst the dredges as required.

- 12 links welded for dredges.....Nos. 8 and 12.
- 18 cast steel links bored and bushed..... “ “ “
- 26 wrought-iron links bored and bushed “ “ “
- 60 large bushes made..... “ “ “
- 1 large-sized bucket bushed..... “ “ “
- 160 large pins cut and beaded..... “ “ “
- 180 new pins made for dredges.....Nos. 10, 11 and 13.
- 30 new small teeth made..... “ “ “ “
- 36 old teeth repaired..... “ “ “ “
- 12 buckets repaired with new lips “ “ “ “
- 12 buckets repaired with new lips and teeth..... “ “ “ “
- 51 buckets otherwise repaired..... “ “ “ “
- 3 pairs of double links repaired... “ “ “ “
- 2 buckets for dredge No. 9 received new bottoms.
- 2 large teeth made for dredge No. 8.

Tug St. James. — Slight repairs to hull; new coal bunkers; top sides and deck caulked. Cylinder renewed and piston fitted in; two new blades for propellor; one pair new couplings on shaft, and new piece of shaft next crank disc; heaters for rooms repaired; 40 new cross stays put in boiler; other light repairs to engine and boiler.

Tug St. John.—Inside of wheel-house taken down to remove boiler and put up anew; light repairs to hull; top sides and deck caulked. Light repairs to engine; boiler

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tubes taken out, cut and welded; top of boiler shell riveted; three patches on boiler; all crow-feet of stays taken out and put on with heavier rivets; main flues strengthened with angle iron rings, conformably to new Government regulations.

Tug St. Francis.—Three quarter new deck; new rail on one side; new windlass frame; guards repaired; new coal bunkers; top sides and deck caulked; New cylinder cover and wrought-iron band put on cylinder, general repairs to engine; boiler strengthened and repaired similar to that of tug *St. John*.

Tug C. J. Brydges.—Light repairs to deck and hull; top sides and deck, caulked; new piston followers; link and link-blocks fitted up. Hauled out for repairs in winter 1884-5.

Tug Minnie F. Parsons.—Five new deck beams; part new coanings; two new tow-posts; half new main deck; new kitchen; new cabin; new upper deck; docked in November for repairs below water line; Pistons fitted up; new deck valve; new funnel; boiler caulked.

Tug Delisle.—Inside of wheel-house taken down and replaced; new upper deck, new kitchen floor; new bunkers; light repairs to hull; top sides and deck caulked; pistons faced and fitted up; new built-up crank; shaft and link fitted up; both flue sheets renewed; new flues; tubes taken out and repaired; all crowfeet of stays taken out and put on with heavier rivets; 13 new extra stays. Hauled out for repairs in winter 1884-85.

Tug John Pratt.—Part new upper-deck; new floor in cabin; new bunkers; new covers over boiler; light repairs to main deck and hull; top sides and deck caulked; pistons faced and fitted up; other general repairs to engine; new front tube sheet to boiler; new door and

frame, two new sides to furnace and part new crown sheet, strips on back tube sheet; tubes all taken out, cut and welded, all the crow feet of stays taken off and put on with heavier rivets; other light repairs to boiler; smoke stacks repaired. Hauled out for repairs in winter 1884-85.

Stone-lifter No. 1.—Hauled out and wintered on slip; light repairs to hull and deck; new sky-light; two new coal boxes; rail repaired; deck and hull caulked; grips repaired; other general repairs. Hauled out for repairs in winter 1884-5.

Stone-lifter No. 2.—Part new deck, shear-strake, rail and covering-board; top sides and deck caulked. Winch links fitted up; new three-sheaved bracket; grips repaired; set of new tubes in boiler repaired. Hauled out for repairs in winter 1884-5.

Barge Waverly.—New planking from water-line up; new deck and ribband; part new timbers; top sides and deck caulked.

Barge Caroline.—New planking from water-line up; new ribband; new rail and deck; top sides and deck caulked.

Barge A. J. Nish.—The engines and boilers of the chain tug A. G. Nish were taken out in the fall of 1883, and the hull was, during the following winter, converted into a work shop and store ship, involving the following repairs and additions:—

New planking from water-line up and new ribband all around; part new timbers, six new beams; new deck, rail, mast and gaff, and frame for winch, new after cabin, companion way, hatches, water-closet, ceiling and sky-light; large coal boxes, part house on deck made new; store-room fitted up in bow; new work-bench, oil-stands, and two new bellows frames.

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Scows.—Eleven scows repaired. Three received new ends, light general repairs and caulking; eight, light repairs and caulking. Seven scows hauled out for repairs during the winter of 1884-85.

Buoys and Beacons.—The buoys of the Ship Channel have been maintained as usual, under the immediate care of the Superintendent of Pilots.

Yours respectfully,

JOHN KENNEDY,

Chief Engineer.

DREDGING PLANT employed in Deepening the SHIP CHANNEL between MONTREAL and QUEBEC in 1884.

DESCRIPTION OF VESSELS.	HULLS.				When built	Tonnage Register.	ENGINES.				REMARKS.	
	Length over all,	Breadth of Beam,	Depth of Hold,	ft. in.			No. of Cylinders,	Diam. of Cylind.	Length of Stroke,	Pres're of Steam,		Capacity of Bucket,	Depth to which dredge work.
DREDGES.												
Elevat'r Dredge No. 8.	135 0	29 0	10 0	1874	.....	2	20	32	70	16	37	Wooden hull,
" " " " No. 9.	135 0	29 0	10 0	1874	.....	2	20	32	70	28	37	" "
" " " " No. 10.	135 0	29 0	10 0	1874	.....	2	20	32	70	4	35	" "
" " " " No. 11.	135 0	29 0	10 0	1874	.....	2	20	32	80	6½	38	" "
" " " " No. 12.	135 0	29 0	10 0	1874	.....	2	20	32	70	16	38	" "
" " " " No. 13.	135 0	29 0	10 0	1874	.....	2	20	32	80	6½	38	" "
STEAMERS AND TUGS.												
Minnie F. Parsons	76 0	15 0	6 6	1864	22 42	1	18½	20	80	.....	.....	Wooden hull.
Delisle	62 5	14 9	7 3	1869	17 07	1	18	20	90	.....	.....	" "
John Pratt	96 0	19 2	7 3	1874	21 41	2	14	16	77	.....	.....	" "
C. J. Brydges	62 2	16 0	8 0	1874	21 23	1	20	22	85	.....	.....	" "
St. Francis	80 0	17 0	7 9	1875	37 43	1	20	22	85	.....	.....	" "
St. John	80 0	17 0	7 9	1875	37 43	1	20	22	80	.....	.....	" "
St. James	76 0	17 0	8 2	1875	54 57	1	21	20	85	.....	.....	" "
BARGES.												
Caroline	103 8	22 6	3 3	1864	132 95	.....	.....	.....	.....	.....	.....	Wooden hull.
Dreadnaught	104 2	21 5	7 4	1869	136 42	.....	.....	.....	.....	.....	.....	" "
Waverly	100 0	20 11	7 1	1870	176 00	.....	.....	.....	.....	.....	.....	" "
Alfred Demers	105 0	22 5	7 6	1878	131 01	.....	.....	.....	.....	.....	.....	" "
A. G. Nish (float g ship)	100 8	25 6	6 4	1873	.....	.....	.....	.....	.....	.....	.....	" "
Stone Lifter No. 1	65 0	22 0	6 0	1858	.....	.....	.....	.....	.....	.....	.....	" "
No. 2	75 0	24 0	9 3	1878	.....	.....	.....	.....	.....	.....	.....	" "
SCOWS.												
7 Hopper-bottomed	80 0	16 0	6 9	1874	Scow No. 33 to 44	.....	.....	.....	.....	.....	.....	4 hoppers.
2 " " "	54 6	18 0	7 0	1875	47 and 48	.....	.....	.....	.....	.....	.....	2 " "
2 " " "	50 0	19 9	7 3	1876	49 " 50	.....	.....	.....	.....	.....	.....	2 " "
2 " " "	89 0	18 0	7 9	1879	51 " 52	.....	.....	.....	.....	.....	.....	2 " "
2 " " "	89 0	18 0	7 9	1880	53 " 54	.....	.....	.....	.....	.....	.....	2 " "
4 Flat scows	89 0	18 0	7 9	1880	53 " 54	.....	.....	.....	.....	.....	.....	3 " "
					10 " 17	.....	.....	.....	.....	.....	.....	3 " "

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

ABSTRACT OF WORK done by each DREDGE in deepening the SHIP CHANNEL between MONTREAL and QUEBEC in 1884.

VESSELS.	Places at which Dredging was done.	Time of Service Days.	QUANTITIES DREDGED.				Totals.	REMARKS.
			Spoon Dredges.	Elevators & Stone Lift's		Cubic Yards.		
				Earth.	Rock.			
Dredge No. 4	{ Ship Channel through } Harbour.....	120	18,068				{ Hard pan, gravel and sand.	
Dredge No. 7		16	4,129			22,197		
Dredge No. 8	Pouillier Rayer Pointe aux Trembles.....	128	42,915				Clay and hard pan. Clay and Stones.	
		30	30,330					
Dredge No. 9	Longueuil.....	13	1,275				Stiff clay and stones.	
		72	185,490			74,520		
Dredge No. 10	Lake St. Peter.....	45	44,940				Stiff clay and stones. Clay and stones.	
		125				230,430		
Dredge No. 11	Cap la Roche.....	30			20,130		Shale rock. Shale rock.	
		13			2,370			
Dredge No. 12	Cap Charles.....	84	3,870				Clay and stones.	
		24			24,818			
Dredge No. 13	Isle St. Ours.....	15	9,570				Shale rock. Shale rock. Sand, clay and stones.	
		127	305,340			45,443		
Dredge No. 13	Lake St. Peter.....	44	81,360				Stiff clay and stones. Sand, clay and stones.	
		120				386,700		
Stone-lifter No. 1	Contrecoeur.....	10			47,310		Shale rock. Shale rock. Small stones.	
		7			1,575			
Stone-lifter No. 2	Cap la Roche.....	28	168				Boulders. Boulders.	
		98				178		
Stone-lifter No. 2	Longueuil.....	12					Boulders. Boulders.	
		262			3,625			
Totals	Pouillier Rayer Montreal.....	6			76		Boulders. Boulders.	
		1,427	2,2197	705,255	111,137	838,589		

STATEMENT showing the number of days worked and the quantity DREDGED at each place in deepening the SHIP CHANNEL between MONTREAL and QUEBEC in 1884.

PLACES WHERE DREDGES WORKED.	VESSEL.	Days.	Total Days.	QUANTITIES DREDGED.			Totals.	REMARKS.
				Spoon Dredges.	Elevators, Etc. Earth.	Rock.		
Cap Charles.....	Dredge No. 11.....	84	84	.....	.....	24,818	.....	Shale rock and boulders.
	Stone-lifter No. 1.....	28	112	.....	.....	133	24,951	
Pouillier Rayer.....	Dredge No. 8.....	136	136	.....	.....	42,915	.....	Clay, hard pan and boulders.
	Stone-lifter No. 2.....	262	388	.....	.....	3,623	46,540	
Cap la Roche.....	Dredge No. 10.....	125	125	.....	.....	20,130	.....	Shale rock and boulders.
	" 11.....	24	149	.....	.....	11,055	.....
	" 13.....	120	367	.....	.....	47,310	78,517	
Lake St. Peter.....	Stone-lifter No. 1.....	98	98	.....	.....	22	.....	Stiff clay and stones.
	Dredge No. 9.....	72	170	.....	.....	185,490	490,830	
Contrecoeur, Isle St. Ours.....	Dredge No. 12.....	127	127	.....	.....	305,340	.....	Sand, clay and stones.
Do. (Main Cutting).....	Dredge No. 11.....	15	142	.....	.....	9,570	90,830	
Pointe aux Trembles.....	Dredge No. 12.....	44	44	.....	.....	81,360	.....	Clay and stones.
	Dredge No. 8.....	30	74	.....	.....	30,330	79,140	
	" 9.....	45	119	.....	.....	44,940	.....	Hard shale rock.
	" 10.....	13	132	.....	.....	3,870	3,945	
	" 11.....	30	162	.....	.....	2,370	.....	Stiff clay and stones.
	" 13.....	10	172	.....	.....	1,575	1,268	
Longueuil.....	Dredge No. 8.....	13	13	.....	.....	1,275	.....	Hard pan, gravel, sand, small stones and boulders.
	Stone-lifter No. 1.....	12	25	.....	.....	23	22,197	
Montreal.....	Dredge No. 4.....	190	190	.....	.....	18,068	.....	.....
(Ship Channel through Harbour).....	" 7.....	16	206	.....	.....	4,129	.....
	" 13.....	7	213	.....	.....	165	.....	.....
	Stone-lifter No. 2.....	6	219	76	838,589	
Totals.....		1,427	1,427	22,197	705,255	111,137	838,589	

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TARIFF.

Rates & Dues to be levied in the Harbour of Montreal,

Under and by virtue of the Acts 40 Vic. Cap. 53, and 42 Vic. Cap 28.

ON AND AFTER THE FIRST DAY OF APRIL, 1881.

Tonnage Dues

To be levied on all vessels in the Harbour.

- On Steamboats, for each day of twenty-four hours, or part of a day, they remain in the Harbour reckoned from the hour of their arrival to that of their departure.....1c. per Ton Register.
 On all other vessels, per day, as aforesaid.....½c. " " "

Wharfage Dues

To be levied on all Merchandise, Animals and things whatsoever Landed or Shipped in the Harbour.

- 25c. per Ton—All Goods, Wares and Merchandise not elsewhere specified.
 20c. " " —Hay, Straw, Pig and Scrap Iron, Pot and Pearl Ashes.
 15c. " " —Apples, Crates and their contents, Flour and Meal, Fish, Meats, Pitch, Potatoes, Tar, Horses, Neat Cattle, Sheep, Swine.
 10c. " " —Ballast, Clay, Fire-Bricks, Gypsum, Lime, Marble, Phosphates, Sand, Salt.
 7½c. " " —Coal and Coke, Grain and Seeds of all kinds.
 Special..... Bricks, 10c. per 1,000 ; Cordwood, 5c. per cord ; Lumber, 10c. per 1,000 feet, board measure.
 Free..... Bullion, Specie.

On all Goods, Wares and Merchandise whatsoever, the quantity of which by weight, measurement or other mode of estimate provided for in the Tariff, cannot be conveniently ascertained, it shall be lawful for the Harbour Commissioners to levy a rate of ¼ of 1 per cent. on the value thereof.

Each entry shall pay not less than 5 cents.

All property landed on the wharves for re-shipment, shall only pay one wharfage.

The Ton mentioned in the Tariff of Wharfage Dues shall be 2,000 lbs. weight, or 40 cubic feet measurement, according to the Bill of Lading.

STANDARD FOR ESTIMATING WEIGHTS.

Ashes, Pot or Pearl.....	3 brls to 1 Ton.	Horses.....	2 to 1 Ton.
Apples, Flour, Meal, Potatoes.	9 " " "	Neat Cattle.....	3 " "
Fish, Meats Pitch, Tar.....	7 " " "	Sheep.....	15 " "
		Swine.....	10 " "

Certified,

H. D. WHITNEY,

Secretary.

HARBOUR COMMISSIONERS OFFICE,
 MONTREAL, 26th March, 1881. }

PRIVY COUNCIL OFFICE,
 OTTAWA, 1st April, 1884.

I hereby certify that the foregoing Tariff has been approved by His Excellency the Governor-General in Council on this 1st day of April, 1881.

J. O. COTÉ, *Clerk, Privy Council.*