

ANNUAL REPORTS
OF THE
HARBOUR COMMISSIONERS
OF MONTREAL
FOR THE YEAR 1890.



Commissioners :

HENRY BULMER, Esq., CHAIRMAN.

HON. EDWARD MURPHY.

VICTOR HUDON, Esq.

J. O. VILLENEUVE, Esq.

RICHARD WHITE, Esq.

HUGH McLENNAN, Esq.

CHARLES H. GOULD, Esq.

JACQUES GRENIER, Esq., MAYOR.

ANDREW ALLAN, Esq.

ALEXANDER ROBERTSON, SECRETARY.
JOHN KENNEDY, M. INST., C.E., CHIEF ENGINEER.
CAPTAIN THOMAS HOWARD, HARBOUR MASTER.
CAPTAIN LOUIS ST. LOUIS, DEPUTY HARBOUR MASTER.
JOHN FERNS, WHARFINGER AND PAYMASTER.

Montreal :

PUBLISHED BY ORDER OF THE HARBOUR COMMISSIONERS OF MONTREAL,
1891.

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J. O. VILLENEUVE,
RICHARD WHITE, J

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While these
Esquire, ex-Mayor
James McShane
City's interests of
follows for 1891

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HON. EDWARD MURPHY

VICTOR HUDON, ESQ.

J. O. VILLENEUVE, ESQ.

RICHARD WHITE, ESQ.

ALEXANDER

JOHN KENNEDY

CAPTAIN THOMAS

CAPTAIN LOUIS

JOHN FERNS

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Harbour C

MEMORANDUM.

While these reports were in press Jacques Grenier, Esquire, ex-Mayor, resigned his seat and the new Mayor, James McShane, Esquire, was elected to represent the City's interests on the Commission, which is therefore as follows for 1891 :

Commissioners :

HENRY BULMER, Esq., CHAIRMAN.

HON. EDWARD MURPHY.

VICTOR HUDON, Esq.

J. O. VILLENEUVE, Esq.

RICHARD WHITE, Esq.

HUGH McLENNAN, Esq.

CHARLES H. GOULD, Esq.

JAMES McSHANE, Esq., MAYOR.

ANDREW ALLAN, Esq.

ALEXANDER ROBERTSON, *Secretary.*

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

CAPTAIN THOMAS HOWARD, *Harbour Master.*

CAPTAIN LOUIS ST. LOUIS, *Deputy Harbour Master.*

JOHN FERNS, *Wharfinger and Paymaster.*

*With the Compliments
of the
Harbour Commissioners of Montreal.*

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MR. HENRY

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Business of the

AT THE MEETING

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STATEMENT

MADE BY

MR. HENRY BULMER, CHAIRMAN,

HARBOUR COMMISSIONERS OF MONTREAL,

ON THE

*Business of the Port for the year 1890, and other matters
connected with the Trust,*

AT THE MEETING OF THE BOARD HELD ON 10TH FEBRUARY, 1891.

But a short time after the last statement of the chairman and the authorization of the publication of the Annual Reports, the Board had to regret the loss by death of its Chairman, Andrew Robertson.

Personally my relations with him were such that I felt the loss of an old friend, and that the Board had lost the benefit of the services of an energetic and faithful administrator of the trust confided to its keeping.

The minutes of the Board at its first meeting after the sad event expressed the sentiments of the Board as to the value of the services he had rendered to the Trust.

The vacancy on the Board was filled by the Government naming Mr. Richard White, who took his seat as Commissioner on the 22nd April last.

The term of office of Mr. Hugh McLennan, as representative of the Board of Trade on this Board, expired on the 4th of August, when he was again elected for another term.

Last spring, the Department of Marine and Fisheries, after having assumed the duty of maintaining the buoys and beacons between Montreal and Quebec, deemed it advisable to advertise for public tenders for that service. The contract was awarded to the Sincennes-McNaughton Line, and although much anxiety was felt in some quarters as to this service being placed in the hands of private parties, it is only just to say that the Contractors have shown every disposition to keep up the service to the required standard of efficiency and that they have been fairly successful in their efforts.

Under the charge of the Marine Department the same Company has continued the important Semaphore Service at Cap à la Roche, in a satisfactory manner, to the great advantage of the shipping interest.

During last summer the same Department placed floating lights at Ste. Croix and Pointe-aux-Trembles (en bas) which have proved useful and serviceable to pilots and saved valuable time to deep draught vessels, as they were enabled to pass those points by night instead of having to wait for day light as before.

The work on the 27½ feet channel has been continued by the Public Works Department. Only a portion of the excavation at Cap à la Roche now remains to be done to give that depth at all states of the tide between Montreal and Cap Charles. Below the latter point it has been ascertained that a few places will require some dredging to enable deep draught vessels to pass at low water.

In order that the full benefit from the expenditure already made on the channel may be derived, this additional work will doubtless follow.

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Another important change was made last winter in the disbanding of the Water Police Force by the Dominion Government and the exemption of vessels coming to Montreal from the payment of Police dues.

The Water Police Force had in the past rendered valuable services to the different interests in the Harbour, and the necessity for disbandment was looked upon with regret. The City Council promptly made arrangements for maintaining order and protecting property on the wharves, and it is due to the Chief of Police, officers and men, to say that in their first season's performance of those duties they have done them efficiently and with very general satisfaction to all concerned.

The Commissioners granted the Civic Police Committee the use of the basement of the Harbour Building, as a station for this special service.

A contract for the electric lighting of the wharves was given last spring to Messrs. Craig & Sons. The lighting, on the whole, was well maintained, considering the means at the contractors' disposal for the first year of the contract.

In the month of May the Department of Railways and Canals notified the Board that on the expiration of the notice required by the lease, the privilege of water power, leased for lighting purposes, would be withdrawn, as the Department required all the water power for its own purposes. In future therefore, the contractors will have to supply the power from other sources, which they say they are prepared to do.

Experience having shown that it was necessary to amend By-law No. 133 to ensure greater safety to navigation, eleven additional points, at which vessels ascending should wait for vessels descending, were added to the list previously provided for by the By-law. This amended By-law 133A, put in force early in June, has

given general satisfaction to the Trade and the Pilots. It is gratifying in this connection to be able to say that no accident of serious importance has, during the last year, occurred on the river between Quebec and Montreal, showing that, with proper care and watchfulness, the navigation between those points is safe and unattended with danger.

In the Harbour of Quebec the SS. "Lake Nepigon" whilst in charge of one of the Montreal Pilots ran into and sank the Barque "Isabel" in broad daylight. This was owing to gross carelessness, or want of judgment, on the part of the Pilot, and was dealt with accordingly by the Board.

At last session of Parliament a Bill was introduced granting a charter to build a bridge across the St. Lawrence at Isle Ronde, which, as presented, would have seriously interfered with the freedom of navigation. On representations being made on behalf of this Board the objectionable features of the proposed bridge were withdrawn and, as amended, it is not likely to interfere with shipping coming to the Harbour.

In the month of September last the Harbour was honoured by a visit from Admiral Watson with H. M. Ships "Canada" and "Thrush," the former commanded by Captain Dowding, and the latter by H. R. Highness Prince George of Wales.

In June last application was made by the Department of Marine for office accommodation for the Government Steamboat Inspector, and an arrangement was made by which that office is now in the premises of the Board.

The ordinary repairs of the wharves have been more extensive than usual, and more than usual attention has been directed to keeping the surface clean and in good order; a difficult matter owing to the heavy traffic on a

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poor foundation, unless something of a more permanent nature than macadam is used.

The want of a ramp road below the Longueuil Ferry, from the wharves to the City has been long felt, especially by the large coal trade done at that point, so much so that a road was forced across private property and used for some years back. This having been blocked by the owners, negotiations were opened between the City Council and this Board which resulted in an arrangement by which the City will acquire the land, and this Board will construct the road. It is hoped the necessary formalities for acquiring the land will be through so as to allow the completion of the road by the time the trade at that point will require it.

The dredging plant belonging to the Board has, from long use, become unfitted to the requirements of the Harbour, especially for the deep dredging. The Board, on the advice of the Chief Engineer, ordered the construction of a new powerful dredge, which, owing to various causes, was not completed last fall as intended. It is, however, now being pushed forward and is expected to be ready for work by the opening of navigation. This new dredge, should it come up to the calculations of Mr. Kennedy, will greatly add to the capacity of the plant and will be a compensation for the large outlay it has involved.

In this connection it may be said that the old Floating Shop, used for repairs during the summer, has become too small, and unsuitable in various ways. A new one on a larger scale was ordered, and the tools and machinery have been transferred from the old to the new shop. It is now lying alongside the Plant in the canal, and the usual spring repairs to the machinery of the Fleet will be done in it.

The position of Mechanical Engineer, vacant by the

death last winter of Mr. A. B. Savigny, was not filled, Mr. Kennedy having undertaken to perform the duties himself. In September it was deemed expedient to make a change, and Mr. M. Sharkey was appointed by the Board, Foreman of Dredging, and Mr. A. Lemay, Mechanical Foreman. Both have been long in the Board's employ and it is hoped that they will prove an efficient aid to the Chief Engineer in carrying on the works economically.

The new wharves ordered to be built at Hochelaga have not yet been completed, but considerable progress has been made. Mr. Kennedy reports 670 lineal feet of breast wharf below the Cotton Factory completed and ready for use; and 335 feet up to low water mark, leaving 365 feet of that section yet to build from the bottom. The new pier opposite the St. Lawrence Sugar Refinery is partly finished, and was used by shipping since September last; 680 lineal feet are completed, 585 feet up to low water mark, and 296 feet have yet to be built up from the bottom.

These wharves are expected to be completed during the coming season, and will provide accommodation for some time to come to the increasing trade in that end of the Harbour.

The agreement entered into in the previous year with the Grand Trunk Railway Company, by which the wharf tracks laid by the latter were sold to the Trust, was finally completed in May. As the indemnity to be paid the Grand Trunk Railway could not be agreed upon by the Grand Trunk Company's Engineer, Mr. E. P. Hanford, and the Harbour Engineer, Mr. John Kennedy, it was referred to an umpire, Mr. Walter Shanly, and the amount awarded having been paid all the tracks on Harbour property now belong to the Harbour Trust.

These tracks are now leased to two Companies, the Grand

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Trunk Railway and the Canadian Pacific Railway, each having its respective tracks. It has been the policy of the Board for years past to endeavor to bring the whole track system on the wharves under one control, so that the tracks should be available to their full capacity for facilities to the trade of the Harbour. This as yet has not been effected.

As will be seen from the official returns the steady increase in the volume of trade done at this Harbour is most gratifying; the Harbour Master's statement is certainly instructive and deserving the attention not only of those interested in the growth of the trade of Montreal, but also of those interested in the trade of the Dominion.

Taken by decades the following figures are noticeable:

Statement showing the number and tonnage of Ocean Steamers and Sailing Vessels that arrived in Port the following years:

Year.	Ocean going steamships.	Tonnage of ocean going steamships.	Ocean going sailing vessels.	Tonnage of ocean going sailing vessels.	Total No. of steam & sailing vessels.	Total tonnage of steam and sailing vessels.
1850	..	....	222	46,867	222	46,867
1860	32	47,385	222	74,174	254	121,559
1870	144	133,912	536	182,934	680	316,846
1880	354	475,741	356	152,530	710	628,271
1-90	624	889,189	122	41,143	746	930,332

These figures show the continued steady growth of the trade done in this Harbour and the facilities it offers as the point at which the Ocean and Inland traffic should meet. As the trade of the Dominion increases, so should the Harbour of Montreal provide for meeting the requirements of that increase.

The revenue of the Harbour from all sources the past year was \$263,239.59; the expenditure, apart from the outlay on new works, was \$199,960.30.

During that time \$140,000 debentures were issued to provide for the construction of the new wharves at

Hochelaga. The bonds, bearing interest at the rate of four per cent, were disposed of at from par to one per cent premium, net. The expenditure on new works, or capital account, during the year was \$155,579,23.

The necessity for increased accommodation for shipping in the Harbour has engaged the attention of the Board during the last year. The plan practically agreed upon by all the interests concerned, popularly known as Plan No. 6, was submitted to the Government for approval. Some objections were brought against it and in May last Messrs. John Page and Louis Coste were instructed to examine into and report upon the subject, with the result that they suggested that further information should be obtained. After a further representation against delay, the lamented death of Mr. John Page occurred, and after that an entirely new plan was sent to the Board, by the direction of the Hon. the Minister of Public Works, made by Mr. R. C. Lebrun, an Engineer of eminence in France.

Finally the Minister of Public Works directed his Chief Engineer, Mr. H. F. Perley, to take all the various schemes for Harbour improvement into consideration in connection with the prevention of floods at Montreal, and report upon them.

The result was a most elaborate examination of the whole question in his report, dated 17th November, 1890, and is an entire approval of the plan No. 6 A., adopted by the City and the Harbour Commissioners, and approved by the Board of Trade and the Shipping Interest.

On the recommendation of the Hon. Minister of Public Works, dated 26th November, an Order in Council was passed approving that report on the 17th of January, which was officially communicated to this Board on the 3rd instant.

Thus the long vexed question as to the best means of

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obtaining harbour enlargement has been brought to a decisive settlement, and it remains for the City Council and the Harbour Board to carry the plans into effect with as little derangement of trade as possible. Some inconvenience must be expected at the outstart, but there will be ample after compensation to the Trade in having a plan progressive in its character, that will enable accommodation to be provided as the demand, from time to time, may require, and, as completed, work into one harmonious whole. It is cause for congratulation that, although there has been delay in obtaining the approval of the plan, it has passed through the ordeal of so many examinations and criticisms that it is now generally acceptable to all the different interests concerned.

Legislation will be required for the financial arrangements for carrying on the work. This it is hoped will be obtained at the next session of Parliament. Meantime, the borrowing powers of the Board will enable the commencement to be made without any additional charges being imposed on the Trade.

The present bonded indebtedness of the Trust is \$2,295,000, on which the yearly interest is \$118,005.

The very rapid expansion of the export of Live Stock has led to serious complaints of the want of accommodation for that branch of trade. It must be admitted that at the present time, with the restricted space on the wharves, all the facilities the Board desires to give cannot be provided. The laying of a third track has been suggested as a remedy. At certain points that would be an impossibility without obstructing the general traffic. On the whole length of the wharves occupied by the Regular Lines it would curtail the space required for general cargo to such an extent as to be very objectionable. Even if a third track were possibly practicable it would be only a partial relief to the blockade that has arisen from the

sudden development of this trade, which is of so much importance to the Dominion. When the Plan of Harbour Improvement, now approved by the Government, is carried into effect, the facilities for the transfer of traffic of all kinds will be such that nothing to be desired will be wanting. It will then, without doubt, be generally admitted that this is the port at which this, one of the most important trades of the Dominion, can be best developed. In the meantime it is clear, from the evidence taken at the recent investigation held here, that the difficulties and hindrances connected with the shipment of live stock from this harbour could be materially lessened by arrangements between the ships, railways and the cattle exporters. Anything that this Board can do to facilitate this, or any other, branch of trade will always be done promptly.

The increase in the coal trade to the harbour is very noticeable. That interest has made a demand for the revision of the tariff of wharfage, so as to give a reduction in the charges on coal, which is now on the 7½c. per ton list. The grain trade has also intimated its intention of applying for a reduction of wharfage dues, whose trade is also on the 7½c. list.

It must be borne in mind that within the last ten years a readjustment of the tariff and a reduction, on the average, of over 25 per cent. was made, and in 1888 the tonnage dues on ships were entirely taken off, so that they are now free from all harbour charges.

The wharfage charges are moderate when compared with those of any similarly situated Trust, and in view of the prospective new works, however desirous the Board may be to reduce the tariff, the present does not appear to be a judicious time to agitate for any changes. If one branch of trade is granted a reduction, all other branches are equally entitled to it.

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The by-laws regulating the removal of goods from the wharves are old, and, as the condition of things and the course of trade have materially changed, they are not adequate to meet existing requirements. Complaints are freely made of merchandise remaining too long on the wharves, and on the other hand consignees say that with ships unloading night and day, discharging their cargo indiscriminately, it is not possible to remove their goods within the time prescribed by the by-law. The consequence is that the Harbour Master practically exercises a discretionary power without any authority, and this leads to charges of partiality. The Board has frequently had this matter under consideration. The exact way to deal with this question is a very delicate one, without rendering injustice to any interest.

It has been suggested that the fairest way would be to charge extra wharfage on goods remaining on the wharves after the ship has been discharged. This view of the case has been presented forcibly to the Board, but as yet no fixed action has been taken.

During the last three years much has been done by the Dominion Government to relieve the Shipping Interest engaged in the trade of this port. Hospital dues are still collected, but the negotiations now going on lead to the belief that arrangements will be made by which ships will take care of their sick mariners and the hospital dues be removed.

Since the disbandment of the Water Police Force here the police dues on vessels coming to Montreal have been abolished, and the Shipping Trade have nothing to complain of in that respect.

The fact remains, however, that police dues are still collected on ships arriving in Quebec, and this works a serious injury to all inland vessels, trading not only to and from Montreal, but to all clearing from any port in

the Province of Quebec. Such vessels, when going into ports of the United States, are subject to a tax of 3 cents per ton, per voyage, not exceeding 15 cents per ton per annum, so long as the tax now imposed on the St. Lawrence route for police and hospital dues remains in force.

In the interest of the inland navigation of this Province it is hoped that means will be found to remove this apparent anomaly.

In addition to the usual reports of the Officers of the Board, the Order in Council and Mr. Perley's interesting and valuable report, accompanied by a diagram shewing the main features of Plan No. 6A which will make the report complete, have been ordered to be printed and will be found in the Annual Pamphlet issued by the Board.

[COPY.]

SIR,

I am directed to inform you, herewith, that the report passed on the adoption of the Commission's recommendation for the

I also enclose herewith the subject.

ALEXANDER

Harbour

DEPARTMENT OF PUBLIC WORKS.
CANADA.

[COPY.]

OTTAWA, 28th January, 1891.

SIR,

I am directed by the Minister of Public Works to send you, herewith enclosed, a copy of an Order in Council passed on the 17th instant, approving the report of the Chief Engineer of this Department recommending the adoption of the plan No. 6, presented by the Harbour Commissioners of Montreal, for increasing the accommodation for vessels and traffic in the Harbour at that place.

I also enclose a copy of the Chief Engineer's Report on the subject.

I have the honour to be,

Sir,

Your obedient servant,

E. F. E. ROY,

Secretary.

ALEXANDER ROBERTSON, Esq.,

Secretary,

Harbour Commissioners, Montreal.

[COPY.]

Certified copy of a Report of a Committee of the Honourable the Privy Council, approved by His Excellency the Governor General in Council, on the 17th January, 1891.

On a Memorandum dated 26th November, 1890, from the Minister of Public Works, submitting the annexed report, made by his Chief Engineer, advising the adoption of a plan presented by the Harbour Commissioners of Montreal, for increasing the accommodation for vessels and traffic in the Harbour of Montreal.

The Minister recommends that such plan be approved as suggested by the Chief Engineer.

The Minister further recommends that the Order in Council of the 1st July last, recommending further enquiry in the matter, be cancelled.

The Committee, concurring in the above recommendations, submit the same for your Excellency's approval.

(Signed,) JOHN J. MCGEE,

Clerk, Privy Council.

To the Honourable the Minister of Public Works.

DEPART

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A. GOBEIL,
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DEPARTMENT OF PUBLIC WORKS OF CANADA,

CHIEF ENGINEER'S OFFICE,

OTTAWA, 17th November, 1890.

SIR,—

In obedience to the request contained in your letter of the 25th ult., No. 66,091, I have duly considered the application of the Harbour Commissioners of Montreal to have approved a plan for increasing the accommodation for vessels and traffic in the harbour of Montreal, and protecting the city front from floods, and I have to advise that the plan so presented be approved by the Honourable the Minister.

The reasons which have led me to advise this course will be found in the memorandum attached hereto.

In the memorandum will also be found descriptions of schemes for the improvement of the harbour of Montreal, and for preventing the inundations of the lower part of the city, which have, from time to time, been submitted to the Department.

I am, Sir,

Your obedient servant,

(Signed) HENRY F. PERLEY,

Chief Engineer.

A. GOBEIL, Esq.,

Secretary, Department Public Works.

MEMORANDUM.

For many years the question of increasing the accommodation for ocean vessels in the port of Montreal, and uniting with it the great railway systems which now centre in the city, has been prominently before the public, and more especially before the merchants and citizens of Montreal, who now see that immediate steps must be taken to accommodate the yearly increasing amount of shipping which frequents the port, the present wharf room not being sufficient to accommodate the number and size of the vessels now engaged in sea-going traffic. This traffic is not that of the port of Montreal as a port *per se*, but of the principal port of the Dominion, to and from which, during the season of navigation, the imports and exports of the Dominion to the westward of Montreal are made. If the business of the port were confined to that of Montreal alone, then the present amount of wharfing would be ample ; but as the bulk of the exports and imports of the Dominion has to be handled at Montreal the present wharfage is not, either as regards the accommodation or depth of water afforded, sufficient, and the duty and expense of increasing this wharfage, not only for present needs, but for those of a reasonably near future, have fallen upon the Harbour Commissioners of Montreal, who have to recoup their expenditure for construction and maintenance out of the revenue derived from the increased wharfage facilities to be supplied.

In years past public attention was directed to the question of increased harbour accommodation, and plans were prepared and submitted. A scheme for docks at Hochelaga, with a continuation thereto of the Lachine Canal along the city front, was proposed, and objected to, on the grounds that it would prejudice the interests of the city as then located. Another scheme for extensive wharfing extending from Point St. Charles and the har-

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bour front below the entrance to the Lachine Canal was objected to on the grounds of excessive cost. Then followed the "Shearer Scheme," so-called, which, whilst it professed to increase the harbour facilities, more immediately partook of a scheme to furnish water-power for manufacturing purposes, and it in turn was set aside by reason of its great interference with the free flow of the St. Lawrence. In 1887 a plan for wharves at Hochelaga, prepared by the Harbour Commissioners, was approved, and their construction proceeded with. To-day they are used almost entirely for the landing of coal for the sugar refinery, the cotton mills, the Canadian Pacific Railway, and the many industries which have sprung up in the neighbourhood. In 1888 the Harbour Commissioners prepared a plan for wharves and a guard pier at the upper end of the harbour, which, by order of the Department, was submitted to the Flood Commissioners, who had just submitted their report on the "Floods at Montreal—the Cause, Prevention, etc.," and after due consideration the plan was approved by a majority of the Commissioners, the exception being the representative of the City of Montreal, who did not join in the report because the question as submitted by the Harbour Commissioners did not embrace the consideration of a permanent dyke, which he held must be erected in connection with the work proposed (see copies of letters attached); but it must be stated that, after the submission of an amended plan covering flood protection works, to which reference is made hereafter, Mr. St. George, the City's representative, did, on the 24th January, 1890, state that he concurred in the report presented by his fellow Commissioners. (See copy of letter attached.)

It may be well to state here, *par parenthèse*, that in the spring of 1886 the lower portions of Montreal were flooded, the St. Lawrence having risen to a height of 5 ft.

10 ins. above the revetment wall, and this led to the construction of a dyke or levee from the city limits to the tail-race bank of the city water-works. In the spring of 1887 a second inundation to a height of 4 ft. 7½ ins. above the revetment wall took place, the result of which was the construction by the City authorities of a dyke of a temporary character along Commissioners street and Common street, pending the construction of permanent works in connection with those proposed for increasing the accommodation for vessels in the harbour, and it was because the plan submitted in 1888 did not contain any works for the protection of Montreal from flooding that the City's representative on the Flood Commission refused to sign the report of May, 1888, before alluded to.

This plan was not acted upon by the Harbour Commissioners, and the matter remained until January, 1889, when the Chief Engineer of the Harbour Commissioners, and the Surveyor of the City of Montreal, submitted plans, etc., prepared by them in compliance with a resolution passed at a joint meeting of committees appointed by the City Council of Montreal and the Harbour Commissioners, held in June, 1888. This resolution was to the effect that it was expedient in the interest of the city and harbour of Montreal, there should be joint action in preparing plans covering the following improvements:—

- (1.) An elevation of the front of the City, securing the City from inundation.
- (2.) A sufficiently commodious street, by enlarging the present Commissioners street.
- (3.) A plan of harbour improvements, specific in detail, so far as it may connect with the City improvements above referred to.
- (4.) The appointment of the City and Harbour Engineers to furnish plans providing for above improvements, make

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estimates of probable cost, and, so far as practicable, the proportion of total cost that should be assumed by the City and harbour respectively.

In their report the Engineers submitted six schemes prepared to cover one or more of the following propositions :—

(1.) That the central portion of the city is unprovided with permanent works for flood protection.

(2.) That the raising of the whole width of Commissioners and Common streets above flood level, or the construction of a strong dyke or wall along the outer side, would be an efficient protection against floods.

(3.) That Commissioners street may be widened by encroaching on the harbour property on one side, or private property on the other, as may best suit public interest, and that the widening of Common street is implied in the widening of Commissioners street.

(4.) That the main feature of the plan for harbour improvements submitted by the Harbour Commissioners in 1888, and approved by the Flood Commission, could be fitted into a general scheme.

(5.) That only those features of flood protection, street widening, and harbour improvements, which affect one another, should be dealt with at once, leaving the question of space for surface and elevated railway tracks, freight sheds, etc., to be treated at a future date.

These schemes are explained in the report submitted to the City and the Harbour Commissioners ; and by a letter from the Harbour Commissioners, dated 10th January, 1890, copy of which is attached, it appears that Scheme 6 had been adopted.

This scheme contemplates the widening of Commissioners and Common streets east of St. Peter street to 75 feet minimum width by encroaching on the harbour pro-

perty, and to the same width west of McGill street by the acquisition of private property; and, owing to the restricted breadth of wharf space on one side, the present width would be retained between McGill and St. Peter streets, thus leaving Commissioners street 75 feet wide at its narrowest point, but with an average breadth of nearly 90 feet; and the Engineers remark that the benefit to be had from a greater width cannot be considered worth the cost of obtaining it.

For the protection of the city from inundation a parapet wall is to be constructed, through which for access to the wharves, openings would be left, which, between the closing of navigation in one year and the opening the ensuing year, would be closed by iron gates.

To increase the accommodation for vessels and freight the Harbour Commissioners propose the construction of four wharves in the position shown in *red* on the plan herewith, their lengths varying from 900 to 1,500 feet, with a breadth of 230 feet, or a total increase of 10,000 lineal feet of frontage over the present wharves, the water spaces or basins between the wharves being 300 feet in width. These wharves to be built to the height of Commissioners street thus doing away with all "ramps," except one set at the lower end for access to the existing wharves beyond the limits of the scheme, thus giving complete freedom to cartage and tramway traffic between the city and the wharves, and saving the room taken up by "ramps," and the cost of their construction and maintenance. For the protection of the wharves, a "Guard Pier," extending from the western abutment of the Victoria Bridge down stream a distance of 7,000 feet, will have to be constructed; and the Engineers remark, in connection therewith, that in all the schemes proposed they have included the cost of such structure, claiming that it is an essential feature in all the flood protection

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works; that its effects will be to guard the city front from the violent shoving of the river ice, leaving the inner works to resist only still water and a smooth sheet of ice; that without such a guard pier the flood protection works on Commissioners street would have to be made strong enough to do the whole of the work; and that with its construction the city would have two lines of protection instead of one.

By the construction of the guard pier an area of some 250 acres in extent of comparatively still water would be enclosed, which, by dredging, the materials being utilized in the construction of wharves, etc., could be brought to a uniform depth to accommodate all vessels which can pass through the ship-channel from Quebec.

This question of high level wharves and the convenience they would afford to vessels has been discussed with some of those interested in shipping, and the Engineers consider that the height within reasonable limits is of small importance, as no fixed height can suit all conditions, as the water in the harbour fluctuates 10 feet during the summer, and a ship varies in draught as she is either loaded or light; but by the application of modern appliances all the varying conditions can be met and overcome. The cost of building such high wharves will add materially to the gross outlay, and no doubt their maintenance in the future may be high, but the advantages they offer in widening the streets referred to, in providing readier access by rail and cart, in permitting a continuous through railway connection with all the wharves in the harbour, and in contributing to safety in the matter of flood protection, in preventing the ice from touching the parapet and gates, must be taken into consideration. It is also claimed that permanent freight sheds could be built on these wharves, which, standing at a level above which the heavy ice forms, would be less

liable to damage from it, as their floors would not be above extreme flood level, and would only be covered with water when an extra flooding of the St. Lawrence takes place, or when it rises high enough to flow over the present revetment wall.

The cost of this scheme is estimated by the Engineers as follows :—

For works.....	\$2,739,372 00
For lands and buildings.....	88,522 00
	<hr/>
Total.....	\$2,827,894 00
Of which the City's portion would be.....	708,428 00
	<hr/>
Leaving to be found by the Harbour Commissioners.....	\$2,119,466 00

With reference to this last amount, it must be stated that it contains the whole cost of the "Guard Pier," but as that work saves to the City an expenditure on other protection works, it is fair to assume that in the event of its construction the City will contribute thereto.

In March, 1889, the Board of Trade of Montreal called a public meeting, at which various plans were submitted, and a committee representative of all the different interests—shipping, railways, etc.—was appointed, which in May following submitted their report to the effect that plan No. 6, prepared by Mr. J. Kennedy, the Harbour Engineer, and Mr. P. W. St. George, the City Surveyor, in a general way best accomplishes the ends to be obtained, viz., the improvement of the harbour and protection against floods; and with respect to the "Guard Pier," they state that it "will not interfere in any way with the ordinary current of the river, or augment floods in other directions, or increase the force or speed of the current in the river. It is the opinion of the committee that it would serve the following ends: It would protect the new projected wharves and piers and the entrance to

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the Lachine Canal against ice-shoves in the winter, though the open space left at its lower end may still be too wide to ensure entire protection at and about the entrance; it would create a still-water basin around the new wharves at the entrance to the canal and at Windmill Point, which would immensely increase the facility for moving craft in the neighbourhood, and the entrance and despatch of craft and tows navigating the canal, and generally be an advantage in the meeting of inland and ocean craft, and it would afford another valuable railway connection with ocean vessels."

This scheme has been objected to on the grounds that the "Guard Pier" would cause floods at and opposite Montreal to occur more frequently than at present, but no reasons have been given in support of such prohibition. As previously stated, this scheme was considered and approved by the members of the Flood Commission, who, fresh from the results of an inquiry and investigation extending over two years, were well able to judge and decide on the question of the "Guard Pier" and its effects on the river at and opposite Montreal, and who, on the 11th May, 1888, in reply to a letter from the Department, dated 20th April, 1888, stated that they had carefully considered the question and were of the opinion that the proposed works would not be detrimental, and that they would not have any appreciable effect in either causing or increasing floods at and opposite Montreal.

The flooding of Montreal and of lands on the opposite side of the river is not due to the existence of obstructions either of a natural or artificial character in the harbour of Montreal, but is due to causes which are exceptional in their nature and effects, causes which can neither be foreseen or guarded against.

The St. Lawrence is a peculiar river, peculiar in the fact that it flows to the north, and that its mouth closes

earlier in winter, and opens later in the spring than those of its head or upper portion. It is a river not subject to floods like many of the larger rivers on this continent, which are due to the flow of an excessive quantity of water; but its floods, which extend over a comparatively small portion of its length, are due to the action of the ice, which, blocking the channels, creates a rise of water before the river can force open a larger area of waterway, and thus assume its flow through its natural channel. To account for the flooding of Montreal and vicinity, the cause has to be looked for below the city, and the cause is the packing of ice brought for many miles above the city.

In the latter part of November the formation of ice commences on the shores of the mainland and islands, and on the shoals which are more or less numerous and extensive as the river varies in height. This "bordage" ice pushes outward as the water becomes colder and thickens, unless a wind breaks it up and sends it down stream. If the "bordage" is strong enough to withstand the effect of moderate waves it is thickened and strengthened, and as it extends from the shore and encroaches on the main channel, light floating ice is drawn under it, is arrested and finally becomes part of the superincumbent ice. But under the action of heavy winds the bordage is broken up into cakes, notably that which has formed in Lakes St. Francis and St. Louis, and these masses are sent by the current and wind over the rapids between Coteau and Beauharnois, through Lake St. Louis, over the Lachine Rapids, past Montreal, and down the river until arrested in the open channel through Lake St. Peter, where the effect of the tide is first felt, and with this stoppage the cakes are frozen together and a "bridge" is formed. At the first formation of the bridge the floating cakes are comparatively thin and often

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tilted on edge by the force of the current, projecting vertically and irregularly above and below the surface of the water; and as they flow against the bridge they are driven under and soon arrested and held by the ragged outlines of the bridge, and all submerged interstices are filled with a "frazil" which, on meeting with the first obstruction, is drawn under by the current, but immediately rises to the under side of the ice, where it is retained; and the presence of "frazil" is a very large factor in forming an obstruction in the channel. The downward flow of ice varies with the supply, which in turn varies with the weather, and the upward march of the ice-bridge is dependent upon this flow and the strength of the current induced by the presence of the ice-bridge itself. With continued cold weather and high winds producing an abundant supply of floating ice, the upward march between Lake St. Peter and the foot of St. Mary's Current at Montreal, a distance of 45 miles, will average 4 miles per day, and as the packing becomes more severe a rise of water takes place, increasing in height as the river is ascended. For example, on the 4th December, 1886, the ice-bridge took at Nicolet, at the foot of Lake St. Peter; it reached the head of the lake on the 5th, Sorel on the 6th, Verchères on the 9th, where, owing to a five days' thaw its progress was arrested. On the 16th it reached Varennes, on the 18th it had ascended to Longue Pointe, where, owing to moderate weather, it remained stationary until the 24th. Hochelaga was not reached until the 29th, Laprairie village on the 30th, and the foot of the Lachine Rapids on the 31st.

The rise of water which accompanied the closing of the

river at the date mentioned at the points stated, was as follows :—

	Fr.	Ins.	
Sorel	4	2	above low water
Verchères	10	2	do
Varennés	11	2	do
Longue Pointe	11	5	do
Hochelaga	15	9	do
Lock sill, Montreal	16	11	do
Laprairie	9	9	do

Between Hochelaga and Sorel there are not any rapids, and the river has a nearly uniform fall of 1.06 inches per mile, with an average channel velocity of $2\frac{1}{4}$ miles per hour in summer. Between the Victoria Bridge and the foot of the Current St. Mary the summer fall is 9 feet, with a velocity of current varying from 4 to 8 miles per hour. These are summer rates, but in winter the character of the river changes, and instead of being an open water-way, it, after its surface is covered with ice, becomes to a certain extent a huge tube, and it follows that a rise in the surface of the river must take place. With reference to this, the following is quoted from a report on the "Shearer Scheme" (so-called) by the late Thos. Guerin, C.E.: "It is not an abnormal state of things that the River St. Lawrence should rise when frozen across. There never has been a river, nor stream, nor rivulet, that did not rise above its previous level on being frozen across. Hydraulic science not only demonstrates that such a rise must take place, but it enables us to ascertain the height to which the rise will ascend. Here are the facts:—

"It is a well known principle in hydraulics that in the same stream the velocity varies inversely as the square root of the wetted perimeter; and * * * * the wetted perimeter of St. Mary's Current and the south channel are for all practical purposes equal to the width

of the stream. The river is frozen. In some cases will be the velocity of the previous year.

This fact is when the which it is the evidence late Mr. Ha tion of the found that reduced to that if the v half, the qu the area of depth of the the river mu does not do, main consta presence of the spring Montreal, it through the through an at the head and it rises phenomena

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of the stream. Hence, it follows that the moment the river is frozen across the wetted perimeter is twice what it was in open water, and the ratios of velocities in both cases will be as $1 : \sqrt{\frac{1}{2}}$, or as $1 : .70$, or, in other words, the velocity after being frozen across will be $\frac{7}{10}$ of the previous velocity."

This factor $\frac{7}{10}$ Mr. Guerin contended was only correct when the underside of the ice covering was smooth, which it is known not to be, and he reduced it to $\frac{5}{10}$ on the evidence furnished by a winter survey made by the late Mr. Harrington of the Lachine Canal office, of a portion of the river in the vicinity of Moffatt's Island, who found that the summer velocity of 7 miles per hour was reduced to $3\frac{1}{2}$ miles in winter; and he, Mr. Guerin, stated that if the velocity of the current was reduced by one-half, the quantity of water passing per unit of time, and the area of section remaining constant, then the mean depth of the river must be doubled, or, in other words, the river must rise to twice its height. This, of course, it does not do, for the flow and area of section do not remain constant; but the fact nevertheless remains that the presence of the ice-bridge restricts the flow, and when in the spring a larger volume of water is brought past Montreal, it cannot pass as freely under the ice, or through the tube, which may be 70 miles in length, as through an open waterway, and the water is impounded at the head of the tube, which happens to be Montreal, and it rises, the height varying with the physical phenomena of the season.

The flooding, or abnormal rise of the river at Montreal, may therefore be charged to natural causes, and not to the existence of obstructions opposite the city, and it may be assumed that those obstructions, if removed, would not prevent flooding. In the report of the Flood Commission it is stated that when the ice shoves against an island, a

point of land, or a wharf, and piles to a great extent and stops, the popular idea is that here is the "obstruction" which stopped the ice, and that but for it the ice would have continued to move, and that its stopping is the cause of the flood. This belief no doubt arises from the fact that the departure of the ice is the signal that the flood is over. The force of the shove is really expended against an ice-bridge between those points and islands, or resting on shoals, and these apparent obstructions are the only places where relief is given by the shove, because all the ice which is driven by the shove above flood level is disposed of, can be counted out of the race, and the river is by so much relieved. But where the shove is against the ice-bridge, backed by an unyielding field of ice extending to Three Rivers, or some 70 miles in extent, the moving field is crumpled on the surface, rises up and piles upon the bridge, sinking it almost to the bottom—probably quite to the bottom at some places—and suddenly forming more or less of a dam against which the water rises rapidly and floods the region above. This is an obstruction which cannot be removed, but may be diminished, by diminishing the quantity of ice, as before stated.

The removal of islands and shoals would only have the effect of causing the additional room made in the river to be filled with ice, and of causing more ice to stop near the city.

The question of areas of water-ways need not be discussed here. Free from ice, there are, opposite Montreal, water-ways ample to pass all the water which can possibly be brought to them. In the winter the question of ample water-ways has to be considered at many points in the St. Lawrence below Montreal, for it is at such points a diminution by ice and frazil takes place, and if Montreal and vicinity are to be prevented from being flooded in the future, then means must be adopted (1) to hold back

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all masses and cakes of ice formed during the early part of the winter in the river between Lachine and Cornwall, or (2) to keep open a channel through the ice between Montreal and Three Rivers, until the flow of ice from above Montreal had ceased.

To return to the immediate subject of this memorandum, the plan submitted by the Civic authorities and Harbour Commissioners of Montreal, for increased wharfage accommodation in the harbour, and protection works against flooding of a portion of the city, the undersigned has to state that as a member of the Flood Commission he carefully considered the plan submitted to that body, and with his fellow members approved thereof; and, having as the Chief Engineer of the Department again considered the matter, is still of the opinion that the works proposed will neither cause flooding at Montreal or its vicinity, nor add to the severity of such flooding when it occurs, as it has been proved that floods are due to physical causes, which might be modified in their action but never entirely removed.

The Harbour Commissioners of Montreal are desirous — nay, it is imperative upon them—to provide for the increasing traffic of the port, to commence at once the preparations for construction of the wharves in question, but they claim that they cannot do so unless they are permitted to proceed with the construction of the "Guard Pier," as that work will not only add to the safety and security of the wharves, etc., they propose to build, but to the security of the city against the effects of flooding, a matter they have considered and arranged with the Civic authorities. It is claimed that the plan submitted will give the wharfage accommodation, the enlargement of streets, increased facilities for cartage, uninterrupted railway communication along the whole length of the harbour front, and the means for protecting the low lying

portion of the city from flooding, at a much less cost than any of the other schemes considered by the joint committee, and though not possessing some of the benefits furnished by more costly schemes, it has been adopted and submitted for approval.

The traffic of the greater portion of the Dominion is through Montreal, and as it is an increasing traffic, the means for its handling and transfer at that port must be provided. To-day the facilities for doing so are inadequate, and the Harbour Commissioners, in view of their great responsibilities, have had a plan prepared for increasing the capacity of the harbour, a plan which has been before the public for many months, and not publicly objected to, though it, or the demand for an increase of harbour accommodation, has given rise to plans and propositions from outside sources, which vary according to the ideas of those who designed them; but of all those which the undersigned has had laid before him, none of them compare with the plan submitted by the Harbour Commissioners, as regards accommodation for vessels, prevention of flooding Montreal, and ultimate cost.

For the sake of comparison, a short description of these plans, etc., may not be out of place, and the positions the works proposed by the several designers occupy in the harbour are shown in different colours on the plan attached hereto.

The scheme submitted by Mr. F. W. Henshaw is the construction of a "wet basin" of about 24 acres in area, between Wellington street, the Lachine Canal basins, Common street and McGill street, its water level being the same as that of the Lachine Canal, its depth, no doubt, sufficient to float the largest vessel plying or likely to ply on the St. Lawrence, the entrance for which class of vessel is to be through a lock from the harbour at a point immediately outside of the entrance to the Canal; whilst

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vessels of draught sufficient to pass through the canal basins can enter directly from the basins. The available side wharfage would be about 4,700 lineal feet, or about 65 lineal yards per acre of water. No estimate of cost that the undersigned is aware of is given, but the amount for land damages and the lift lock would, no doubt, be large. The works in connection with this basin would not afford any protection against the flooding of Montreal.

Owing to the peculiarity of the "sketch" prepared by Mr. E. W. Plunkett it is not possible with absolute correctness to transfer it to the plan herewith, but enough is shown to permit a comparison with the other schemes shown thereon. From the memorandum accompanying the sketch the following has been gathered: The project is made up of uniform parts, each complete in itself, consisting of one pier and basin, with necessary railway connection and elevator service, which can be built from time to time as the requirements of trade demand. The site is the upper portion of the harbour where there is a wide expanse of river, and a bottom "dredgable" to required extent at a reasonable expense, and the area so deepened is to be fully protected from the shoving of ice by a wall or dam of sufficient strength and height. A number of piers are to extend at intervals along the harbour front, from the foot of the canal to opposite the lower end of the Bonsecours Market. From a central pier, about 3,000 feet in length, and built in the river at a distance of about 2,000 feet from the present line of Commissioners street, certain other piers are projected, extending from either side; and beyond this again is a large construction, jutting out into the river about 3,000 feet, and extending the same distance down stream, carrying on its outer edge a protection wall or dam to resist the shoving of the ice.

The piers and ice dam are to be built of concrete, with two floors, one for the summer level of the river, the other standing 2 feet above the highest known flood, and both floors can be worked during the season of navigation. Warehouses and elevators of concrete are to be built, rail tracks laid, roadways for cartage at each level provided, and all modern appliances for the moving of cars, hauling of freight, loading and unloading vessels, dry-docks for repairs, etc., are to be constructed and furnished, the total cost being placed at \$9,588,000.

The memorandum accompanying the plans obtained from Mons. R. Le Brun, of Paris, is divided into two parts—"Inundations" and "Montreal Harbour"—and as the first has a bearing on and connection with the latter, it is necessary to refer thereto in as cursory a manner as the subject will permit, but without any attempt at criticism. Mr. Le Brun commences his memo. by repeating what has been previously stated by the undersigned herein, that the inundations at Montreal are caused by the obstructing of the river channel by ice, and the water, no longer finding its natural channel, rises and floods the adjacent banks. He states that this channel when unobstructed is sufficient to carry off the waters of the river, even when they are at the highest level, and he would solve the problem of inundations in one of two ways, (1) either by breaking up the ice masses into fragments of the smallest possible volume, or (2) "by giving the river the most rational conformation;" but in the body of the memo. the necessity of holding back the ice formed above Lachine and to regulate its flow is discussed, and it is proposed for that purpose to make use of the Canadian Pacific Railway bridge below Lachine, and the Victoria Bridge at Montreal in connection with movable dams; and that further dams might be built at Lachine and Melocheville, at the head of Lake St. Louis.

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This retention of ice above Montreal was advised by the Flood Commission in 1887.

For the breaking of ice into small masses, Mr. Le Brun suggests the use of dynamite, ice-saws or ice-breaking steamboats to break up in advance the ice-bridges, or at least to reduce their thickness and adhesive power by dividing them into small fragments, as in this way the passage of the early ice-flows would be facilitated and the dangers of the ice "shove" would be diminished.

Dynamite was tried in March, 1887, by the Flood Commissioners, and the results in breaking up the ice were good; but the effects obtained were not of any service, as there was solid ice for 70 miles or more below the place operated upon, and one night's frost solidified the whole of the area broken up by the explosions. Again, the Flood Commissioners, in October, 1886, considered the question of keeping open the channel between Three Rivers and Sorel for a period of time long enough to remove a great portion of the floating ice arrested between Montreal and Sorel, and they stated that if such could be done the river, with its dangerous burden of ice, would be kept within its banks, and both shores of the St. Lawrence between Three Rivers and the Lachine Rapids would be relieved of the risk due to inundations caused by ice; but they were aware that conditions of weather may occur which, with the appliances available, may render the attempt abortive, but they believed that every day in which the ice from above Sorel can be kept running past Three Rivers, such passage would tend to alleviate the risk of ice floods.

It is very satisfactory to know that the suggestions made by the Flood Commission have received approval from an independent investigator.

For the rectification of the river, the means proposed

by Mr. Le Brun are simply heroic, and their ultimate cost enormous.

Commencing in the river above Montreal, Mr. Le Brun proposes to erect a dam from the head of Nuns' Island closing the channel between that island and the mainland. From the foot of the island a second dam to be built to meet the fourth pier from the Montreal end of the Victoria Bridge, and from thence down stream to a point about half a mile below the Bonsecours Market, where an opening would be left to admit vessels into a basin 6,000 feet in length, relative to which reference will be made further on. This line of rectification, which is the sweep of a great circle, is carried on as far as the mouth of the Ruisseau Migeon. Parallel with the new shore line thus laid down and distant 1,950 feet therefrom a second dam is proposed, extending from a point opposite pier No. 10, Victoria Bridge, downwards in front of St. Helen's Island, through Ile Ronde, a portion of which is to be removed, and terminating at a point 1,000 feet below the island, or below the foot of St. Mary's Current. A third dam to extend from the point off pier No. 10 to the most southern point of St. Helen's Island, the shore of which is to be utilized until it trends away through the channel separating Ile Ronde, which (the channel) is also to be closed. Moffatt's Island and an adjacent islet are to be enclosed by dams or retaining walls, and the vacant space filled with dredged materials. The old railway wharf at Moffatt's Island to be removed and replaced by a "movable dam," which is to remain closed during the summer, and be opened during the winter to permit the passage of ice, which would pass through the south or St. Lambert's channel. Mr. Le Brun states that the first measure necessary will be to remove the present obstruction between St. Lambert's shore and Moffatt's Island, and all the rocks, etc., that obstruct the river bed in the chan-

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nel between St. Helen's Island and the St. Lambert's shore to at least $6\frac{1}{2}$ feet below low water level. The channel between the dams built opposite Montreal to be deepened to a depth sufficient to admit the largest vessels, using the materials raised to make ground inside of the several dykes or dams.

Below the city Mr. Le Brun deems it essential to close all the channels between the Boucherville Islands to maintain the parallelism of the main channel, thus doing away with all obstacles to the free flow of the river, and maintaining the current with the least possible expense.

Opposite Bout de l'Isle, dams connecting a series of small islands must be built to deflect the current caused by the outflow of the north branch of the Ottawa at that point, to a course more nearly parallel with that of the St. Lawrence.

Mr. Le Brun further states that below Pointe aux Trembles important works for the rectification of the channel would be necessary, but their position is not shown on the plan submitted by him.

Returning now to the harbour of Montreal, Mr. Le Brun characterizes the present wharves and the accommodation they afford, as a "hap-hazard arrangement," and to substitute for "this defective system a harbour constructed and equipped on rational principles" would "lead to an augmentation of Montreal's traffic, etc." He states that, in his judgment, he has indicated the works necessary to preserve the city from inundations, and believes that such works are admirably calculated to create a harbour possessing all the desiderata of modern commercial life, as they would turn to the best advantage a vast space into a vast basin, having a communication with the St. Lawrence at one end and the Lachine Canal at the other; that ample accommodation would be given to the railways centering in Montreal, and that spacious permanent sheds,

sheltered from the ice and provided with all the modern appliances, could be erected, etc.

The basin proposed by Mr. Le Brun would have an area of about 108 acres, and a frontage of 6,250 feet on the city side, and 5,250 feet on the dyke or dam side, making a total length of 11,500 lineal feet of wharfage, the width being somewhat irregular, but averaging, say, 700 feet. At the upper end of the basin, three dry docks, respectively, 350, 500 and 650 feet in length, are proposed. The whole of the existing wharves are to disappear, and their sites are to be occupied by freight sheds, railway tracks, etc. The areas enclosed between the south wall of the proposed basin and the river dyke on the one side, and the north wall and the city revetment wall on the other side, Mr. Le Brun proposes to fill with materials dredged from the river and basin—and, indeed, to fill all spaces or areas, which may be enclosed by the works projected by him.

As far as practicable, the position of the works proposed on "Plan No. 2," submitted by Mr. A. L. Hogg, C. E., have been laid down on the plan herewith.

In the circular accompanying this plan Mr. Hogg states that works proposed by him are designed to overcome at once the periodical flooding of the city front and wharves, to permit permanent store-houses being built on the wharves, and to provide the much-needed accommodation for the proper care and shipment of live stock at the port of Montreal.

To obtain these benefits and accommodation Mr. Hogg proposes to construct a dam with a superimposed bridge across the St. Lawrence from the Point St. Charles abutment of the Victoria Bridge to Moffatt's Island, and thence to the St. Lambert shore; and he asserts that this dam will hold the ice in perfect control, and the only ill effects it can produce will be to hold the ice a longer time

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than usual, unless broken up by artificial means. The existing wharves to remain at their present level, but the rampart on Commissioners street may be removed. Further embankment will be necessary along the creek in rear of Point St. Charles ; and, if necessary, the strip of land inundated on the south shore, and a portion of Nuns' Island, are to be purchased.

For the purpose of increasing the wharf space on the city front, the basins between the Queen's Basin and Victoria Pier are to be filled, and a new wharf line out to the heads of the piers to be created. Wharfage and accommodation for stock-yards, coal, timber, etc., is to be obtained by enclosing and filling an area of some 98 acres in extent in the river below Point St. Charles, and by the construction of a pier or wharf, say 3,200 feet in length and 800 feet in width, from the extreme northern end of the first stated area, covering a further area of river bottom of 58 acres ; what is called on the plan the " Island shoal " is to be removed, and of course deep water made at and around the proposed wharf, which would have a total length of frontage of, say, 7,500 lineal feet.

Covering Moffatt's Island, the old railway wharf, and extending a distance of 600 feet into the river, Mr. Hogg further proposes the construction of a mass of wharfing of about 63 acres in extent, in the interior of which a basin of about 5 acres in area, with locks on either side, is to be constructed. Between this wharfing and the St. Lambert's shore a dam with timber slide and bridge is to be built, thus giving access for vehicles, street cars, etc., directly across the St. Lawrence. Below Moffatt's Island and enclosing the islets to the northward Mr. Hogg would, at a future date, construct wharves for the accommodation of St. Lambert and that side of the river ; and a bridge of timber might be constructed from this wharfing to St. Helen's Island, thus providing for a continuous carriage drive from Montreal.

This scheme requires the removal of Iles Ronde and Verte; that the dam and bridge, and the wharfing and locks at Moffatt's Island be built of stone; and that the inner wharves be made of timber and filled with dredged materials; but the circular issued by Mr. Hogg does not contain an estimate of the probable cost of the works proposed.

Mr. Ph. Cramer has addressed a letter to the Department "concerning the reduction of St. Mary's Current, and placing of new wharves, and about the flood." With regard to the second, Mr. Cramer states. "New wharves, instead of crossing the current, should be laid out as near as possible in line with the current. One wharf to be run up from Victoria Pier towards the so-called Island Pier, with a clear passage between the thus extended Victoria Pier and the shore and the Island Pier; for the purpose of such passage, the three small piers just above Victoria Pier should be removed, as also a part of Victoria Pier, and a swing bridge be thrown over in place of the removed part of Victoria Pier. A second wharf to be run from outside and above Victoria Pier to Mill Point. Between these two wharves should lie the general passage from and to the canal. After St. Mary's Current is reduced, a third wharf, if required, could be placed parallel to the shore, running from below Victoria Pier down, with traffic communication over swing-bridges, the latter to be removed in winter.

"Wharves laid out on a system as proposed would allow of easiest approach and afford the clearest passage for the tows, as well as for the water, and their erection would but little interfere with the present use of the harbour."

Captain Seery merely lays before the Department his plan for improving the harbour of Montreal, furnishes an estimate of probable cost, viz., \$2,760,000, but does not

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furnish any description of the works proposed by him. From the plan, however, it is gathered that Captain Seery would advance the harbour front about 100 feet beyond the present line of frontage, and would enclose or remove the whole of the existing wharves between the canal entrance and the Victoria Pier. On this new line, and distant 565 feet from the canal entrance No. 1 pier is projected, providing 1,705 feet of side wharfage. At a distance of 600 feet, No. 2 pier, with 1,980 feet of frontage, is to be built; and at a further distance of 650 feet No. 3 pier is to be constructed, with a frontage of 1,640 feet; and then the new line of frontage is to be followed for 760 feet to the Victoria Pier, thus providing a total of 7,900 lineal feet of wharfage in lieu of nearly the same amount which is available at present. The piers are to be 350 feet in width, their length ranging from 420 to 650 feet. The wharves proposed will be built at their outer faces to the same height as the existing wharves, but their centres will stand 4 feet higher. At a distance of 54 feet from the new line of frontage, and running parallel therewith, a new revetment wall of stone is to be built to a height of 4 feet above the highest floods. Through this wall openings are to be left at intervals for the passage of teams and railway tracks, and on its top is to be built a promenade 16 feet in width, which will extend from opposite the end of McGill street to opposite the end of Barrack street. Inside of the wall and nearly at the level of the promenade two railway tracks are to be carried on a roadway of iron girders and beams supported by iron columns. It would appear that these tracks are only for through traffic along the harbour front, and that the present system of tracks would be maintained for wharf connections and traffic. The space under the overhead railway tracks, 31 feet in width, to be utilized for warehouse purposes. The openings through the new wall

to be closed by gates on the approach of winter, thus providing protection from inundation of the city front. As the wharves will be unprotected against ice-shoves, and no provision being made for their cost on the estimate furnished, it is surmised that the sheds shown on the plan are to be temporary structures, removable at will.

A plan of harbour works at Montreal has been placed of record in the Department, which is assumed to have been presented by or through the *Chambre de Commerce du District de Montréal*. According to this plan it would appear that it is proposed to extend nearly to a point, and for a length of 600 feet, the wharfing out to the south side of the entrance to the Lachine Canal; and from the present face line of the harbour front to project at a very acute angle two wharves, 175 feet in width and 1,500 and 1,800 feet in length, into the river, their outer ends not extending beyond a line drawn from the outer point of the Victoria Pier to the south side of the wharfing south of the canal entrance. No description is given of these wharves, as to the mode of their construction, height above low water, etc., but from the number of sheds shown thereon it is assumed they are to be built to the level of Commissioners street; but there is not anything to prove the correctness or otherwise of such assumption. This scheme would add about 6,000 lineal feet of frontage to the existing wharfage, allowance having been made for the amount destroyed.

Respectfully submitted,

(Signed,) HENRY F. PERLEY,

Chief Engineer.

CHIEF ENGINEER'S OFFICE,

DEPARTMENT OF PUBLIC WORKS,

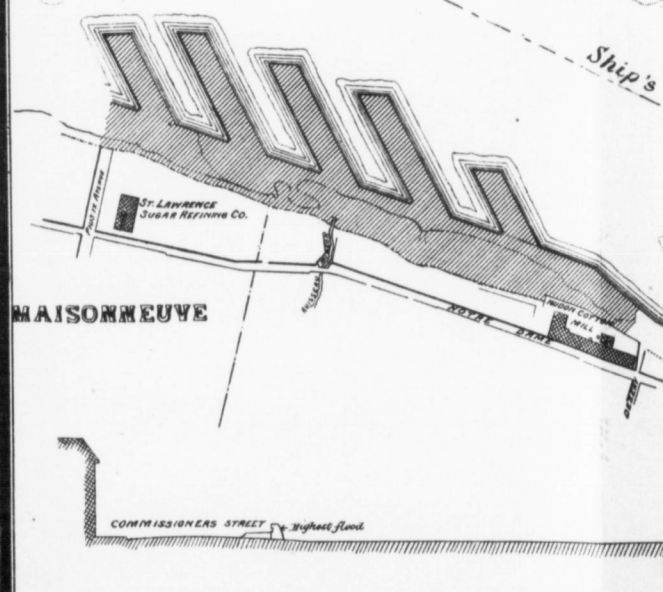
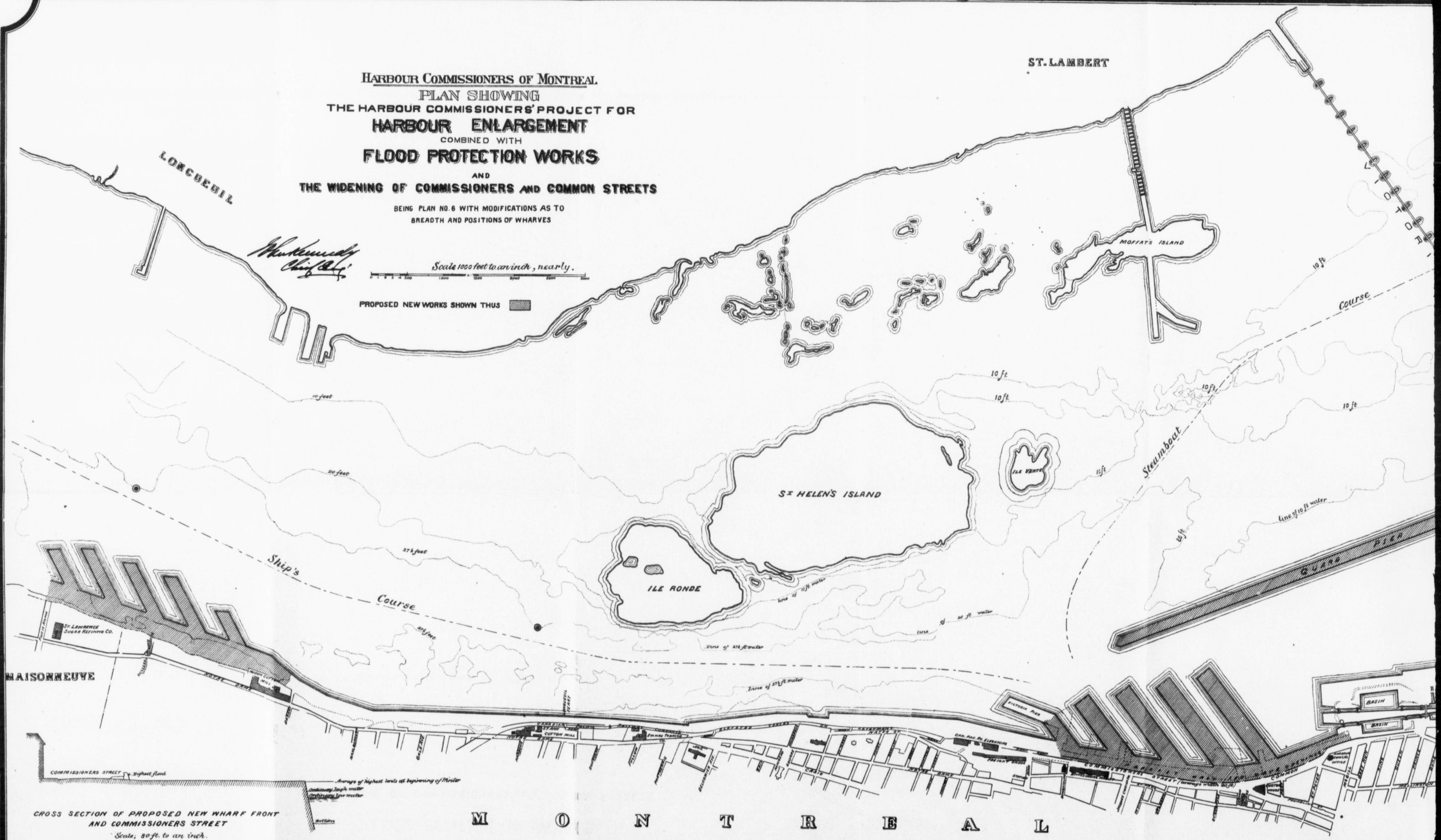
OTTAWA, 17th November, 1890.

HARBOUR COMMISSIONERS OF MONTREAL
 PLAN SHOWING
 THE HARBOUR COMMISSIONERS' PROJECT FOR
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 COMBINED WITH
FLOOD PROTECTION WORKS
 AND
THE WIDENING OF COMMISSIONERS AND COMMON STREETS
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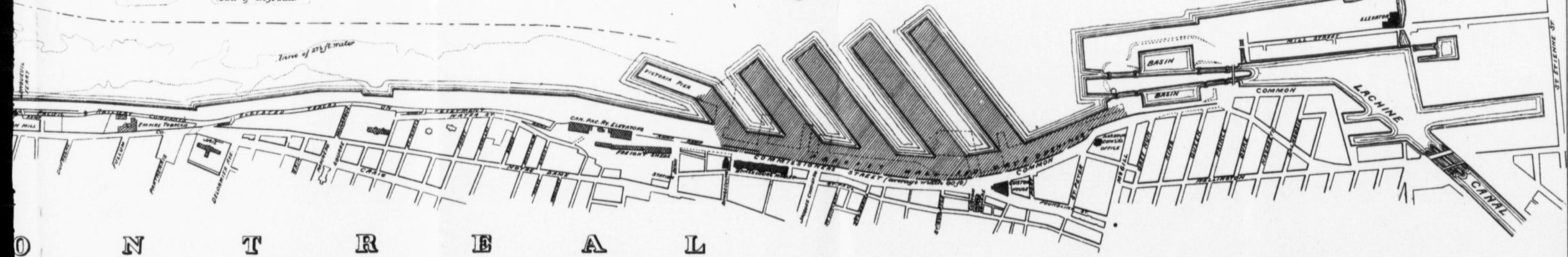
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DEPARTMENT OF PUBLIC WORKS,

OTTAWA, 20th April, 1888.

SIR,—The Harbour Commissioners of Montreal have laid before the Honourable the Minister of Public Works plans of proposed enlargement of the harbour of that place, and have asked that an opinion be obtained from the Flood Commission as to whether such enlargement would be detrimental in causing or increasing the floods which take place at and opposite Montreal.

An early meeting of the Flood Commission is therefore desirable, at which the Chief Engineer of this Department will present the plans and papers to be considered.

I have the honour to be, Sir,

Your obedient servant,

A. GOBEIL.

T. C. KEEFER, ESQ., C.E.,

Chairman Montreal Flood Commission,

Ottawa.

— — — — —
MONTREAL FLOOD COMMISSION,

MONTREAL, 11th May, 1888.

SIR,—We beg to acknowledge the receipt of your letter of 20th ult., asking the opinion of the Montreal Flood Commission as to whether the proposed enlargement of the Montreal harbour, according to the plans laid before the Honourable the Minister of Public Works by the Harbour Commissioners of Montreal, and transmitted to us, would be detrimental in causing or increasing the floods which take place at and opposite Montreal.

We have carefully considered the question, and are of opinion that the proposed works would not be detrimental in the sense mentioned—that is, that they would

not have any appreciable effect in either causing or increasing floods at or opposite Montreal.

We have the honour to be, Sir

Your obedient servants,

THOS. C. KEEFER.
HENRY F. PERLEY.
JOHN KENNEDY.

The undersigned does not join in the above report of the Flood Commission, because the question now submitted on behalf of the Montreal Harbour Commissioners does not embrace the consideration of the permanent dyke, which must be erected in connection with their work.

PERCIVAL W. ST. GEORGE.

A. GOBEIL, Esq.,

Secretary Department of Public Works,
Ottawa.

HARBOUR COMMISSIONERS OF MONTREAL.

SECRETARY'S OFFICE, MONTREAL, 10th January, 1890.

SIR,—

By direction of the Harbour Commissioners of Montreal I transmit by registered post this day copies of two plans of proposed harbour improvement and flood protection of the central portion of Montreal.

These are styled respectively, "Plan for enlargement of Montreal Harbour, adopted by the Harbour Commissioners of Montreal on 7th January, 1890;" and "Copy of Plan No. 6 A," referred to in section 2 of the by-law No. 174 of the City of Montreal, of which a certified copy is herewith enclosed.

At a meeting of the Commissioners on the 7th instant, it was resolved that the first mentioned be approved and

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a copy transmitted without delay, for the approval of Government; also, that a copy of Plan No. 6 A, as deposited in the custody of the City Surveyor, under the requirements of the above mentioned by-law, be likewise transmitted; and that both be accompanied by a memorandum setting forth the modifications in the number, position and dimensions of the piers between the entrance of the Lachine Canal and the Victoria Pier, as now designed to be constructed, and which modifications were provided for in Plan No. 6 A, as will be seen by reference to it and to section 2 of the by-law.

The Commissioners would remind the Honourable the Minister of the following steps taken by them in this important question, which has now been under their special consideration for two years past.

During the summer of 1887 they instructed their Engineer to submit a plan of harbour improvement during the following winter. This was done early in 1888, when the Commissioners transmitted a copy of the plan, with a description of it, to the Honourable the Minister of Public Works, with a request that he would obtain the opinion of the Montreal Flood Commission upon it as to the effect the proposed works might have on inundations, which opinion was duly received, and was in the sense that they would not, in the opinion of the Commission, increase the floods; while the description was also printed in the Trusts' Annual Reports for 1887.

During the spring of 1888 the City Council of Montreal requested that no new works should be commenced in the harbour until the question of flood protection had been considered, along with that of harbour improvements, with the result that a joint committee of the City Council and of the Commissioners was appointed, which, after deliberation, instructed the City Surveyor and Harbour Engineer to take the double subject into their con-

sideration in all its various phases, and to devise alternative plans which would cover the ground, which action was duly approved by the City Council and by the Board of Harbour Commissioners.

In January, 1889, six schemes were submitted to these two bodies, of which No. 6 was considered by both to be the best.

In March the Montreal Board of Trade called a public meeting, at which various plans were submitted, and a committee representative of all the different interests (shipping, railways, etc.) was appointed, which made the enclosed report in May.

On receipt of this report by the City Council and the Commissioners it was decided by the former that steps should at once be taken to submit to the citizens a by-law to authorize the expenditure of one million of dollars to enable the Council to carry out its portion of the proposed plan of harbour improvements and flood protection.

The various steps incidental to this have taken the intervening period, as the by-law was only approved by the municipal electors last week.

The Harbour Commissioners then took action in the matter, and, after due deliberation upon the different propositions that had been made during the summer, finally adopted the plan which is now transmitted to the Honourable the Minister of Public Works for his sanction, and with the respectful request that he may be pleased to obtain the approval of the same by the Governor in Council at the earliest date.

I have the honour to be, Sir,

Your obedient servant,

(Signed,) ALEXANDER ROBERTSON.

ANTOINE GOBEL, Esq.,
Secretary Department of Public Works,
Ottawa.

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St. George,
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MEMORANDUM setting forth the modifications in the number, position and dimensions of the piers between the entrance of the Lachine Canal and the Victoria Pier, to be constructed by the plan adopted by the Harbour Commissioners of Montreal on 7th January instant, as compared with those shown on plan No. 6A.

The points in which the plan adopted by the Harbour Commissioners of Montreal differs from plan No. 6A are :

1. Reduction of the number of piers between the entrance of the Lachine Canal and the Victoria Pier from five in plan No. 6A to four in the plan adopted.
2. Increase of width of these four piers from 175 feet in Plan No. 6A to 230 feet in the plan adopted.
3. Omission of the uppermost pier in plan No. 6A so as to leave a greatly enlarged space opposite the entrance of the Lachine Canal.

Certified.

(Signed,) ALEXANDER ROBERTSON,

Secretary.

HARBOUR COMMISSIONERS OF MONTREAL,

SECRETARY'S OFFICE, MONTREAL, 24th January. 1890.

SIR,—Referring to my communication of the 10th inst. which transmitted, by direction, two plans of Montreal harbour improvement and flood protection, and also four documents bearing upon them, I would also, by direction, request that the enclosure may be added to said letter, viz ; The copies of a letter from yourself dated 23rd June, 1888, and of one from the Montreal Flood Commission to you, dated 11th May, 1888.

With respect to this latter, I beg to point out that Mr. St. George, who originally declined to join in the report of 11th May, 1888, has to-day appended his concurrence

in said report, and to certify that the signature is his.

I have the honour to be, Sir,

Your obedient servant,

(Signed,) ALEXANDER ROBERTSON.

Secretary.

ANTOINE GOBEIL, Esq.,
Secretary, Department Public Works,
Ottawa.

DEPARTMENT OF PUBLIC WORKS,
OTTAWA, 23rd June, 1888.

SIR,—In reply to your telegram of the 11th instant, I am directed to enclose you a copy of the report of the Montreal Flood Commission, submitted to this Department on the 11th May last.

I have the honour to be, Sir,

Your obedient servant,

A. GOBEIL,

Secretary,

Per J. A. P.

ALEXANDER ROBERTSON, Esq.,
Secretary Harbour Commissioners,
Montreal.

MONTREAL FLOOD COMMISSION,
MONTREAL, 11th May, 1888.

SIR,—We beg to acknowledge the receipt of your letter of the 20th ultimo, asking the opinion of the Montreal Flood Commission as to whether the proposed enlargement of the Montreal harbour, according to plans laid before the Honourable the Minister of Public Works by the Harbour Commissioners of Montreal, and transmitted to us, would be detrimental in causing or increasing the floods which take place at and opposite Montreal.

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We have carefully considered the question, and are of opinion that the proposed works would not be detrimental in the sense mentioned—that is, that they would not have any appreciable effect in either causing or increasing floods at or opposite Montreal.

We have the honour to be, Sir,

Your obedient servants,

THOS. C. KEEFER,
HENRY F. PERLEY,
JOHN KENNEDY.

A. GOBELL, Esq.,

Secretary Department of Public Works,
Ottawa.

The undersigned does not join in the above report of the Flood Commission, because the question now submitted on behalf of the Montreal Harbour Commissioners does not embrace the consideration of the permanent dyke, which must be erected in connection with their work.

PERCIVAL W. ST. GEORGE.

MONTREAL, 11th May, 1888.

As the Flood Commission Report of 11th May, 1888, respecting the Guard Pier, did not include the construction of a permanent dyke in connection with the harbour improvements, I did not sign it as one of the Commissioners. Since that date, Scheme No. 6, embracing this and other flood protection works, has been prepared, I am now at liberty to concur in said report and hereby do so.

Signed,) PERCIVAL W. ST. GEORGE.

MONTREAL, 24th January, 1890.

Certified.

(Signed,) ALEXANDER ROBERTSON,

Secretary H. C. of M.

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STATEMENT
OF
GENERAL RECEIPTS AND DISBURSEMENTS
OF THE
HARBOUR COMMISSIONERS OF MONTREAL,
FOR THE YEAR 1890.

HARBOUR COMMISSIONERS OF MONTREAL,
SECRETARY'S OFFICE,
MONTREAL, 17th February, 1891.

WILLIAM SMITH, Esquire,
Deputy Minister of Marine,
OTTAWA.

SIR,

I have the honor, by direction of the Harbour Commissioners of Montreal, to forward herewith, for the information of the Honourable the Minister of Marine and Fisheries, Statement of the General Receipts and Disbursements of the Trust for the year ended 31st December, 1890.

The revenue from wharfage dues and rentals shows an increase over that of 1889 of about \$9,600, or $3\frac{1}{2}$ per cent.

The usual reports for the past year of the Montreal Decayed Pilots' Fund, the Montreal Pilotage District, the

Harbour Master, and the Chief Engineer on the Works for the Improvement and Maintenance of the Harbour, have already been forwarded you.

From the Harbour Master's report it will be seen that there was a large increase in the tonnage of ocean vessels over former years, while by that of the Chief Engineer it appears that the new wharves at Hochelaga and Maisonneuve made considerable progress, and that the ordinary repairs to the wharves and roadways were more extensive than usual.

The Commissioners, as in the two previous years, again published tide-tables for Cap à la Roche, which were much prized by the pilots and officers of vessels coming to the port.

I have the honour to be,

Sir,

Your obedient servant,

ALEXANDER ROBERTSON,

Secretary.

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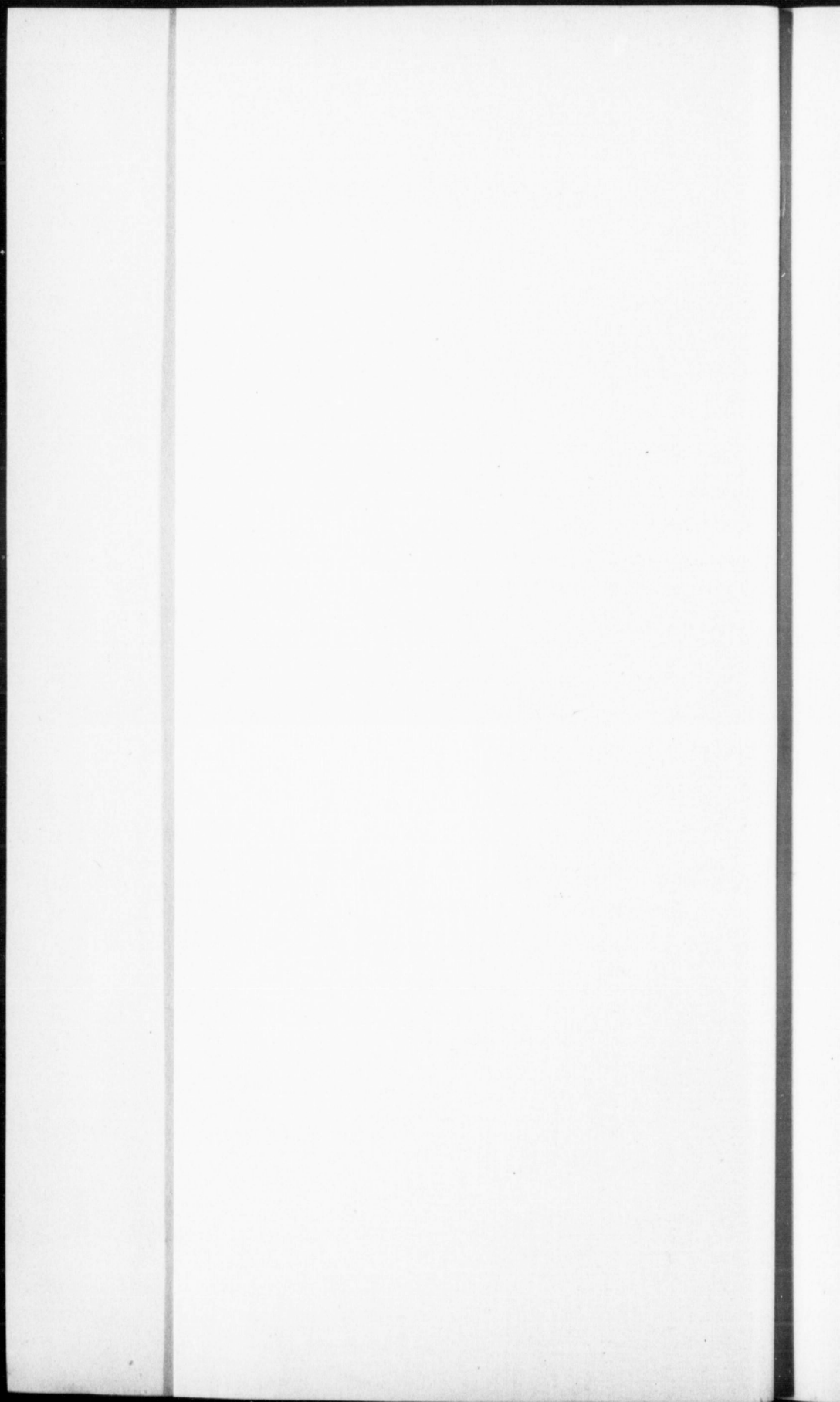
STATEMENT OF GENERAL RECEIPTS AND DISBURSEMENTS FOR THE YEAR ENDED 31st DECEMBER, 1890.

RECEIPTS	REVENUE.	CAPITAL.	DISBURSEMENTS.	REVENUE.	CAPITAL.
<i>Balance at 31st December, 1889.</i>					
Deposits in Bank of Montreal and Cash on hand	\$ 63,392 35		Harbour Revenue, Mrs. John Young, Annuity	\$ 600 00	
Deposit with Louis Pare, on account of Boom Dues and Canal Tolls	34 18		" " Account written off	18 00	
" " Wm. L. Scott, on account of Buoy service	20 23		" " Refunds of Wharfage Dues on Sugar, etc., short landed	534 73	
Sundry amounts due for Wharfages, &c.	\$ 17,997 15		Harbour Survey, Soundings and Sundry Surveys	978 20	
Less, Coupons not presented as yet	657 50		" Repairs, Maintenance of Wharves and Roadways (see contra for credit)	56,852 77	
Value of Macadamizing Stone, Coal, Timber, Lumber, and Tree-nails in store	17,329 65		" Interest, on Debentures and Government Demand Loan (see contra for credit)	\$113,670 48	
Securities and Deposit in Montreal City and District Savings' Bank, held in trust for Montreal Decayed Pilots' Fund	17,394 53	\$144,983 18	" " Bank of Montreal for paying coupons	263 40	
<i>From Collector H. M. Customs, Montreal.</i>			" Expenses, Taxes, Lighting, Heating, &c., &c., (see contra for credit)	113,933 88	
Wharfage Dues on Imports	145,137 19		" Salaries, of Administrative Staff	10,367 56	
Exports	85,343 43	\$230,480 62	Electric Lighting, Rental of Water Power, &c., &c., for 1889 in part	10,980 04	
<i>From Wharfinger for Local Traffic.</i>			Cost of, under Contract, for 1890 (see contra for credit)	327 43	
Wharfage Dues on Goods Inwards	9,898 59		Travelling and Incidental Expenses	4,628 20	
" Outwards	2,280 35		Printing, Stationery, Postage Stamps, &c., &c.	139 00	
Commutation of Richelieu & Ontario Nav. Coy's Wharfage Dues	10,000 00		Legal and Notarial Expenses	1,450 91	
Rental of Jacques Cartier Basin for small boats	50 00		Pilotage Expenses, Salary of Quebec Agent, &c., (see contra for credit)	1,017 95	
Rentals of Spaces for piling Lumber	2,105 35		Buoys and Beacons, Sundry expenses for storing buoys during winter of 1889-1890 (see contra for credit)	780 70	
" Coal	1,186 70		Harbour Railway, award of Arbitrators, &c., for Wharf Tracks (see contra for credit)	422 28	\$ 13,760 00
" " Small Offices	949 80		Plant, Bolt Cutter, Wells' Lights and Instruments, (see contra for credit)		848 94
" " Scales	900 00		New Spoon Dredge, Hull, Fitting up Machinery, &c.		19,800 23
" " piling Firewood	618 60		New Floating Shop, Hull and Fitting up		1,486 55
" " Scrap Iron	90 00		Harbour Dredging in connection with new wharves at Hochelaga and Maisonneuve (see contra for credit)		50,599 22
" " Phosphates	70 08		New Hochelaga and Maisonneuve Wharves, Crib-work, Back-filling and Macadamizing (see contra for credit)		68,029 02
From Canadian Pacific Railway Company, rental of wharf tracks	2,149 47		Ship Channel through Harbour, removal of boulder shoals in Current St. Mary		2,737 34
" Grand Trunk Railway Company,	2,234 50		Harbour Dredging, Enlargement of Windmill Point Basin		395 56
" Department of Railways and Canals, rental of its offices in Harbour Building	812 50		Montreal Decayed Pilots' Fund, pensions to old Pilots and Widows of Pilots	\$4,055 49	
" Department of Marine, rental of Steamboat Inspector's office	1,250 00		Audit of Fund for 1889, Postage, &c.	52 16	4,107 65
" John Lee & Co., rental of part of Harbour yard	62 50		Total Disbursements on Capital Account		161,764 56
" Sincennes-McNaughton Line, for Buoy Tools and Appliances	250 00		<i>Balance at 31st December, 1890.</i>		
" An Anonymous Sender, in a registered letter from St. Henri de Montreal	498 70		Special Deposit in Bank of Montreal at Interest	\$100,000 00	
" City of Montreal, David Shaw, Richelieu & Ontario Nav. Co., and P. D. Dods & Co., account Harbour Repairs	20 00		Deposit in Bank of Montreal at credit of Coupon account	125 00	
" City of Montreal Rebate and Refund of Taxes, account Harbour Expenses	472 87		Current account	23,427 27	
" Craig & Sons, rental of Water Power, care of Dynamos, &c., for 1890 received in all	102 95		Cash on hand	\$2,304 58	
Less due as per deductions in contra balance	\$611 43		Amount due by Canadian Pacific Railway for rental of Wharf Tracks, &c.	59 55	
account Electric Lighting	260 58		" " by Rich. & Ont. Nav. Co.	59 55	
" Cyrille Belleisle, Pilot, fine for grounding SS. "Catalan," account Pilotage Expenses	350 85		Less Due Messrs Craig & Sons	\$110 03	
" Craig & Sons, interest on purchase price of Electric Light Plant, as per contract, account Harbor Interest	40 00		" Coupons outstanding	742 50	
" Sundry Purchasers, Premium and Accrued Interest on Bonds	214 21		" Due Department of Railways and Canals	150 50	
" Grand Trunk Railway Company, half expense of arbitration <i>in re</i> Harbour Railway	1,314 07		Value of Macadamizing Stone in store	\$ 2,609 29	
" Sincennes-McNaughton Line, for transit sold it, account Harbour Plant	12 50	12 50	" Coal	1,199 68	
" Calvin Co'y, for damage to Dredge, and by Sundries, account Harbour Dredging	200 00		" Timber	13,359 20	
" Hochelaga Cotton Manufacturing Co., labour on Culvert, account New Construction	57 70		" Lumber	890 95	
" Craig & Sons, one-fifth purchase price of Electric Light Plant	266 73		" Treennails	565 00	
" Sundry purchasers, for 4 per cent. Harbor Debentures sold	1,598 45		Total Disbursements on Revenue Account	18,624 12	
For Montreal Decayed Pilots' Fund, Trinity Dues or 5 per cent. on Pilots' earnings	140,000 00		Total Disbursements	145,871 00	203,031 65
Do, Interest on Investments and on Cash in Bank	\$2,799 15	5,366 73	<i>Montreal Decayed Pilots' Fund (in trust for):</i>		
Total Receipts on Capital Account	\$292,485 29	\$292,485 29	Montreal Harbour Debentures	\$42,000 00	
" Revenue	266,253 24	266,253 24	City of Montreal Consolidated Fund	5,000 00	
			Deposit in Montreal City and District Savings' Bank at Interest	1,071 32	193,942 32
				48,071 32	\$ 558,738 53
TOTAL RECEIPTS		\$558,738 53			

HARBOUR COMMISSIONERS' OFFICE,
MONTREAL, 17th February, 1891.

Verified (Signed) RIDDELL & COMMON, Auditors,
MONTREAL, 17th February, 1891.

ALEXANDER ROBERTSON,
Secretary.



[COPY]

57

WESTERN CHAMBERS,

22 St. John street,

MONTREAL, February 17th, 1891.

The Chairman

of the Harbour Commissioners of Montreal,

MONTREAL.

DEAR SIR,

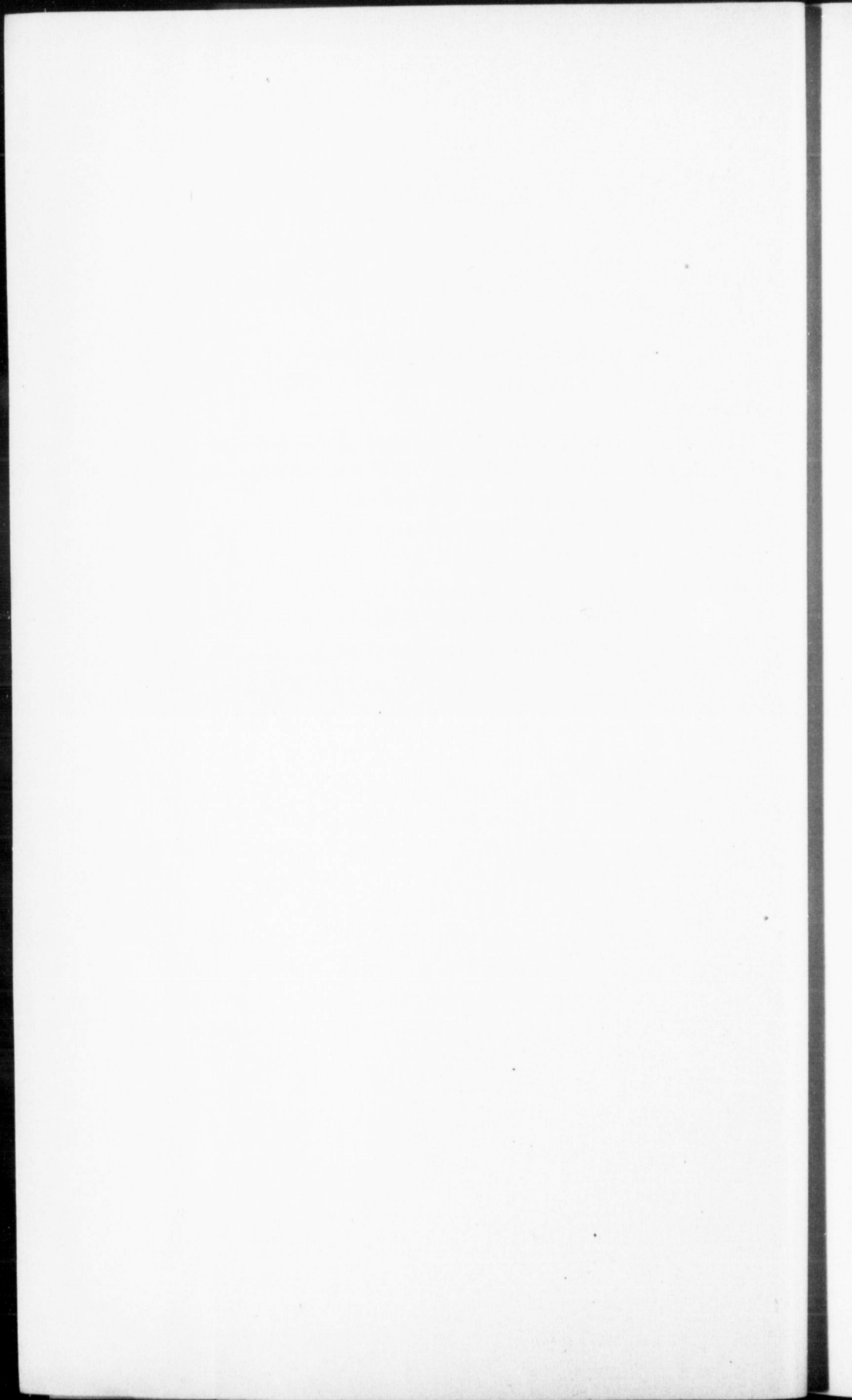
We beg to report having completed the audit of your Secretary-Treasurer's books for the year ending 31st December, 1890, and that the balance sheet and statement of "General Receipts and Disbursements" herewith submitted, bearing our certificate, are correctly drawn up therefrom.

We have found everything correct and in good order.

Your obedient servants,

RIDDELL & COMMON,

Auditors.



REPORT
OF THE
PILOTAGE DISTRICT OF MONTREAL
FOR THE YEAR 1890.

HARBOUR COMMISSIONERS OF MONTREAL,
Secretary's Office,
MONTREAL, January 10th, 1891.

WILLIAM SMITH, ESQ.,
Deputy Minister of Marine,

OTTAWA.

SIR :—

I have the honour, by direction of the Harbour Commissioners of Montreal, as the Pilotage Authority, to transmit, for the information of the Honourable the Minister of Marine and Fisheries, the following report of the Pilotage District of Montreal for the year ended 31st December, 1890.

There were no deaths or superannuations among the fifty pilots during the year, consequently none of the apprentice pilots received their branches.

Pilot Hubert A. Bellisle, having attained the age of 65 years, was brought before the Commissioners on 22nd April, and, after examination, granted a new license for one year.

The accompanying statement gives the names, earnings, &c., &c., of all the pilots for the past season.

The total amount of pilotage dues therein shown was received from the following services, viz. :—

BRITISH.		
Steamships	\$50,113 90	
Sailing Vessels.....	2,614 37	\$52,728 27
FOREIGN.		
Steamships.....	\$ 2,770 95	
Sailing vessels.....	732 63	3,503 58
Total.....		\$56,231 85

In March an examination was held for those apprentice pilots who had been licensed five years, and had fulfilled all the preliminary requirements of the by-laws.

Messrs. J. B. Nadeau, and Aubert Naud, presented themselves, and, having passed a creditable examination, were ordered to spend one year making at least fifteen double trips, between Quebec and Montreal with branch pilots. This order having been carried out, they now stand fifth and sixth in order for their branches.

One apprentice has been removed from the list, being now over age, and four young men were licensed during the autumn.

The following list shows the name, age, and residence of each apprentice pilot now serving his time under this authority:—

No.	NAME.	AGE.	RESIDENCE.
1	Brière, Arthur	33	Portneuf.
2	Labranche, J. S	34	"
3	Perrault, Alexis	28	Deschambault.
4	Dufresne, N. C	30	"
5	Nadeau, J. B	32	Lévis.
6	Naud, Aubert	36	Deschambault.
7	Bouillé, Narcisse	30	"
8	Léveillé, Joseph	27	Batiscan.
9	Sauvageau, Josephat	28	Deschambault.
10	Dussault, Napoléon	28	"
11	Perron, Sévère	32	"
12	Arcand, Barthélemi	28	Lachevrotière.
13	Bellisle, Prudent	27	Deschambault.
14	Arcand, George	26	Lachevrotière.
15	Toupin, Constant	24	Three Rivers.
16	Perrault, George	24	Deschambault.
17	Belisle, Arthur	29	"
18	Bélangier, Charles	20	Lotbinière.
19	Pleau, J. E	21	St. Anne de la Pérade.
20	Hamelin, Théodule	16	Grondines.
21	Perrault, Anthyme	22	Deschambault.
22	Raymond, J. N	20	"

Accidents to vessels were few, and only one was of a serious nature.

On 12th of August an investigation was held into the grounding of the Spanish Steamship "Catalan" on the 1st August, while in charge of Pilot Cyrille Bellisle and approaching her berth at Windmill Point Wharf, within Montreal Harbour.

After hearing the evidence the Commissioners decided that the grounding was due to want of proper care and diligence on the part of the pilot, and fined him \$40, on payment of which he was reinstated.

On the 6th of August the steamship "Lake Nepigon," when leaving the harbour of Quebec, ran into the barque "Isabel," lying at one of the wharves, and cut her in two.

The Commissioners, after the hearing of witnesses on both sides, decided that the accident was due to the pilot, Jean Arcand, and he was accordingly suspended until the 1st of September, in addition to forfeiting his pilotage dues for the trip.

A complaint was received from Messrs. Kingman, Brown & Co., that on 2nd September Pilot George Dufresne went on board the Steamship "Coban," in Quebec, in an intoxicated condition.

The pilot was summoned before the Commissioners, and being, after due deliberation, found guilty, it was decided to withdraw his branch until such time as the Commissioners are satisfied that he has reformed his habits. At the close of the year the pilot was still under suspension.

On the 14th of October a slight collision took place in Lake St. Peter between the Steamship "Michigan," while on her way from Quebec in charge of Pilot A. Frenette, and the Steamship "Ocean King" in charge of Pilot John Nault, who was following the former vessel.

After hearing many witnesses on both sides the Commissioners decided that both pilots were to blame for having infringed by-law No. 97 A, and both were censured, the former more especially; and warned that in the event of a re-occurrence of any such case the Commissioners will deal with it as severely as their powers will permit.

The maintenance of the buoys and beacons, by the Sincennes-McNaughton Line, was carried out, during the season, to the general satisfaction of the Commissioners.

The new temporary floating lights at Ste. Croix and Pointe aux Trembles (*en bas*) placed in September, were

found of great service by the pilots and shipping interest.

Early in the season by-law 133 A was put in force in place of 133. The new one enumerated eleven additional points to those mentioned in 133, where upcoming vessels have to give way to downward bound ones.

The tariff of pilotage at present in force is the same as was transmitted in the report for 1888, and as has been in force since 5th March, 1877.

The following is an extract from it:—

QUEBEC TO MONTREAL AND VICE VERSA.	DOWNWARDS.	UPWARDS.
Pilotage of vessels in tow of steamers, for each foot of draft of water.....	\$2 00	\$2 00
Pilotage of vessels propelled by steam, for each foot of draft water.....	2 50	2 50
Pilotage of vessels under sail, for each foot of draft of water.....	2 80	4 20
Moving a vessel from one wharf to another in the Harbour of Montreal, or from the Harbour into the Lachine Canal.....	5 00	5 00

The amounts received and expended by the Harbour Commissioners, as Pilotage Authority of the District, were as follows:—

RECEIPTS.

Trinity dues collected at Montreal.....	\$2,642 31
“ “ “ “ “ Three Rivers.....	34 01
“ “ “ “ “ Sorel.....	100 55
Sundry small amounts of poundage.....	22 28
Interest on investments and on cash in bank.....	2,567 58
Total	\$5,366 73

DISBURSEMENTS.

Pensions to old and infirm Pilots and Widows.....	\$4,055 49
Messrs. Riddell & Common for audit of fund.....	25 00
Postage on Pensions remitted during the year.....	5 31
Messrs. Wulff & Co., refund of poundage paid twice.....	1 85
Total	\$4,087 65

The above receipts and disbursements were in trust for the Montreal Decayed Pilot Fund, of which the annual report and statements were sent you on 2nd January, certified by Messrs. Riddell & Common, chartered accountants.

In addition, the Commissioners received in respect of pilots and pilotage, as follows :—

From Pilot C. Bellisle, amount of fine inflicted on him for grounding the Steamship "Catalan".... \$ 40 00

and they disbursed the following :—

On examination of apprentices.....	\$ 85 70	
Messrs. Abbotts, Campbell & Meredith, for professional services.....	30 00	
Messrs. McLean, Kennedy & Co., amount awarded to S.S. "Catalan" for extra expenses when aground.....	40 00	
Stationery.....	10 00	
Expenses of Quebec Agent and office.....	605 00	
Expenses of Water Bailiff serving summons at Quebec.....	10 00	
		\$780 70

The deficiency of \$740.70 was made up out of the Harbour Revenues.

I have the honour to be, Sir,

Your obedient servant,

ALEXANDER ROBERTSON,

Secretary.

STATEMENT showing the number of Branch Pilots for and above the Harbour of Quebec, on the Active List, on the 31st December, 1890, their Age, Residence, Number of Pilotages, Earnings, and whether employed on Special Service or on Tour-de-Rôle.

No.	NAMES.	AGE.	RESIDENCE.	DATE OF BRANCH.	REMARKS.	No. of Trips		No. of Trips		Total No. of Trips.	Earnings to Montreal.	Earnings to intermediate Ports.	Total Earnings.	Employed on Special Service or on Tour-de-Rôle.
						to Montreal.		to intermediate places.						
						IN.	OUT.	IN.	OUT.					
1	Bouillé, Zéphérin...	62	Deschambault	March 1, 1855		12	12			24	\$ 1,361 00	\$	\$ 1,361 00	Allan Line.
2	Bélisle, Cyrille....	63	Deschambault	November 15, 1860	{ Fined on 19th August }	10	9	3	2	24	698 76	110 44	809 20	Tour-de-Rôle.
3	Naud, Augustia....	64	Montreal	December 4, 1861		17	20	2	2	41	1,142 66	110 63	1,253 29	H. Dobell & Co.
4	Bélisle, Hubert A..	65	Deschambault	May 25, 1862		10	4	1		15	562 43	19 50	581 93	Tour-de-Rôle.
5	Dufresne, Athanase.	57	Deschambault	March 2, 1862		17	16			33	1,172 38		1,172 38	Ross & Co., Que.
6	Gagnon, Pierre....	63	Three Rivers	November 27, 1866	Member P. C. 1891.	11	13	1	1	26	1,179 09	53 82	1,232 91	Allan Line.
7	Naud, Onéime....	50	Deschambault	March 16, 1870		11	11			22	1,217 66		1,217 66	Allan Line.
8	Hamelin, J. Octave.	57	Deschambault	March 16, 1870		24	23	4	4	55	1,500 35	225 78	1,726 13	Intercolonial Co.
9	Chandonnet, Jos...	50	{ St. Henri de Lauzon, Lévis }	August 2, 1870		14	16			30	1,683 12		1,683 12	Beaver Line.
10	Bouillé, Louis A....	51	Deschambault	September 1, 1870		10	10			20	1,133 72		1,133 72	Allan Line.
11	Boudet, Prudent...	49	Lotbinière	October 10, 1870	{ Member Pilots' Committee 1890. }	11	12			23	1,299 39		1,299 39	Dominion Line.
12	Bélisle, Elzéar....	56	Deschambault	October 10, 1870		15	15			30	652 87		652 87	Quebec S. S. Co.
13	Pleau, Joseph....	53	St. Anne de la Pêrade	October 10, 1870		10	7	1	1	19	629 49	52 50	681 99	Tour-de-Rôle.
14	Brunet, Célestin...	48	Montreal	February 28, 1872		15	20			35	1,741 36		1,741 36	Donaldson Line.
15	Bélisle, Louis....	45	Deschambault	February 28, 1872		11	12			23	1,303 30		1,303 30	Dominion Line.
16	Caien, Damase....	50	Portneuf	October 1, 1872		10	11	2	1	24	684 35	78 00	762 35	S.S. "Grandholme."
17	Groleau, Ulric....	43	Grondines	October 30, 1872	Member P. C. 1891.	8	9	2	1	20	557 00	89 06	646 06	Tour-de-Rôle.
18	Frenette, Alfred....	51	Portneuf	October 30, 1872	{ Severely censured on 28th Oct. }	11	14			25	1,260 63		1,260 63	McLean Line.
19	St. Amant, Alfred..	47	Deschambault	October 30, 1872		16	16	4	5	41	870 63	247 81	1,118 44	J. & R. McLea.
20	Bélangier, Philippe..	52	Lotbinière	April 8, 1874		10	10	3	3	26	642 16	163 69	805 85	Tour-de-Rôle.
21	Gagnon, Victor....	52	Champlain	April 9, 1874		9	11	2	1	23	694 53	86 00	780 53	Tour-de-Rôle.
22	Perrault, Narcisse..	53	Deschambault	April 10, 1874	{ Member P. C. 1890, President P. C. 1891. }	44	14			28	1,460 50		1,460 50	Donaldson Line.
23	Toupin, Treflé....	43	{ Lake Bouchette, Lake St. John. }	September 22, 1874		9	14	1	1	25	739 99	50 25	790 24	{ Tour-de-Rôle and "Tudor Prince" during July & Aug }
24	Auger, Cléophas....	44	Point Lévis	September 22, 1874	{ President Pilots' Com. 1890. }	14	15			29	1,635 36		1,635 36	Beaver Line.
25	Desjordy, François..	46	Lavaltrie	April 8, 1875		10	4	2	2	18	443 57	88 75	532 32	Tour-de-Rôle.
26	Labranche, Ferdin'd	45	Portneuf	April 8, 1875		12	12			24	1,330 77		1,330 77	Dominion Line.
27	Perrault, David....	49	Deschambault	April 9, 1875		12	12			24	1,249 97		1,249 97	Thomson & Ross line
28	Gauthier, Alexis....	44	Deschambault	January 15, 1878		12	10			22	1,164 14		1,164 14	Allan Line.
29	Bouillé, Louis Z....	42	Deschambault	January 16, 1878	{ Secretary Pilots' Com. 1890. }	11	11			22	1,242 32		1,242 32	Allan Line.
30	Toupin, Joseph....	41	Champlain	November 15, 1878		25	25	2	1	53	1,816 82	76 91	1,893 73	Black Diamond line.
31	Gauthier, Laurent..	41	Deschambault	December 10, 1879		12	13			25	1,446 53		1,446 53	Dominion Line.
32	Arcand, Jean....	38	Deschambault	December 10, 1879	{ Suspended from 8th August to 1st September. }	8	9	1		18	600 43	26 25	626 68	Tour-de-Rôle
33	Nault, Delovoie....	39	Deschambault	December 10, 1879		22	24			46	1,872 90		1,872 90	Black Diamond line.
34	Gauthier, Wilbrod..	39	Deschambault	December 10, 1879	{ Member Pilots' Com. 1890. }	11	11			22	1,196 37		1,196 37	Allan Line.
35	Mayrand, Louis....	43	St. Anne de la Pêrade	December 9, 1880		23	24	9	8	64	1,189 45	514 86	1,704 31	F. C. Henshaw.
36	Dufresne, George...	42	Deschambault	December 10, 1880	{ Suspended from 30th September. }	9	5			14	562 87		562 87	Tour-de-Rôle.
37	Arcand, Norbert...	38	Champlain	December 10, 1880	Member P. C. 1891.	9	15	1	1	26	812 82	66 19	879 01	Tour-de-Rôle.
38	Toupin, Uldoric....	36	Champlain	December 11, 1880		7	11	1	1	20	698 58	64 50	763 08	Tour-de-Rôle.
39	Bouillé, Tancrède...	37	Deschambault	December 11, 1880	Sec'y Pilots' Com. 1891	11	11			22	1,103 11		1,103 11	Hansa Line.
40	Arcand, Nestor....	35	Deschambault	February 20, 1884		20	20	7	7	54	999 20	428 94	1,428 14	Carbray, Routh & Co
41	Nault, John....	34	Deschambault	February 20, 1884	{ Censured on 28th October. }	13	14	1		28	1,284 37	23 44	1,307 81	Thomson & Ross line
42	Dussault, Joseph...	35	Deschambault	February 20, 1884		17	20	2	1	40	1,294 24	76 44	1,370 68	J. & R. McLea.
43	Groleau, Gédéon...	37	Grondines	May 20, 1887		9	6			15	655 58		655 58	Tour-de-Rôle.
44	Bélisle, Néré....	38	Deschambault	May 20, 1887		20	15	1		36	1,332 87	33 75	1,366 62	Black Diamond line.
45	Perrault, Liboire...	41	Deschambault	April 20, 1888		10	8	3	3	24	515 69	156 25	671 94	Tour-de-Rôle.
46	Raymond, Wilfrid..	36	Deschambault	April 20, 1888		12	12			24	1,259 59		1,259 59	Thomson & Ross line
47	Hurteau, Joseph....	30	Contrecoeur	March 20, 1889		8	12	2	3	25	599 59	133 00	732 59	Tour-de-Rôle.
48	Perrault, Edouard..	39	Deschambault	March 20, 1889		11	10	2	2	25	655 73	104 50	760 23	Tour-de-Rôle.
49	Bouillé, Lydoric....	34	Deschambault	March 20, 1889		11	13			24	1,188 32		1,188 32	Hansa Line.
50	Dussault, Honoré...	37	St. Petronille	July 16, 1889		10	11	3	3	27	591 67	160 36	752 03	Tour-de-Rôle.
Total..											\$52,990 23	\$3,241 62	\$56,231 85	

HARBOUR COMMISSIONERS' OFFICE,
MONTREAL, 10th January, 1891. }

ALEXANDER ROBERTSON,
Secretary.

REPO

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H

WILLIAM SMITH

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SIR,—

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year ended 31
to the Fund a

REPORT AND STATEMENTS
OF THE
MONTREAL DECAYED PILOT FUND,
FOR THE YEAR 1890.

HARBOUR COMMISSIONERS OF MONTREAL,
SECRETARY'S OFFICE,
MONTREAL, 2nd January, 1891.

WILLIAM SMITH, Esquire,
Deputy Minister of Marine,
OTTAWA.

SIR,—

I have the honour, by direction of the Harbour Commissioners of Montreal, to transmit herewith for the information of the Honourable the Minister of Marine and Fisheries, the usual statements of (1) Receipts and Disbursements of the Montreal Decayed Pilot Fund for the year ended 31st December, 1890, and (2) Assets belonging to the Fund at 31st December, 1890.

The following is an abstract of the former :—

RECEIPTS.	
From Trinity Dues collected at Montreal.....	\$2,642 31
“ “ “ “ “ Sorel.....	100 55
“ “ “ “ “ Three Rivers.....	34 01
“ Sundry small amounts of poundage.....	22 28
	\$ 2,799 15
“ Interest on Investments and on Cash in Bank	2,567 58
	\$ 5,366 73

DISBURSEMENTS.	
Paid Pensions to old and infirm Pilots and Widows of Pilots.....	\$4,055 49
“ Messrs. Riddell & Common, for audit of Fund	25 00
“ Postage on Pensions remitted during the year	5 31
“ Wulff & Co. amount of poundage on Barque “ Askoy,” received on 2nd August from Norbert Arcand, same amount having been called for and paid to Collector H. M. Customs on 26th August, accordingly twice paid	1 85 \$ 4,087 65
Showing a net gain for the year of.....	\$ 1,279 08
As there was also a gain in 1889 of.....	874 55

two, 4 per cent, Harbour Bonds were purchased to invest this surplus.

There were three deaths among the pensioners, namely, those of old pilot Joseph L. Dessureau on 9th July; Widow Hector Hamelin and old pilot Adolphe Lisé, both on 12th October.

The widows of the two deceased superannuated pilots were placed on the list of pensioners, which has now on it four old pilots and seventeen widows, at the same rates as last year.

I have the honour to be,

Sir,

Your obedient servant,

ALEXANDER ROBERTSON,

Secretary.

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2,567 58

5,366 73

4,087 65
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SEE NEXT PAGE FOR TREASURER'S STATEMENT.

Dr. ALEXANDER ROBERTSON, TREASURER, IN ACCOUNT

1890		
Jan.	2..To balance from December, 1889.....	\$ 1,812 24
"	9..To six months' interest due 1st January on the shares of the City of Montreal Consolidated Fund, viz., \$5,000, 5 per cent. stock.....	125 00
"	13..To Harbour of Montreal, Coupons <i>due 5th Jan</i>	
	Series M, Nos. 154-156= 3 × \$32.50=	\$ 97.50
"	N, Nos. 36- 43= 8 × 65.00=	520.00
"	P, No. 81= 1 × 60.00=	60.00
"	R, Nos. 20 and 102= 2 × 15.00=	30.00
"	R, Nos. 117-119= 3 × 30.00=	90.00
"	D, Nos. 21 and 45-49= 6 × 25.00=	150.00
"	F, Nos. 164-172= 9 × 20.00=	180.00
		1,127 50

Forward..... \$ 3,064 74

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"	" Old Pi
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"	12 "
"	" "
"	17..Old Pil
April 1	Riddell
	year

WITH THE DECAYED PILOT FUND.

Cr.

1890

Feb. By Pensions paid to the following for three months
ended 31st January :—

"	1	Widow Olivier Abelle, Montreal.....	\$ 37 33
"	"	" Hubert Lemay, do	37 33
"	3	" Zepherin Boudreau, Three Rivers.....	37 33
"	"	" Edouard Boudreau, do	37 33
"	"	" Isaie Beaudry, Sorel.....	37 33
"	"	" David Bouillé, Deschambault.....	29 33
"	"	" Narcisse Bouillé (née Proulx), Deschambault	37 33
"	"	" Sévère Bellisle, Deschambault.....	37 33
"	"	" Placide Gaillardet, St. Gregoire.....	37 33
"	"	" David Mathieu, Grondines.....	32 00
"	"	" Zépherin Mayrand, Contreccœur.....	87 33
"	"	" Edouard Naud, Sorel.....	32 00
"	"	" Eusébe Toupin, Three Rivers.....	32 00
"	"	" Old Pilot Jos. L. Dessureau, Sorel.....	75 00
"	"	" J. B. Dorval, Cape de la Madeleine.....	75 00
"	"	" Adolphe Lisé, Batiscan.....	75 00
"	"	" Onesime Naud, Sorel.....	75 00
"	"	" George Raymond, Deschambault.....	75 00
"	7	Widow Hector Hamelin, St. Pierre les Bequets	37 33
"	12	" Narcisse Bouillé (née Arcand), Deschambault	37 33
"	"	" Olivier Raymond, Montreal.....	37 33
"	17..	Old Pilot Joseph Leveille, Montreal	75 00
April 1		Riddell and Common, for audit of this Fund for the year ended 31st December, 1889.....	25 00

Forward \$1,048 29

Dr. ALEXANDER ROBERTSON, TREASURER, IN ACCOUNT

1890			
May		<i>Forward</i>	\$ 3,064 74
	31..	Trinity dues for May from Collector H. M. Customs, Montreal.....	275 38
June	7..	Poundage (additional) for difference of draft from—	
"	"	Do do Carbray, Routh & Co.....	31
"	9	Do do Munderloh & Co	12
"	"	Do do Kingman, Brown & Co.....	06
"	10	Do do F. C. Henshaw.....	12
"	11	Do do H. E. Murray	06
"	"	Do From C. Brunet on S. S. "Nithsdale," with 11 feet draft, from Montreal to Charlemagne...	55
"	12	Do (additional) for difference of draft from R. Reford & Co.....	39
"	16	Do From Carbray, Routh & Co., on S. S. "Acuba".....	09
"	27	Do on S. S. "Cynthia" for trip on which she was lost in May, 1889.....	2 68
"	30..	Trinity dues for June from Collector H. M. Customs, Montreal.....	410 62
July	5..	Six months' interest due 1st July, on the shares of the City of Montreal Consolidated Fund, viz., \$5,000 of 5 per cent stock.....	125 00
"	10..	Harbour of Montreal Coupons due 5th July :—	
		Series M, Nos. 154-156= 3 × \$32.50=	\$ 97.50
		" N, Nos. 36- 43= 8 × 65.00=	520.00
		" P, No. 81= 1 × 60.00=	60.00
		" R, Nos. 20 and 102= 2 × 15.00=	30.00
		" R, Nos. 117-119= 3 × 30.00=	90.00
		" D, Nos. 21 and 45-49= 6 × 25.00=	150.00
		" F, Nos. 164-172= 9 × 20.00=	180.00
			1,127 50
"	31..	Trinity dues for July from Collector H. M. Customs, Montreal	459 98
		<i>Forward</i>	\$ 5,467 60

WITH THE

1890		
May	1..	Pensi
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WITH THE DECAYED PILOT FUND.—*Continued.*

Cr.

	1890		
		<i>Forward</i>	\$ 1,048 29
3,064 74	May 1..	Pensions paid to the following for three months ended	
		30th April :—	
275 38	" "	Widow Olivier Abelle, Montreal.....	37 33
31	" "	" Hubert Lemai, do	37 33
12	" "	" Zepherin Boudreau, Three Rivers.....	37 33
06	" "	" Edouard Boudreau, do	37 33
12	" "	" Isaie Beaudry, Sorel.....	37 33
06	" "	" Placide Gaillardet, St. Gregoire.....	37 33
55	" "	" David Mathieu, Grondines.....	32 00
	" "	" Edouard Naud, Sorel.....	32 00
39	" "	Old Pilot Jos. L. Dessureau.....	75 00
	" "	" Adolphe Lisé, Batiscan.....	75 00
09	" "	" Onesime Naud, Sorel.....	75 00
	" "	" George Raymond, Deschambault.....	75 00
2 68	" 2	" Joseph Leveille, Montreal.....	75 00
410 62	" "	Widow David Bouille, Deschambault.....	29 33
	" "	" Narcisse Bouille (née Hortense Proulx), Deschambault	37 33
125 00	" "	" Sévère Bellisle, Deschambault.....	37 33
	" "	" Zepherin Maryrand, Contrecoeur.....	37 33
	" "	" Eusébe Toupin, Three Rivers.....	32 00
	" 3	" Narcisse Douillé (née Arcand), Deschambault	37 33
	" 9	Old Pilot J. B. Dorval, Cap de la Madeline.....	75 00
	" "	Widow Olivier Raymond, Montreal	37 33
	" 13	" Hector Hamelin, St. Pierre les Becquets..	37 33
1,127 50	" 18..	Postage on Pensions remitted in February and up to date	2 75
459 98			
5,467 60		<i>Forward</i>	\$ 2,074 33

Dr. ALEXANDER ROBERTSON, TREASURER, IN ACCOUNT

1890		
Aug.	Forward.....	\$ 5,467 60
"	2.. Poundage (additional) on Norwegian Barque "Flied," for error in draft when cleared.....	12
"	" Poundage from Pilot Norbert Arcand on Barque " Askoy," brought from Quebec to Montreal with draft of 18 feet 6 inches.....	1 85
"	29.. Poundage (additional) on S. S. "Andergorm," for difference in draft.....	14
"	30.. Trinity dues for August from Collector H. M. Cus- toms, Montreal.....	400 78
Sept.	".. Trinity dues for September from Collector H. M. Customs, Montreal.....	405 70
"	".. Poundage from Joseph Hamelin, Pilot, on his pilotage for the removal of the Barque "Karnack" from wharf at section 40 to the New Pier Wharf at Maisonneuve	25
Oct.	20.. Poundage on the pilotage of H.M.S. "Canada" up and down in September with 20 feet draft, the pilots being Jean Arcand and Lydoric Bouillé.....	5 00
"	25.. Poundage on the pilotage of H.M.S "Thrush" up and down in September with 13 feet draft, the pilot being Honoré Dussault.....	3 24
"	31.. Trinity dues for October from Collector H. M. Cus- toms, Montreal.....	382 91
		<hr/>
		Forward..... \$ 6,667 59

WITH THE

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"	5.. Wido
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WITH THE DECAYED PILOT FUND.—*Continued*

Cr.

1890		
5,467 60	Aug.	<i>Forward</i> \$2,074 33
		Pensions paid to the following for three months ended 31st July :—
12	" 1..	Widow David Mathieu, Grondines..... 32 00
	" "	" Hubert Lemay, Montreal..... 37 33
	" 2 "	" Olivier Abelle, do 37 33
	" 4..	Old Pilot J. B. Dorval, Cap de la Madeline..... 75 00
1 85	" 5..	Widow Olivier Raymond, Montreal..... 37 33
	" 6..	Old Pilot Joseph Leveille, do 75 00
	" "	Widow Zepherin Boudreau, Three Rivers..... 37 33
14	" "	" Edouard Boudreau, do 37 33
	" "	" Isaie Beaudry, Sorel..... 37 33
400 78	" "	" David Bouille, Deschambault..... 29 33
	" "	" Narcisse Bouillé (née Marie Anne Arcand), Deschambault..... 37 33
405 70	" "	" Narcisse Bouillé (née Hortense Proulx), Deschambault..... 37 33
	" "	" Sévère Bellisle, Deschambault..... 37 33
	" "	" Placide Gaillardet, St. Gregoire..... 37 33
	" "	" Hector Hamelin, St. Pierre les Becquets.... 37 33
	" "	" Zepherin Mayrand, Contrecoeur..... 37 33
25	" "	" Edouard Naud, Sorel..... 32 00
	" "	" Eusébe Toupin, Three Rivers..... 32 00
	" "	Old Pilot Adolphe Lisé, Batiscan..... 75 00
	" "	" Onesime Naud, Sorel..... 75 00
5 00	" "	" George Raymond, Deschambault..... 75 00
	" 21..	Widow J. L. Dessureau, Sorel, the amount which would have been due her late husband, he having died on 9th July. (See Board Minutes of 5th August)..... 75 00
3 24	" 27..	Wulff & Co., amount of poundage received on 2nd August from Pilot Norbert Arcand, the same amount having been called for by the Custom House and paid in on 26th August by Wulff & Co..... 1 85
382 91		<i>Forward</i> \$ 3,099 47
367 59		

Dr. ALEXANDER ROBERTSON, TREASURER, IN ACCOUNT

1890		
Nov. 7	Forward.....	\$ 6,667 59
	To received from the Canada Shipping Company	
	poundage short paid when clearing the following	
	vessels, namely :—	
	“ Lake Winnipeg”.....	.02
	“ Lake Ontario”.....	.16
	“ Lake Superior”.....	.06
	“ Lake Huron”.....	.06
	—	30
	“ 17.. Poundage from Joseph Toupin, pilot on S. S. “ Bona-	
	vista,” from Quebec to Sorel, on 8th September...	1 64
	“ 29.. Trinity dues for November from Collector H. M.	
	Customs, Montreal.....	306 84
Dec. 2..	Trinity dues from Collector H. M. Customs, Sorel,	
	collected at that port from 24th April to 31st	
	October, as per detailed statement, namely \$100.81	
	Less cost of bank draft on Montreal.....	.26
	—	100 55
“ 10..	Trinity dues from Collector H. M. Customs, Three	
	Rivers, collected at that port from 28th May to 18th	
	October, as per detailed statement.....	34 01
“ 13..	Poundage from Messrs. Price Bros. & Co., Quebec,	
	per Montreal Pilotage Agent there, on the follow-	
	ing vessels :—	
	Bark “ Skibladner,” Quebec to Batiscan.....	\$.65
	“ “ Progress,” “ “	1.12
	“ “ Dilbur,” “ “ .....	.97
	“ “ Comorin,” “ “ and	
	from Batiscan to Quebec.....	2.62
	—	5 36
“ 31..	Trinity dues, balance for season from Collector H. M.	
	Customs, Montreal.....	10
“ “	Interest from City and District Savings Bank on	
	monies at deposit during the year at 3 per cent.	
	per annum.....	62 58
		—————
	Forward... ..	\$ 7,178 97

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WITH THE DECAYED PILOT FUND.—Continued.

Cr.

6,667 59

1890

Forward..... \$ 3,099 47

By pensions paid to the following for three months
ended 31st October :—

30

Oct.	31..	Widow Hubert Lemay, Montreal.....	37 33
Nov.	3..	“ Olivier Abelle, do	37 33
“	4	“ Edouard Naud, Sorel.....	32 00
“	5..	Old Pilot Joseph Leveille, Montreal	75 00
“	“	Widow Zépherin Boudreau, Three Rivers.....	37 33
“	“	“ Edouard Boudreau, do	37 33
“	“	“ Isaie Beaudry, Sorel.....	37 33
“	“	“ L. David Bouillé, Deschambault.....	29 33
“	“	“ Narcisse Bouillé (née Marie Anne Arcand), Deschambault.....	37 33
“	“	“ Narcisse Bouillé (née Hortense Proulx), Deschambault	37 33
“	“	“ Sévère Bellisle, Deschambault.....	37 33
“	“	“ Placide Gaillardet, St. Gregoire.....	37 33
“	“	Reverend Chs. Z. Garceau, St. Pierre les Becquets being widow Hector Hamelin's pension, she hav- ing died on 12th October.....	37 33
“	“	Widow David Mathieu, Grondines.....	32 00
“	“	“ Zepherin Mayrand, Conireceur.....	37 33
“	“	“ Eusébe Toupin, Three Rivers.....	32 00
“	“	“ Jos. L. Dessureau, Sorel.....	37 33
“	“	Old Pilot J. B. Dorval, Cap de la Madeline.....	75 00
“	“	Widow Adolphe Lisé, Batiscan, pension which would have been due old pilot A. Lisé, he having died on 13th October.....	75 00
“	“	“ Old Pilot Onesime Naud, Sorel.....	75 00
“	“	“ George Raymond, Deschambault.....	75 00
“	7	Postage on pensions remitted 6th August and 5th November by registered letter, namely, 32 in all, at 8c each.....	2 56
“	10..	Widow Olivier Raymond, Montreal, three months' pension to 1st November.....	37 33
Dec.	31..	Harbour Commissioners of Montreal, for two Montreal Harbour debentures, series “G,” of \$1,000 each, at 101 net (ex coupon due 5th Jan- uary, 1891).....	2,020 00

Forward..... \$ 6,107 65

62 58

78 97

Dr. ALEXANDER ROBERTSON, TREASURER, IN ACCOUNT

1890	Forward	\$ 7,178 97
		<u>\$ 7,178 97</u>

STATEMENT OF THE FUND.

MONTREAL HARBOUR DEBENTURES.

Nos.	SERIES.	DUE	INTEREST	
154-156	M	5th Jan. 1894	6½ p.c.= 3 × \$1,000....	\$ 3,000 00
36-43	N	5th July 1894	6½ p.c.= 8 × 2,000....	16,000 00
81	P	5th " 1896	6 p.c.= 1 × 2,000....	2,000 00
20 and 102	R	5th " 1906	6 p.c.= 2 × 500....	1,000 00
117-119	R	5th " 1906	6 p.c.= 3 × 1,000....	3,000 00
21 and 45-49	D	5th " 1915	5 p.c.= 6 × 1,000....	6,000 00
164-172	F	5th " 1917	4 p.c.= 9 × 1,000....	9,000 00
189-190	G	5th " 1918	4 p.c.= 2 × 1,000..	2,000 00
			{ without current coupon for six months in- terest, due on 5th January, 1891..... }	
165	City of Montreal Consolidated Fund, (Due 1st July, 1910) interest 5 p.c. 50 × \$100.00.....			\$ 5,000 00
	Cash in Montreal City and District Savings Bank at 3 p.c. interest.....			\$2,432.56
	Less cheque on the account dated 5th January, 1891, in the hands of the Harbour Commissioners of Montreal, being balance of payment for two " G " Bonds.....			\$1,361.24
				<u>\$ 1,071 32</u>
	Total			\$48,071 32

ALEXANDER ROBERTSON,
TREASURER,
MONTREAL, 31st December, 1890. }

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WITH THE DECAYED PILOT FUND.—*Continued.*

Cr.

1891		
Dec.	<i>Forward</i>	\$6,107 65
" 31..	By balance to January, 1891	1,071 32
		<u>\$ 7,178 97</u>

We hereby certify that we have examined the foregoing entries for the year 1890 and found them to agree with vouchers on file; also that Debentures and Certificates covering the sum of \$48,071.32, as described in Statement opposite, have been this day submitted for our inspection.

(Signed)

RIDDELL & COMMON,

Auditors.

Montreal, 2nd January, 1891.

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REPORT
OF THE
HARBOUR MASTER OF THE PORT OF MONTREAL,
FOR THE YEAR 1890.

CAPTAIN THOMAS HOWARD, *Harbour Master.*

HARBOUR COMMISSIONERS OF MONTREAL,
HARBOUR MASTER'S OFFICE,
MONTREAL, January 5th, 1891.

ALEXANDER ROBERTSON, Esq.,
Secretary,

Harbour Commissioners of Montreal.

SIR:—

For the information of the Board of Harbour Commissioners I beg to submit the following as my Annual Report for the year 1890, with comparative statements showing the number, tonnage, classification, nationality, greatest number of vessels in port at one time, number and tonnage of sea-going vessels consigned to the different agents, with statements showing the number and tonnage of inland vessels, and the greatest number in port at one time during the past ten years.

Seven hundred and forty-six (746) sea-going vessels arrived in port during the season, of the aggregate tonnage of 930,332 tons; of this tonnage 69,816 passed into the canal, showing an increase of 51 vessels and 107,167 tons

in tonnage, as compared with the year 1889. Of these vessels 546 were built of iron of an aggregate tonnage of 891,057 tons, and 200 of wood of an aggregate tonnage of 39,275 tons. Of inland vessels there arrived in port 5,162, of an aggregate tonnage of 966,959 tons, showing a decrease of 685 vessels, and in tonnage 102,741 tons, and a total of 5,908 vessels of all classes, and 1,897,291 tons in tonnage, showing an increase of tonnage of vessels of all classes of 5,585 tons.

Some of the principal items of exports and imports during the season were:—

EXPORTS.

Lumber—There were shipped to the United Kingdom 175,444,161 feet. To South America, 3,862,699 feet; total shipments, 179,306,860 feet, showing an increase of 42,539,596 feet over the previous year. Of this number 161,147,836 feet were shipped from the harbour, and 18,159,024 feet from the canal. There is a decrease of 19,157,964 feet in quantity shipped to South America, which is due to political troubles in that country.

Phosphate—There were shipped 23,488 tons, showing an increase of 1,664 tons as compared with 1889.

Grain—There were shipped 2,171,817 bushels of wheat, 4,805,035 of corn, 1,382,224 of peas, 210,000 of oats, 240,863 of rye, making a total of 8,809,939 bushels, and a decrease of 1,033,236 bushels from the previous year.

Flour—There were shipped in bags and barrels, equal to 447,031 barrels, showing a decrease of 72,544 barrels.

Cheese—There were shipped 1,369,368 boxes, showing an increase of 224,972 boxes.

Apples—There were shipped 160,594 barrels, showing an increase of 22,574 barrels over the previous year.

Cattle and Sheep.—Cattle shipped, 119,578 head, and 43,135 sheep, showing an increase of 34,525 head of cattle, and a decrease of 15,848 sheep.

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IMPORTS.

Coal.—We had from Great Britain 16,879 tons, showing a decrease of 15,402 tons; from the United States, 181,611 tons, showing a decrease of 15,302 tons, making a total of 198,490 tons. From the Maritime Provinces, 455,450 tons, showing an increase of 105,165 tons, and a grand total of 653,940 tons, and an increase over the previous year of 72,626 tons. Of this coal 552,100 tons were discharged in the harbour, and 100,207 tons in the canal.

Cement.—We had 110,811 barrels, showing a decrease of 5,101 barrels from the previous year.

Scrap Iron.—We had discharged in the harbour 28,000 tons, showing an increase of 5,000 tons over the previous year.

WHARF ACCOMMODATION.

During the season the wharves were kept in good repair. The extension of the wharves at Hochelaga was well pushed forward, considering the detention by high water in the spring. On September 29th, the barque "Karnack," with a cargo of sugar for the St. Lawrence Sugar Refinery, was berthed at the new pier opposite their refinery at Hochelaga. This was the first sea-going vessel discharged there, and was followed by a number of steam and sailing ships for the same company.

The increased accommodation at Hochelaga will be of great advantage to merchants and agents having vessels to discharge and load there.

I would recommend that the harbour tracks used by the Grand Trunk Railway and Canadian Pacific Railway be extended as soon as possible, so as to remove freight to and from vessels that cannot get berths in the west end of the harbour.

Yours respectfully,

THOMAS HOWARD,

Harbour Master.

WEATHER REPORT.

January.—1st, 8 a.m., mild, temp. 32; 3 p.m., southwest wind; 9 p.m., rain, temp. 40; 2nd, temp. 46, rain this morning, snow all gone, bad roads; 3rd, fine clear morning, northwest wind, temp. 24 above, river clear of ice; 4th, west wind, temp. 14 above zero; 5th, 8 a.m., snow-storm, temp. 17 above, west wind; 6th, northeast wind, temp. 20 above; 1 p.m., rain and snow; 7th, fine morning, temp. 12 above, west wind, sleighing good; 8th, temp. 18 above, east wind, nasty morning; 9th, fine and cold northwest wind, temp. 6 below; 10th, northeast wind, temp. 20 below zero, river blocked with ice; 11th, east wind, temp. 10 below, water rising fast; 12th, temp. 9 above; 10 p.m., rain, east wind; 13th, 8 a.m., temp. 42 above, rainstorm, at 2 p.m., blowing a gale; 14th, fine morning west wind, temp. 10 above; 15th, northeast wind, temp. 28 above, snowing; 16th, east wind, snowing, temp. 25 above; 17th, north wind, temp. 8 below, fine morning, good sleighing; 18th, fine morning, north wind, temp. 2 above; 19th, east wind, temp. 8 above; 20th, east wind, temp. 24 above; 21st, west wind, temp. 12 above, fine weather, ice looks stationary; 22nd, west wind, temp. 7 above, channel open this morning; 23rd, fine morning, east wind, temp. 4 above; 24th, fine morning, west wind, temp. 5 above, crossing from Longueuil with teams to Hudon Cotton factory; 25th, southwest wind, temp. 20 above, crossing on foot opposite the city, river open from Nun's Island to Lachine Rapids; 26th, west wind, temp. 28 above; water high; 2 p.m., 38 feet 9 inches; 27th, east wind, temp. 15 above, channel open opposite St. Helen's Island; 28th, west wind, temp. 2 below, making road to St. Lamberts; 29th, temp. 30 above, southwest wind, fine weather; 30th, east wind, temp. 10 above, dark day; 31st, very mild, south wind, 32 above.

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February.—1st, fine morning, west wind, temp. 20 above; 2nd, temp. 2 above, northeast wind; 3rd, rain this morning, southwest wind, temp. 35 above. 4th, fine morning, temp. 10 above, west wind, crossing from St. Lamberts on lower road: 5th, rain last night, temp. 7 a.m., 45 above, west wind, sleighing bad and ice bad; 6th, fine morning, north wind, temp. 4 above; 7th, 6 above, west wind, good crossing on lower road to St. Lamberts; 8th, snowstorm last night and this morning, east wind, temp. 28 above; 9th, temp. 10 above, west wind; 10th, northeast wind, temp. 4 above; 11th, fine morning, northeast wind, temp. 10 below during the night; 12th, snowstorm, northwest wind; 13th, mild, temp. 30 above, west wind; 14th, very mild, temp. 36 above, northwest wind, snow and rain all afternoon; 15th, fine morning, west wind, temp. 29 above; 16th, west wind, temp. 2 above; 17th, fine, east wind, temp. 4 below, good sleighing; 18th, east wind, blowing fresh, temp. 10 above; 19th, fine day, east wind, temp. 8 above; 20th, temp. 17 above, east wind; 21st, northwest wind, temp. 5 above, sleighing good; 22nd, fine weather, northwest wind, temp. 3 above; 23rd, temp. 4 above, fine day; 24th, mild, southwest wind, temp. 35 above; 25th, dark morning, northwest wind, temp. 37 above; 25th, temp. 40 above, east wind; 7 p.m., rain; 27th, mild day, temp. 35, west wind; 28th, dreadful day, rain and wind, temp. 38, southwest wind.

March.—1st, delightful day, west wind, temp 25 above; 2nd, fine weather, west wind, temp. 30 above; 3rd, fine and sunshine, temp. 15 above; 4th, west wind, temp. 14 above, fine sunshine; 5th, fine day, temp. 10 above, west wind; 6th, temp. zero, west wind; 7th, temp. 2 above, northwest wind; 8th, temp. 17 above, west wind; 9th, fine weather, 18 above, west wind; 10th, temp. 20 above, west wind; 11th, south wind, temp. 37 above; 12th dark

morning, temp. 45 above, southwest wind, rain all night and this morning; 13th, dark day, rain, temp. 41; 14th, temp. 40, south wind, crossing on all roads to city stopped; 15th, northwest wind, temp. 33; 16th, cold west wind, temp. 30; 17th, temp. 15 above, northwest wind; 18th, north wind, temp. 29 above; 19th, temp. 20 above, southwest wind; 20th, fine but cold, temp. 25 above; 21st, snow and rain, temp. 38, south wind; 22nd, northwest wind, temp. 38, fine morning; 23rd, northwest wind, temp. 30; 24th, temp. 22, northwest wind; 25th, fine day, temp. 30, southeast wind; 26th, temp. 40, northwest wind; 27th, west wind, temp. 35; 28th, temp. 27, snowstorm all afternoon and night; 29th, snowstorm continues, blowing a gale, temp. 25; 30th, fine day, west wind, temp. 27; 31st, temp. 27, northwest wind.

April.—1st, temp. 30, fine day; 2nd, temp. 28, west wind, fine weather; 3rd, fine morning, west wind, temp. 28; 4th, northwest wind, rain, temp. 44; 5th, cold morning, temp. 27, northeast wind; 6th, temp. 37; east wind; 7th, temp. 34, fine weather; 8th, northeast wind, temp. 36; 9th, dark morning, south wind, temp. 40; 10th, temp. 40, rain storm last night, river all clear of ice in harbour, channel open to Longue Pointe; 11th, temp. 35, about $2\frac{1}{2}$ feet water on wharves, very little ice; 12th, fine morning, temp. 45, west wind; 13th, temp. 50, west wind; 14th, temp. 47, schooner "Eugenie" arrived at 10 a.m., from Boucherville, first arrival; 15th, fine weather, temp. 45, north wind; 6 p.m., steamers "Longueuil" and "Hochelega" arrived from Boucherville, and two tugs from Sorel; 16th, temp. 46, fine weather, buoys being placed in river to Sorel; 17th, dark weather, northeast wind, temp. 42; 18th, temp. 35, northwest wind; 19th, fine weather, temp. 45, north wind; 20th, north wind, temp. 60; 21st, west wind, temp. 45; 22nd, east wind, temp.

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50, fine morning, raft seen this morning came from Garden Island; 23rd, west wind, Lachine canal open for navigation, temp. 50; 24th, temp. 40; northeast wind, ice reported passing Quebec; 25th, east wind, temp. 40, steamer "Filgate" arrived this morning down Lachine Rapids, navigation open to Quebec; 26th, east wind, temp. 40; 27th, snow last night, rain this morning, temp. 40, steamer "Miramichi" arrived from Quebec; 28th, fine weather, east wind, temp. 40; 29th, fine morning, south west wind, temp. 45; 30th, temp. 45, southwest wind, SS. "Oregon" arrived at 9 a.m., being the first arrival from sea this spring.

May.—1st, temp. 48, northwest wind, fine morning; 2nd, west wind, frost last night, 8 a.m., temp. 38; 3rd, temp. 50, west wind; 4th, northeast wind, temp. 40, rain all day; 5th, rain all night and this morning, northeast wind; 6th, rain continues, west wind, temp. 50; 7th, west wind, temp. 50, fine morning; 8th, northwest wind, temp. 51, fine weather; 9th, temp. 48, dark day, south wind; 10th, fine morning, rain all last night, east wind, temp. 50; 11th, fine day, temp. 60, west wind; 12th, east wind, temp. 60; 13th, fine morning, west wind, temp. 50; 14th, dark morning, northwest wind, temp. 60; 15th, south wind, temp. 60, fine day; 16th, temp. 50, west wind, fine morning; 17th, south wind, temp. 55; 18th, temp. 60, east wind; 19th, southwest wind, rain this morning; 20th, rain all night and this morning, temp. 54. 21st, fine and sunshine, temp. 50, west wind; 22nd, temp. 60, west wind; 23rd, southwest wind, temp. 60, fine day; 24th, east wind, temp. 60; 25th, south wind, blowing a gale, temp. 64; 26th, temp. 60; southwest wind; 27th, rain last night, dark morning, northwest wind temp. 60; 28th, temp. 55, rain last night, northeast wind; 29th, fine morning, east wind, temp. 60; 30th, temp. 60, east wind, fine day; 31st fine morning, east wind, temp. 60.

June.—1st, temp. 75, west wind, fine day; 2nd, northwest wind, temp. 8 a.m., 55; 3rd, temp. 60, northwest wind; 4th, rain, east wind, temp. 55; 5th, dark morning, east wind, temp. 60, rain; 6th, northwest wind, temp. 70, fine day; 7th, fine morning, west wind, temp. 65; 8th, fine but cold northwest wind, temp. 55. 9th, temp. 58, east wind; 10th, southwest wind, temp. 60; 11th, temp. 70, west wind; 12th, rain this morning, temp. 60, south wind; 13th, rain last night and this morning, temp. 55; 14th, rain continues, temp. 60; 15th, fine day, south wind, temp. 70; 16th, dark morning, south wind, temp. 65; 17th, fine day, south wind, temp. 75; 18th, fine morning, west wind, temp. 75; 19th, fine, much colder, temp. 65, northeast wind; 20th, temp. 70, northwest wind; 21st, fine morning, temp. 70, west wind; 22nd, northwest wind, temp. 70, fine day; 23rd, south-west wind, temp. 75; 24th, temp. 80, west wind; 25th, northeast wind, rain storm last night, temp. 75; 26th, fine morning, east wind, temp. 75. 27th, temp. 70, northeast wind; 28th, temp. 75, east wind, fine day; 29th, fine day, temp. 80; 30th, delightful day, temp. 80, west wind.

July.—1st, temp. 80, southwest wind, at 2 p.m., temp. 90; 2nd, temp. 78, fine weather, southwest wind; 3rd, rain this morning, temp. 75, south wind; 4th, west wind, temp. 75; 5th, northwest wind, temp. 73; 6th, temp. 70, west wind; 7th, rain this morning, temp. 70; 8th, northwest wind; temp. 80; 9th, north wind, temp. at 8 a.m., 60; 10th, cold last night, temp. 57; 11th, temp. 60; 12th, west wind, temp. 70; 13th, temp. 82, west wind; 14th, south wind, temp. 80; 15th, thunderstorm, this morning, temp. 75; 16th, very warm, temp. 85, west wind; 17th, temp. 75, southwest wind; 18th, temp. 65, northwest wind; 19th, rain this morning, temp. 65; 20th, west wind, temp. 65; 21st, temp. 60, northwest wind; 22nd, temp. 63, southwest wind; 23rd, west wind, temp. 70; 24th,

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temp. 65, south wind ; 25th, temp. 70, south wind ; 26th, rain this morning, temp. 75 ; 27th, temp. 75, west wind ; 28th, temp. 80 ; south wind ; 29th, temp. 80, south wind ; 30th, temp. 75, west wind ; 31st, west wind, temp. 80.

August.—1st, fine weather, temp. 75, west wind ; 2nd, southwest wind, temp. 87 ; 3rd, rain storm, temp. 88, west wind ; 4th, southwest wind, temp. 85 ; 5th, temp. 85, rain all day, southwest wind ; 6th, fine, temp. 75, west wind ; 7th, northwest wind, temp. 75 ; 8th, temp. 75, west wind ; 9th, temp. 80, south west wind ; 10th, northeast wind, temp. 68. 11th, temp. 63, northeast wind ; 12th, temp. 70, northeast wind ; 13th, temp. 75, northwest wind ; 14th, temp. 80, south wind ; 15th, temp. 75, northeast wind ; 16th, temp. 60, northeast wind ; 17th, rain all day, temp. 70, west wind ; 18th, temp. 58, northeast wind, 19th, temp. 65, 4 p.m., rain storm, north wind ; 20th, temp. 60, north wind ; 21st, northwest wind, temp. 65, rain all afternoon ; 22nd, temp. 60, west wind ; 23rd, temp. 55, 9 a.m., rain storm, easterly wind ; 24th, rain all day, temp. 53, east wind ; 25th, temp. 53, northwest wind ; 26th, west wind, temp. 65 ; 27th, rain this morning, southeast wind, temp. 68 ; 28th, temp. 65, northwest wind ; 29th, fine morning, north wind, temp. 65 ; 30th, rain this morning, south wind, temp. 65 ; 31st, west wind, temp. 65, rain.

September.—1st, fine and clear, temp. 60, southwest wind ; 2nd, dark morning, temp. 64, southwest wind ; 3rd, fine morning, temp. 65, northwest wind ; 4th, temp. 76, southwest wind ; 5th, temp. 70, west wind ; 6th, temp. 75, southwest wind ; 7th, temp. 80, southwest wind ; 8th, southwest wind, temp. 75, rain storm ; 9th, east wind, temp. 60 ; at 2 p.m., H.M.S. "Canada," Capt. Dowding, with Admiral Watson on board, accompanied by H.M.S. "Thrush," Captain His Royal Highness Prince George of Wales, arrived in port and were berthed at Victoria

Pier. 10th, east wind, cold morning, temp. 60; 11th, east wind, temp. 60 overcast; 12th, rain last night, temp. 60; 13th, southwest wind; H.M.S. "Canada" and "Thrush" left at 6 a.m. for Quebec, raining; 14th, west wind, temp. 65; 15th, temp. 58, west wind; 16th, east wind, temp. 60; 17th, cold east wind, temp. 59; 18th, temp. 60, west wind. 19th, temp. 63, southwest wind; 20th, temp. 59, northwest wind; 21st, temp. 55, west wind; 22nd, temp. 55, northwest wind; 23rd, northwest wind, temp. 54; 24th, temp. 53, northwest wind; 25th, temp. 45, northwest wind; 26th, southwest wind, temp. 60; 27th, northeast wind, temp. 47; 28th, temp. 50, northeast wind; 29th, northeast wind; temp. 50; 30th, west wind, temp. 55.

October.—1st, temp. 60, northwest wind; 2nd, west wind, temp. 60; 3rd, rain this morning, temp. 60, southwest wind; 4th, temp. 60, rain this morning; 5th, temp. 55, west wind; 6th, temp. 47, northeast wind; 7th, cold east wind, temp. 42; 8th, west wind, rain last night, temp. 55; 9th, east wind, temp. 47; 10th, southwest wind, temp. 47. 11th, northwest wind, temp. 55; 12th, temp. 55, north wind; 13th, northeast wind, frost last night; 14th, temp. 47, rain this morning; 15th, west wind, temp. 47, fine day; 16th, southwest wind, temp. 56; 17th, rain this morning, temp. 55, south wind. 18th, east wind, temp. 55; 19th, easterly wind, temp. 50; 20th, temp. 47, east wind; 21st, frost last night, east wind; 22nd, northeast wind, temp. 45, frost last night; 23rd, temp. 44, northeast wind; 24th, east wind, temp. 44; 25th, east wind, temp. 44; 26th, temp. 50, east wind; 27th, east wind, temp. 50; 28th, temp. 44, west wind; 29th, temp. 38, east wind; 30th, northwest wind, rain last night, temp. this morning, 42; 31st, temp. 44, southwest wind.

November.—1st, temp. 38, west wind; 2nd, rain, temp.

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42, west wind ; 3rd, northwest wind, temp. 38 ; 4th, fine frosty morning, temp. 28, west wind ; 5th, northwest wind, temp. 38 ; 6th, east wind, temp. 44 ; 7th, temp. 39, east wind ; 8th, temp. 55, northwest wind ; 9th, north-east wind, rain, temp. 50 ; 10th, northwest wind, temp. 32 ; 11th, east wind, temp. 26, fine morning ; 12th, temp. 27, west wind ; 13th, southwest wind, temp. 40 ; 14th, west wind, temp. 45 ; 15th, temp. 32, east wind ; 16th, west wind, temp. 38 ; 17th, southwest wind, temp. 38 ; 18th, snow last night, temp. 38, west wind ; 19th, rain this morning, west wind, temp. 45 ; 20th, fine and cold west wind, temp. 28 ; 21st, temp. 27, northwest wind ; 22nd, temp. 37, west wind ; 23rd, temp. 24, fine and clear ; 24th, temp. 24, SS. "Brazilian" left port this morning at 7 a.m., being the last sea-going vessel for sea this season ; 25th, rain, temp. 40, southwest wind ; 26th, northwest wind, temp. 23 ; 27th, temp. 15, north wind ; 28th, north wind, temp. 16 ; 29th, temp. 30, west wind ; 30th, mild, west wind, temp. 40 ; steamer "Longueuil" gone to winter quarters;

December.—1st, northwest wind, temp. 5 ; 2nd, northwest wind, temp. 7 a.m., 12 below zero ; 3rd, east wind, temp. 5 below, ice making in harbour, 2 p.m., snowstorm, steamer "Laprairie" gone to winter quarters, navigation closed ; 4th, snowstorm all night and this morning, northwest wind, blowing a gale ; 5th, east wind, temp. 15 above, sleighing good ; 6th, temp. 4 below zero, water rising ; 7th, west wind, temp. 15 below ; 8th, northwest wind, temp. 5 below ; 9th, temp. 9 above, west wind ; 10th, temp. 30 above, southwest wind, water level with docks ; 11th, temp. 25 above, west wind ; 12th, north wind, temp. 12 above ; 13th, temp. 7 a.m. zero, northwest wind ; 14th, temp. 12 above, west wind ; 15th, temp. 28 above, west wind ; 16th, temp. 12 above, fine weather ; 17th, temp. 10 above, northwest wind ; 18th, temp. 20 above,

northwest wind ; 19th, temp. 4 above, northwest wind, ice looks stationary and very level, hardly any shove ; 20th, fine morning, southwest wind, temp. 2 below, ice shoved at 10 a.m. ; 21st, temp. 30 above, snow and rain, east wind ; 22nd, fine clear morning, temp. 16 above, northwest wind, water 33 feet ; 23rd, temp. 28 above, shove in afternoon, water 34 feet ; 24th, west wind, temp. 6 above, water 33 feet 3 inches ; 25th, temp. 6 below, west wind ; 26th, east wind, 10 below zero, crossing on ice at Longueuil ; 27th, snow this morning, east wind, temp. 12 below zero ; 28th, northwest wind, temp. 6 below ; 29th, temp. zero, northwest wind, road making to St. Lamberts : 30th, northwest wind, temp. 12 below, sleighs crossing to St. Lamberts ; 31st, northwest wind, temp. 14 below zero, good crossing to St. Lamberts and Longueuil.

The month throughout was very cold, not one day's thaw, and eleven days in the month the thermometer was from zero to 16 below zero.

THOMAS HOWARD,

Harbour Master.

PORT OF MONTREAL.

Statement showing the Nationality and Tonnage of Sea-going Vessels that arrived in Port during the Season of 1890, that were navigated by 22,663 Seamen.

Nationality.	Number of Vessels.	Tonnage.
British	697	878,481
Norwegian	24	18,187
German.....	20	25,713
French	2	3,520
Spanish.	2	2,426
American	1	2,005
Total	746	930,332

THOMAS HOWARD,
Harbour Master.

PORT OF MONTREAL.

Comparative Statement, showing the dates of the Opening and Closing of Navigation, first arrival from Sea, and the last Departure for Sea, the past ten years.

YEARS.	Opening of Navigation.	Closing of Navigation.	First Arrival from Sea.	Last Departure for Sea.
1881.....	April 21.	Jan. 2, '82.	April 29.	Nov. 23.
1882.....	" 11.	Dec. 9	May 6.	" 21.
1883.....	" 27.	" 16.	" 5.	" 20.
1884.....	" 22.	" 18.	" 2.	" 20.
1885.....	May 5.	" 7.	" 8.	" 20.
1886.....	April 24.	" 4.	April 30.	" 25.
1887.....	May 1.	" 23.	May 3.	" 28.
1888.....	April 29	" 14.	" 4.	" 22.
1889.....	" 14.	" 29.	April 27.	" 23.
1890.....	" 14.	" 3.	" 30.	" 24.

THOMAS HOWARD,
Harbour Master.

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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.
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.
1885.....	5,003	724,975	142..... Oct. 1.
1886.....	5,521	309,819	178..... Aug. 25.
1887.....	5,367	791,452	189..... May 31.
1888.....	5,500	863,014	163..... Aug. 14.
1889.....	5,847	1,069,709	187..... Aug 15.
1890.....	5,162	966,959	167..... Oct. 20.

THOMAS HOWARD,
Harbour Master

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.
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
1885.....	142	117,436	.....	.....	18	11,997	.....	.....	10	2,307	47	4,814	217	133,554
1886.....	175	150,784	.....	.....	4	2,535	3	794	2	466	41	2,902	225	157,481
1887.....	224	194,023	2	2,389	11	8,676	1	313	2	342	36	3,139	276	208,882
1888.....	213	195,598	1	1,199	4	3,079	.....	.....	3	701	35	3,375	256	203,952
1889.....	184	173,076	.....	.....	1	998	.....	.....	3	441	52	4,668	240	179,183
1890.....	252	235,722	.....	.....	.....	.....	.....	.....	1	170	42	3,714	295	239,606

THOMAS HOWARD, Harbour Master.

PORT OF MONTREAL.
 COMPARATIVE STATEMENT, showing the Number, Tonnage and Classification of Sea-going Vessels that arrived

PORT OF MONTREAL.

COMPARATIVE STATEMENT, showing the Number, Tonnage and Classification of Sea-going Vessels that arrived in Port the past ten years, with the dates of the greatest number in Port at one time, each year.

Years.	Steamships.	Tonnage.	Ships.	Tonnage.	Barkes.	Tonnage.	Brigs.	Tonnage.	Brigantines.	Tonnage.	Schooners.	Tonnage.	Total number of vessels.	Total tonnage.	Greatest Number in Port at one time.
1881..	321	446,457	5	4,640	104	60,617	9	2,377	30	6,152	100	11,686	569	531,929	59..... Aug. 14
1882..	379	475,679	4	4,330	93	51,195	10	2,702	37	7,182	125	13,604	648	554,692	53..... " 21
1883..	464	605,805	3	3,356	70	38,547	7	2,417	15	3,012	101	11,126	660	664,263	38..... June 27
1884..	444	585,397	2	2,218	83	49,048	3	1,036	13	2,996	81	8,679	626	649,374	44..... Aug. 13
1885..	441	619,647	2	2,792	76	45,560	1	338	23	6,141	86	9,376	629	683,854	43..... July 15
1886..	532	736,648	11	13,475	68	47,233	10	3,061	7	1,850	75	7,432	703	809,699	44..... Aug. 18
1887..	600	807,471	7	8,684	68	43,275	2	1,118	7	2,031	82	8,194	767	870,773	37..... July 21
1888..	532	742,276	7	9,634	32	20,218	.....	.....	10	2,631	74	7,714	655	782,473	36..... June 27
1889..	522	763,783	8	11,923	49	33,982	4	1,239	11	2,356	101	9,882	695	823,165	39..... Aug. 14
1890..	624	889,189	9	13,127	33	19,442	2	590	8	1,333	70	6,671	746	930,332	37..... Sept. 3

THOMAS HOWARD, Harbour Master.

PORT OF MONTREAL.
 STATEMENT SHOWING THE NUMBER AND TONNAGE OF OCEAN STEAMERS and SAILING VESSELS, also of INLAND VESSELS, that
 ARRIVED in the PORT of MONTREAL, from 1850 to 1890.

Year.	Ocean Going Steamships.	Tonnage of Ocean Going Steamships.	Ocean Going Sailing Vessels.	Tonnage of Ocean Going Sailing Vessels.	Total Tonnage of Steamships and Sailing Vessels.	Total No. of Steam and Sailing Vessels.	Inland Vessels.	Tonnage of Inland Vessels.	Grand Total of Ocean and Inland Tonnage.
1850	.....	.....	222	46,867	46,867	222	.....	.....	46,867
1851	.....	.....	275	58,605	58,605	175	.....	.....	58,605
1852	.....	.....	185	45,012	45,012	185	.....	.....	45,012
1853	.....	.....	248	57,752	59,703	252	.....	.....	59,703
1854	4	1,951	252	65,365	70,910	258	.....	.....	394,488
1855	6	5,545	197	48,154	48,154	197	4,251	323,578	360,155
1856	.....	.....	231	57,045	71,321	247	3,281	384,467	455,788
1857	16	14,276	218	60,199	67,740	227	3,311	429,532	497,272
1858	9	7,541	209	60,922	78,809	225	4,124	342,224	422,033
1859	16	17,887	195	50,956	94,660	230	4,198	459,065	553,725
1860	35	43,704	222	74,174	121,559	257	4,558	348,652	470,211
1861	32	47,385	534	210,495	261,793	574	5,247	530,234	792,017
1862	40	51,298	519	202,331	265,243	571	4,875	523,991	789,234
1863	52	62,912	450	152,762	209,222	504	4,697	534,740	743,962
1864	54	56,460	327	102,830	161,901	378	4,509	420,694	582,595
1865	61	59,071	285	74,928	152,943	358	4,771	626,550	779,493
1866	63	78,015	446	130,301	205,775	516	5,083	613,679	819,454
1867	70	75,474	358	111,854	199,053	464	5,248	744,477	943,530
1868	106	87,199	373	97,198	198,759	478	5,822	746,927	945,186
1869	105	101,566	440	141,898	259,863	557	5,866	721,324	981,187
1870	117	117,965	536	182,934	316,846	680	6,345	819,476	1,136,322
1871	144	133,912	522	204,794	351,721	664	6,878	824,787	1,176,508
1872	142	146,927	512	181,087	398,800	727	6,751	936,782	1,335,582
1873	215	217,713	460	167,241	412,478	702	6,751	933,462	1,345,934
1874	242	245,237	465	161,327	423,423	731	6,855	956,837	1,380,260
1875	266	262,096	.....	.....	.....	.....	.....	.....	.....
1876	256	255,435	386	130,677	386,112	642	6,178	811,410	1,197,525
1877	240	262,829	362	128,351	391,180	602	6,083	785,083	1,177,263
1878	247	240,219	266	136,649	376,859	513	6,338	847,978	1,224,837

1875	256	255,435	386	130,677	386,112	642	6,178	811,410	1,197,525
1876	240	262,829	362	128,351	391,180	602	6,083	785,083	1,177,263
1877	247	240,219	266	136,649	376,859	513	6,338	847,978	1,224,837

1875	256	255,435	386	130,677	386,112	642	6,178	811,410	1,197,525
1876	240	262,829	362	128,351	391,180	602	6,083	781,083	1,177,263
1877	247	240,219	266	136,640	376,859	513	6,338	847,978	1,224,837
1878	207	272,878	309	124,388	397,266	516	5,502	764,243	1,161,509
1879	289	367,463	323	139,506	506,969	612	5,698	817,243	1,324,212
1880	354	475,741	356	152,530	628,271	710	6,489	1,044,380	1,672,651
1881	321	446,457	248	85,472	531,929	569	6,030	949,380	1,481,309
1882	352	466,460	296	88,186	554,646	648	5,947	848,780	1,408,426
1883	464	605,805	196	58,458	664,263	660	5,477	764,721	1,428,984
1884	444	585,397	182	63,977	649,374	626	4,808	726,015	1,375,389
1885	441	619,647	188	64,207	683,854	629	5,003	724,975	1,408,829
1886	532	736,648	171	73,051	809,699	703	5,521	809,819	1,619,519
1887	600	807,471	167	63,302	870,773	767	5,367	791,452	1,662,225
1888	532	742,276	123	40,179	782,473	655	5,500	863,014	1,645,487
1889	522	763,783	173	59,382	823,165	695	5,847	1,069,709	1,892,874
1890	624	889,189	122	41,143	930,332	746	5,162	966,959	1,897,291

In the years 1850, 1851, 1852 and 1853, no Ocean-going Steamships arrived, 1853 being the first to witness such vessels; while for the years 1850-1853 inclusive, the figures for Inland Vessels cannot be given, owing to the records having been destroyed by a fire.

THOMAS HOWARD,
Harbour Master.

PORT OF MONTREAL.

Number and Tonnage of Sea-going Vessels consigned to the following Merchants, during the season of 1890:—

No.	NAME OF FIRM.	STEAM.	TONNAGE.	SAIL.	TONNAGE.	TOTAL. No. of Vessels	TOTAL TONNAGE.
1.	H. & A. Allan.....	77	180,297	.....	.....	77	180,297
2.	R. Reford & Co.....	72	121,469	.....	.....	72	121,469
3.	D. Torrance & Co.....	47	107,425	.....	.....	47	107,425
4.	Canada Shipping Co.....	30	73,657	.....	.....	30	73,657
5.	Kingman, Brown & Co..	64	64,652	.....	.....	64	64,652
6.	McLean, Kennedy & Co.	38	58,846	3	3,089	41	61,935
7.	Carbray, Routh & Co....	31	31,001	3	4,389	34	35,390
8.	Munderloh & Co.....	24	34,107	.....	.....	24	34,107
9.	J. G. Sidey.....	28	31,959	.....	.....	28	31,959
10.	J. & R. McLea.....	28	30,818	1	66	29	30,884
11.	Henry Dobell & Co.....	36	25,010	.....	.....	36	25,010
12.	Intercolonial Coal Co...	26	24,148	.....	.....	26	24,148
13.	H. Dobell & Co (canal)..	28	19,268	.....	.....	28	19,268
14.	F. C. Henshaw.....	16	16,790	.....	.....	16	16,790
15.	Carbray, Routh & Co. } (canal).....	11	9,983	1	1,500	12	11,483
16.	Anderson McKenzie.....	2	2,782	14	8,498	16	11,280
17.	J. G. Sidey canal).....	10	9,996	.....	.....	10	9,996
18.	Thos. Fraser & Co.....	20	7,860	11	828	31	8,688
19.	David Shaw.....	5	8,349	.....	.....	5	8,349
20.	Kingman, Brown & Co. } (canal).....	9	8,206	.....	.....	9	8,206
21.	J. Burstall & Co.....	5	6,845	.....	.....	5	6,845
22.	Anderson McKenzie } (canal).....	.....	.....	9	3,867	9	3,867
23.	Masters.....	2	2,092	10	1,683	12	3,775
24.	W. E. Boyd.....	.....	.....	3	3,230	3	3,230
25.	Imperial Government...	2	3,175	.....	.....	2	3,175
	Eighteen others.....	13	11,054	67	13,993	80	25,047
		624	889,189	122	41,143	746	930,332

THOMAS HOWARD,
Harbour Master.

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REPORT
ON THE
WORKS FOR THE IMPROVEMENT AND MAINTENANCE
OF THE
HARBOUR OF MONTREAL
FOR THE YEAR 1890,

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

HARBOUR COMMISSIONERS OF MONTREAL,
Chief Engineer's Office,
MONTREAL, February 7th, 1891.

ALEXANDER ROBERTSON, Esq.,
Secretary,
Harbour Commissioners of Montreal.

DEAR 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, 1890.

The following are the chief details of the work done :

NEW WORKS.

Sections 5 and 6 (Windmill Point).—A little rock dredging was done in spring for the immediate purpose of

obtaining stone to repair wharves, but in such a way as also to contribute toward the enlargement of the Basin. Expenditure, \$395.56.

Sections 39 and 40 (Hochelaga).—The full width of the wharf from Dezery street to 300 feet above was covered with new macadamizing stone.

Sections 41 and 42 (Hochelaga).—At the Hochelaga cotton mill work was resumed on the new wharf on the 22nd of July, which was as soon as the water had sufficiently lowered, and the crib work was extended 209 lineal feet down stream, making, with last year's work a length of 1,005 feet. An addition of 219 feet was made to the superstructure, making in all 670 feet of finished new wharf. The remaining 335 feet of crib work was built up to about three feet above ordinary low water so as to allow of its being continued at an early date next summer. The crib work and the space in rear were filled with dredgings to the extent of 70,379 cubic yards in order to form the wharf.

The foundation for the crib work put down in the past year, and for its further extension, was dredged out, as was also part of the main shoal in front of the new wharf. Quantity dredged, 24,345 cubic yards.

Section 44.—The timber culvert, 5 feet 6 inches high by 6 feet wide, inside, at the Ruisseau Migeon was continued towards shore 45 feet, to be there connected with the sewer built by the city during the past summer.

Sections 45 and 46 (Maisonneuve)—At Maisonneuve six cribs, aggregating 722 feet in length, were added to the new pier which, with those placed last year, make 1,265 feet of new crib work. On this the superstructure was raised to the full height for a length of 680 feet, viz., 100 feet along the shore wharf above the pier and 580 feet along the upper side of the pier itself. The remaining

585 feet of crib work was built up to about three feet above ordinary low water level, so that work may be resumed early next summer. The finished crib work and about 50 feet in breadth in rear were filled up to the full wharf height with dredgings and covered with macadamizing stone. The unfinished portions of the crib work were also filled and back-filled with dredgings to the height of the timber work. Total quantity of filling, 50,439 cubic yards.

The basin above the new pier was dredged to a width of 200 feet, with a depth, in the greater part of it, of $27\frac{1}{2}$ feet, and in the remainder of 25 feet, at low water. Below the pier also considerable dredging was done toward forming a basin for vessels. Quantity dredged, 162,213 cubic yards.

One berth of the new pier was ready for use on the 9th September, and on that day the first vessel, a coal barge, was berthed at it.

The aggregate expenditures on the new work at Sections 41 and 42, Hochelaga, and Sections 44 to 46 Maisonneuve, are :

For crib work	\$ 50,110 99
For back-filling and macadamizing.....	17,651 30
For dredging and derrick work.....	50,541 52
	<hr/>
Total.....	\$118,303 81

New crossings of block stone paving were laid across the wharves in different places, as follows :

One on Section 8, in line of Black's Bridge; one on Section 13, at foot of ramp leading to Port street; one at Brock street ramp; one at Voltigeurs street ramp; one at Monarque street ramp; one at Delorimier Avenue ramp; and one at Dezery street.

SHIP CHANNEL THROUGH THE HARBOUR.

The removal of the boulder shoals which somewhat obstructed the Channel in the Current St. Mary was continued with a stone lifter borrowed from the Department of Public Works. Work was commenced on the 19th of June and continued till September 20th, when the stone lifter was required by the Department and work was stopped. By this time all the more important shoals had been removed and the depth of water on them tested. Expenditure, \$2,737.34.

HARBOUR REPAIRS.

The water in the harbour rose at the breaking up of the ice last spring to 35 feet 1 inch on the lower lock sill of the Lachine Canal, which is three inches above the average of many years past. The ice moved off without seriously damaging any of the wharves and leaving no great quantity lodged upon them.

The total cost of maintenance and repairs for the year was \$56,380, which compares with the cost of previous years, as follows:

1875.....	\$16,499
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
1885.....	42,158
1886.....	64,989
1887.....	64,984
1888.....	49,520
1889.....	51,892
1890.....	56,380

The following are the principal items of repair in 1890 :

Section 6 (Windmill Point).—An ice breaker was put on the upper end of the crib work of Windmill Point wharf, consisting of new stringers, ties, and 4 in. planking.

Section 11 (Windmill Point).—The old planking and sleepers for a distance of 240 feet across the lower end of the wharf were taken up and the wharf repaired with new hemlock sleepers, top planking and face planking and new pine coping. Top planking reduced to 12 feet wide.

Sections 13 and 14 (Allan Line Berths).—About 700 feet of the middle railway track was taken up and moved farther from the northeast track, so as to admit freight wagons between the lines of cars on these two tracks. A part of the wharf, extending from the revetment wall to a distance beyond both tracks had the roadway renewed by the removal of the old material and replacing it with one foot of shale rock foundation and a covering of ten inches of new macadamising stone.

The crib work across the basin at the lower side of section 14 was repaired with four to five courses of pine face timber, new pine cross ties and sleepers and new top planking.

The roadway opposite this basin and across the approach to the Island wharf was also thoroughly repaired by removing worn material and replacing it with a foot of shale rock bedding covered by a foot of new macadamizing stone.

The latrine opposite Custom House Square being decayed was replaced by a new one on a new concrete foundation.

Section 15.—On the inshore side of the basin the remaining part of the original joists and planking on the pile work was, at the close of navigation, taken up for renewal. About two-thirds of the renewal was made when

a sudden rise of the river stopped the work, leaving it to be finished in the coming spring.

Section 20.—The lower inside corner of the Victoria Pier was badly damaged by the steamship "Oxenholme" and was repaired and altered in shape.

Sections 18 and 19.—From the Richelieu Pier to Victoria Pier the whole width of the wharf received a new shale rock road bed and about nine inches of new macadamizing stone.

The crib work across Bonsecours Basin was renewed with three courses of face timber, new cross ties, sleepers and longitudinal top planking.

Sections 23 to 27.—From the foot of Brock Street Ramp to the middle of section 27 new macadamising stone was put on from the front of the wharf back to the railway tracks, with new shale rock foundation under the macadam in rear of the small basin section 26.

The crib work across the small basin section 26, was repaired with four courses of new pine face timber, new cross ties, sleepers and longitudinal planking.

Sections 27 to 37.—Heavy repairs were made to the roadway in the early part of the summer.

In the Delorimier Avenue Sewer a washout of earth occurred at the junction of the masonry and timber work, beneath the railway track on the wharf. Repairs were made by consent of the City Surveyor, at the city's expense.

Two slips were cut in the wharf at section 32 to fit the gangways of the Boucherville Ferry steamer, at the expense of the Richelieu & Ontario Navigation Co., and were fitted with mooring and fender posts.

Fourteen new countersunk iron mooring posts with the necessary timber supports were put in sections 34 to 37, inclusive, instead of old oaks posts.

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Roadways—Macadamizing stone has been spread on the wharves as follows :—

Section.	No. of Toises.	Section.	No. of Toises.
8.....	14	21.....	36
11.....	17	22.....	60
13 & 14.....	119	23 & 24.....	302
15.....	40	25.....	168
16.....	45	26.....	132
17.....	39	28.....	11
18.....	29	29.....	2
19.....	87	32 & 33.....	7
20.....	54	39 & 40.....	16

Total toises spread for maintenance of roadways, as above, 1,178.

Several of the footpath crossings throughout the Harbour have been repaired and raised.

HARBOUR DREDGING PLANT AND DREDGING.

The Harbour dredging plant was composed of three spoon or dipper dredges, three derricks and two tugs, with coal barge, scows and a floating shop as detailed in the appended table. Besides these a stone-lifter and three dumping scows were borrowed from the Government Ship Channel fleet, for part of the summer.

Two dredges were wintered in Cantin's dry dock, Montreal; the other dredge, two derricks, one tug, the floating shop and two scows were wintered in the Lachine Canal near the dry dock; and one derrick, one tug, a coal barge and the remainder of the scows at the Boucherville Islands.

All repairs were made by the Commissioners' own men, the machinery work being mostly done in Mr. Cantin's machine shop, which was leased for the purpose.

Dipper dredge No. 4 was altered from a crane dredge to an Osgood boom dredge; swinging engines were added; wire ropes were substituted for chains for working the spuds, and large chains were put over the top of the for-

ward spuds for holding them down, instead of the ordinary pins; and the machinery was overhauled generally. The sides and stern of the hull were entirely rebuilt and much strengthened; the bow was nearly all renewed and also much strengthened; the deck was in great part renewed; the spud guides both fore and aft were renewed, and the framing connecting the forward spud guides was renewed and greatly strengthened. The alterations have been made for a working depth of 33 feet, and have added much to the digging rate and power of the dredge. Cost of alterations and rebuilding, \$9,196.

The other dredges and vessels received ordinary repairs.

Contracts for the main machinery and boiler for a new dipper dredge were awarded to the Bucyrus Steam Shovel and Dredge Company, of Bucyrus Ohio, and to Mr. George Brush, of Montreal, in May last. The building of the boat was done by the Commissioners' men in Montreal. It was commenced at the end of June, and was launched on the 18th of November, and the machinery is now being fitted in at the Island at St. Gabriel Locks.

In October the hull of the Government elevator dredge No. 3 was bought at auction at Sorel, and is now being fitted up as a floating shop, to take the place of the old floating shop, which has become very leaky and rotten.

A new bucket of $3\frac{1}{2}$ yards capacity, with Canan's patent door, was built during the latter part of the summer, mainly for use on No. 4 dredge.

Tug St. Louis, derrick No. 1 and the scows which wintered at Boucherville, were brought up to the harbour at different times between the 16th and 18th of April. The dredges and other derricks and vessels which were wintered in the canal all came out on 24th April, except dredge No. 4, which came out on May 12th. Dredge No.

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6 was got to work on 28th April, No. 7 on May 5th, and No. 4, which was detained by her alterations, commenced on May 24th. The stone lifter which was borrowed from Government, was brought up from Sorel on the 14th of June, and commenced work on the 19th of June.

The stone lifter stopped work and was returned to Sorel on September 20th. The dredges and derricks were stopped on 26th November, and sent to winter quarters in the Lachine canal on the 28th. Dredge No. 6, derrick No. 2 and the two tugs, all of which needed repairs, were laid up in Cantin's Dry Dock. Dredges 4 and 7, the new dredge No. 1, derricks Nos. 1 and 3, the floating shops and two scows were laid up alongside the Island above the St. Gabriel Bridge. The coal barge and the remaining scows were laid up in the Wellington Basin.

The number of days during which the spoon dredges were on duty, reckoning every day except Sundays, from commencing in spring to leaving off in fall, was 157 days for No. 4, 182 days for No. 6 and 176 days for No. 7, making an aggregate of 515 days for the season.

The nominal working time is ten hours per day, which gives a total of 5,150 hours service; but the actual dredging time, after deducting that lost for repairs, changing position, detention by vessels, short days in autumn, and all other causes, was reduced to 4,374 hours, or an average of 84.93 per cent. of the gross time of service.

The total outlay for working the Commissioners' own fleet, consisting of three spoon dredges, three unloading derricks, two screw tugs and the scows, was \$50,928.66, and this, as usual, represents the entire cost of working the plant and machinery, repairs, outfit, fuel, wages, salaries, insurance, and all other outlays, except interest on capital and depreciation of plant. It also includes the cost of altering and rebuilding dredge No. 4.

The cost of working the borrowed stone-lifter was \$2,745.76, making a total outlay of \$53,674.42.

The following are the comparative costs and quantities of dredging for 1890, and for previous years:—

YEARS.	CUBIC YARDS DREDGED.	TOTAL COST.	COST PER CUBIC YARD, CENTS.	REMARKS.
1875...	151,719	\$68,979	45	
1876...	156,082	55,462	35 $\frac{50}{100}$	
1877...	173,499	45,103	26	
1878...	211,731	48,748	23	
1879...	189,609	41,006	21 $\frac{63}{100}$	
1880...	186,430	46,914	25 $\frac{16}{100}$	
1881...	170,764	54,128	31 $\frac{13}{100}$	
1882	187,339	53,598	28 $\frac{60}{100}$	Spoon Dredges and Stone-lifters.
	9,429	13,254	\$1.40 $\frac{60}{100}$	Elevator Dredges.
	196,768	66,852	33 $\frac{88}{100}$	Totals and average.
1883	36,358	17,956	49 $\frac{38}{100}$	Spoon Dredges and Stone-lifters.
	6,990	19,385	\$2.77 $\frac{30}{100}$	Elevator Dredges—lifting rock and boulders and clearing up.
	43,348	37,341	86 $\frac{14}{100}$	Totals and average.
1884...	125,648	49,468	39 $\frac{37}{100}$	Spoon Dredges and Stone-lifters.
1885...	64,494	28,563	41 $\frac{10}{100}$	" " "
1886...	57,728	25,772	44	" " "
1887...	36,993	23,259	62	" " "
1888	73,150	36,690	50 $\frac{16}{100}$	" " "
	2,077	1,333	64 $\frac{18}{100}$	Elevator Dredges.
	75,227	38,023	50 $\frac{54}{100}$	Totals and average.
1889	205,283	54,574	26 $\frac{58}{100}$	Spoon Dredges and Stone-lifter.
	9,420	2,996	31 $\frac{80}{100}$	Elevator Dredge.
	214,703	57,570	26 $\frac{81}{100}$	Totals and average.
1890...	187,670	\$53,674	28 $\frac{60}{100}$	Spoon Dredges and Stone-lifter.

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The cost and character of the dredging done in the different parts of the harbour last year are as follows. All the quantities are scow measurements, and the cost includes towing and unloading the material:—

Section 6 (Windmill Point).—A little dredging was done in the basin where the deepening will be useful, but for the immediate purpose of obtaining stone for road foundations and other wharf repairs; depth of water 25 feet; quantity dredged, 720 cubic yards; material, shale rock; cost, 55 cents per yard.

Sec. 42 and 43 (Hochelaga).—Dredging was done for the foundation of cribs and for clearing away shoals in front of the new wharves, as already described under the head of new works. Depth of water, 30 to 33 feet; quantity dredged, 24,345 cubic yards; material, sand and hard silt with stones; cost, 36½ cents per yard.

Sec. 45 and 46 (Maisonneuve).—The dredging at Maisonneuve is for the formation of the new pier and basin, already described under the head of new works, and in this is comprised four-fifths of all the dredging done during last year. Depth of water, 29 to 35 feet; quantity dredged, 162,213 cubic yards; material, sand, tough silt and stones; cost, 25¾ cents per yard.

Ship Channel Through Harbour.—The work consisted of removing boulders from shoal places in the current St. Mary, by means of a stone-lifter. Several causes conspired to make the work tedious and costly in proportion to the area covered, and still more so when measured by the cubic yards of boulders lifted. The principal part of the work was in the swiftest part of the current where it runs at about seven miles per hour. The equipment of the stone-lifter was of inadequate strength for so strong a current and frequently broke, the stones were few, of a small size and scattered over a considerable area.

Quantity of boulders lifted, 392 cubic yards, costing an average of \$6.98 per yard.

Appended are tables giving further particulars as to the dredging plant and work done.

Yours respectfully,

JOHN KENNEDY,

Chief Engineer.

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HARBOUR DREDGING—Abstract of work done by each Dredge in the Harbour of Montreal in 1890.

VESSELS.	PLACES AT WHICH DREDGES WORKED.	Time of Service.		Quantities Dredged. Cubic Yards.			CHARACTER OF SOIL.
		Days.	Total Days.	Spoon Dredges.	Stone Lifter.	Total.	
Spoon Dredge No. 4.	Section 45 and 46, Maisonneuve	157	157	63,067		63,067	Sand, tough silt and stones.
Do. do No. 6.	“ 6, Windmill Point	4		720			Shale rock.
	“ 45 and 46, Maisonneuve	178	182	68,130		68,850	Sand, tough silt and stones.
Do. do No. 7.	“ 41 and 42, Hochelaga	90		24,345			Sand and hard silt with stones.
	“ 45 and 46, Maisonneuve	86	176	31,005		55,350	Sand, tough silt and stones.
Stone-Lifter, No. 2	Current St. Mary	80½			392		} Boulders.
	Section 45 and 46, Maisonneuve	1	81		11	403	
Total			596	187,267	403	187,670	

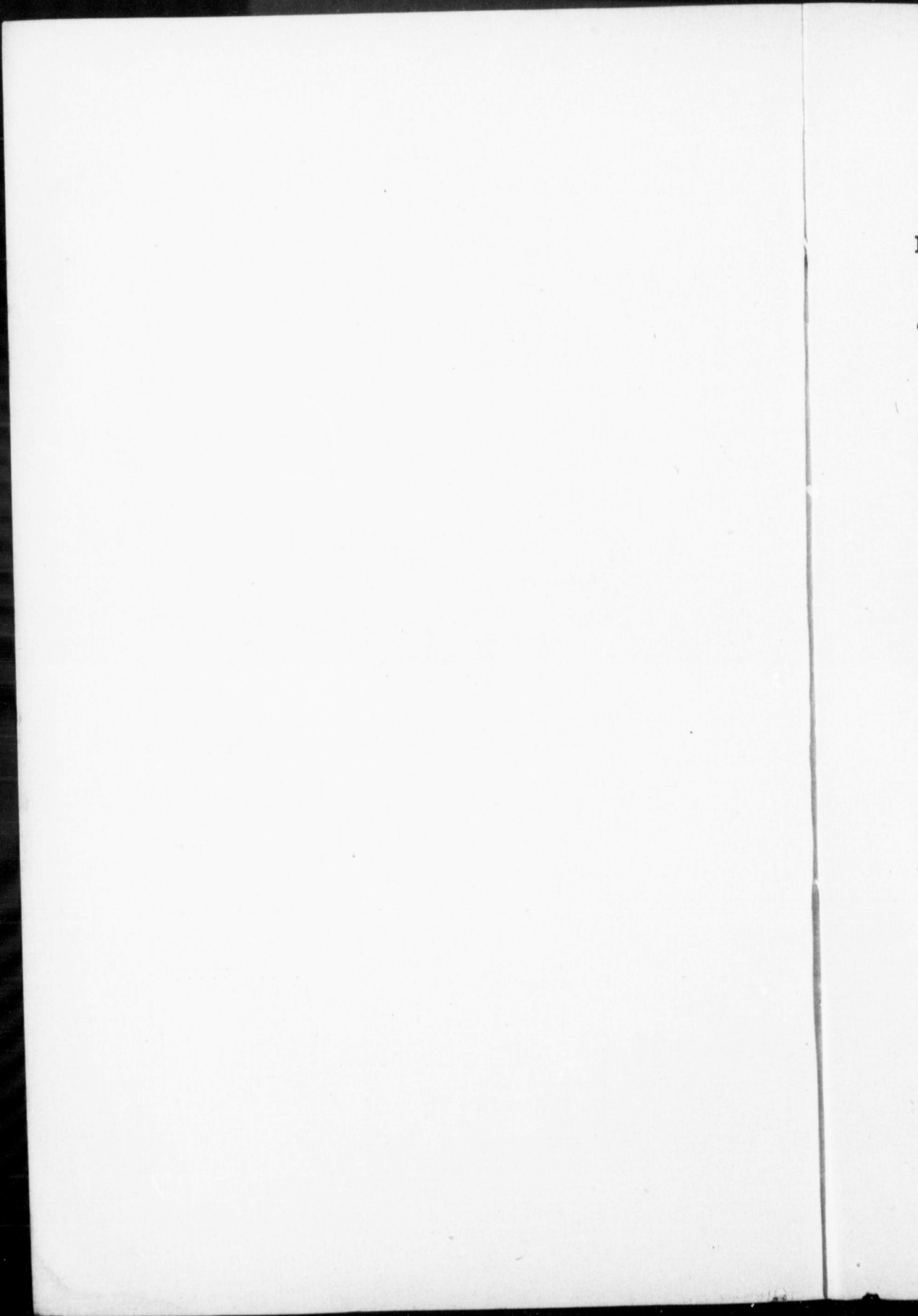
HARBOUR DREDGING—Statement showing the number of days worked by each Dredge and the quantity dredged at each place in 1890.

PLACES AT WHICH DREDGES WORKED.	VESSELS.	Time of Service.		QUANTITIES DREDGED.			CHARACTER OF SOIL.
		Days.	Total Days.	Spoon Dredges.	Stone-lifter.	Total Cubic Yards.	
Section 6, Windmill Point	Dredge No. 6.....	4	4	720	.....	720	Shale Rock.
" 41 and 42, Hochelaga.....	" No. 7.....	90	90	24,345	.....	24,345	Sand and hard silt, with stones.
" 45 and 46, Maisonneuve.....	" No. 4.....	157	.....	63,067	.....	.....	Sand, tough silt and stones.
	" No. 6.....	178	.....	68,150	.....	.....	" "
	" No. 7.....	86	.....	31,065	.....	.....	" "
	Stone-lifter No. 2.....	421½	421½	.....	11	162,213	Boulders.
Current St. Mary.....	" ".....	80½	80½	.....	392	392	"
Totals.....	.....	.....	596	187,267	403	187,670	

HARBOUR COMMISSIONERS' DREDGING PLANT EMPLOYED IN THE HARBOUR OF MONTREAL IN 1890.

DESCRIPTION OF VESSEL	HULL.			ENGINES.				REMARKS.	
	Length over all.	Breadth of Beam.	Depth of Hold.	Kind of Engine.	No. of Cylinders.	Diameter of Cylinders.	Length of Stroke.		Pressure of Steam.
	Ft. In.	Ft. in.	Ft. in.						
DREDGES.									
Boom Scoop Dredge, No. 4	77.3	27.0	6.6	1872	1	14	16	60	
“ “ “ No. 6	77.0	27.0	7.6	1874	1	14	16	90	
“ “ “ No. 7	77.3	27.0	7.0	1874	1	14	16	60	
DERRICKS.									
Clam Shell Derrick, No. 1	56.8	23.9	5.9	1872	1	8	12	75	
“ “ “ No. 2	57.0	23.6	5.9	1872	2	7	12	75	
“ “ “ No. 3	61.9	24.0	5.9	1875	1	10	12	75	
TUG BOATS.									
Tug St. Louis.....	67.0	15.0	8.7	1875	1	16	20	85	
“ “ St. Peter.....	71.6	16.6	8.6	1875	1	20	22	90	
BARGES.									
Staghound, (floating shop)..	103.4	21.5	7.6	1869					
A. G. Nish (coal barge)....	100.8	22.6	6.4	1873					
SCOWS.									
Sounding Scow.....	70.6	18.0	5.0	.....				
Flat Scow (old).....	70.6	18.3	5.0	.....				
“ “ “ No. 5	70.5	18.3	5.4	1873					
“ “ “ No. 6	70.5	18.0	5.0	1873					
“ “ “ No. 7	70.4	18.0	5.4	1873					
“ “ “ No. 10	70.4	18.1	5.4	1874					
“ “ “ No. 11	70.0	18.3	5.1	1874					
“ “ “ No. 14	69.5	18.4	5.0	1875					
“ “ “ No. 15	70.4	18.2	5.0	1875					
“ “ “ No. 16	70.4	18.3	5.6	1875					
“ “ “ No. 17	75.0	20.2	6.0	1876					
“ “ “ No. 18	75.4	20.4	6.3	1876					
“ “ “ No. 19	75.6	20.3	6.5	1878					
“ “ “ No. 20	75.6	20.3	6.3	1878					

In addition to the above there were borrowed from the Department of Public Works, for use in the Harbour in 1890, Stone-lifter No. 2, and three large dumping scows.



TARIFF.

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

*Under and by virtue of the Acts, 40 Vic., Cap. 53, 42 Vic., Cap. 28,
and 51 Vic., Cap. 5.*

ON AND AFTER THE TWENTY-THIRD DAY OF MAY, 1888.

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 one Ton.	Horses	2 to one Ton.
Apples, Flour, Meal, Potatoes 9 " "		Neat Cattle	3 " "
Fish, Meats, Pitch, Tar	7 " "	Sheep	15 " "
		Swine	10 " "

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

PRIVY COUNCIL OFFICE,
OTTAWA, 1st April, 1881.

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.*

Certified,

ALEXANDER ROBERTSON,
Secretary.

HARBOUR COMMISSIONERS' OFFICE,
MONTREAL, 23rd May, 1888. }